Sample Proposal of Research Project

2019-2020

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

MEERUT

STUDY OF ANEMIA IN HYPOTHYROID PREGNANT FEMALES

Research Proposal Submitted

By

Dr. POONAM MANI

Department of Obstetrics & Gynaecology Subharti

INTRODUCTION

Anemia is one of the most commonly encountered medical disorders during pregnancy. In developing countries, it is a cause of serious concern as, besides many other adverse effects on the mother and the fetus it contributes significantly high maternal mortality. According to United Nation declaration 1997, anemia is a major public health problem that needs total elimination. It is estimated that globally two billion people suffer from anemia or iron deficiency.

PREVALENCE OF ANEMIA IN PREGNANCY: According to World Health Organization estimates, up to 56% of all women living in developing countries are anemic. In India, National Family Health Survey in 1998 to 99 shows that 54% of women in rural and 46% women in urban areas are anemic. The relative prevalence of mild, moderate, and severe anemia are 13%, 57% and 12% respectively in India (ICMR data).

According to WHO, hemoglobin level below 11gm/dl in pregnant women constitutes anemia and hemoglobin below 7gm/dl is severe anemia. The Center for Disease Control and Prevention (1990) defines anemia as less than 11gm/dl in the first and third trimester and less than 10.5gm/dl in second trimester. Serum Ferritin less than 15 micro gm/L is associated with iron deficiency anemia.[1]

Iron deficiency and iron-deficiency anemia are global health problems and common medical conditions seen in everyday clinical practice. Although the prevalence of iron-deficiency anemia has recently declined somewhat, iron deficiency continues to be the top-ranking cause of anemia worldwide, and iron-deficiency anemia has a substantial effect on the lives of young children and premenopausal women in both low-income and developed countries.*[2] Iron-deficiency anemia remains the top cause of anemia, as confirmed by the analysis of a large number of reports on the burden of disease in 187 countries between 1990 and 2010[3]

and by a survey on the burden of anemia in persons at risk, such as preschool children and young women. Prevention programs have decreased rates of iron-deficiency anemia globally; the prevalence is now highest in Central and West Africa and South Asia.[4] The estimated prevalence of iron deficiency worldwide is twice as high as that of iron-deficiency anemia. The reported prevalence of iron deficiency in the absence of dietary fortification is approximately 40% in preschool children, 30% in menstruating girls and women, and 38% in pregnant women.[4,5]

In woman with iron deficiency anemia, thyroxine (T_4) and tri-iodothyronine (T_3) concentrations are reduced. Iron deficiency anaemia reduces the activity of thyroid peroxidase (an Iron dependent enzyme). In pregnant woman iron deficiency has been shown to predict low thyroxine and high TSH.[6]

Pregnancy also has a profound impact on the thyroid gland and thyroid function. The gland increases 10% in size during pregnancy in iodine-replete countries and by 20%- 40% in areas of iodine deficiency. Production of thyroxine (T_4) and tri-iodothyronine (T_3) increases by

50%, along with a 50% increase in the daily iodine requirement. These physiological changes may result in hypothyroidism in the later stages of pregnancy in iodine-deficient women who were euthyroid in the first trimester. The range of thyrotropin (TSH), under the impact of placental human chorionic gonadotropin (hCG), is decreased throughout pregnancy.

10- 20% of all pregnant women in the first trimester of pregnancy are thyroid peroxidase (TPO) or thyroglobulin (Tg) antibody positive and euthyroid. 16% of the women who are euthyroid and positive for TPO or Tg antibody in the first trimester will develop a TSH that exceeds 4.0 mIU/L by the third trimester, and 33%-50% of women who are positive for TPO or Tg antibody in the first trimester will develop postpartum thyroiditis. In essence, pregnancy is a stress test for the thyroid, resulting in hypothyroidism in women with limited thyroidal

reserve or iodine deficiency, and postpartum thyroiditis in women with underlying Hashimoto's disease who were euthyroid prior to conception

According to Guidelines of the American Thyroid Association for the Diagnosis and Management of Thyroid Disease During Pregnancy and Postpartum the following reference ranges are recommended: first trimester, 0.1-2.5 mIU/L; second trimester, 0.2-3.0 mIU/L; third trimester, 0.3-4.0 mIU/L.[7]

Thyroid hormones affect hematopoiesis. Among patient with hypothyroidism, normocytic normochromic anaemia is relatively common, which is due to decrease in red blood cell mass and hypo proliferation of euthyroid progenitors. thyroid hormones may affect hematopoiesis through an increase in erythropoietin production or hematopoietic factors by non euthyroid cells. iron deficiency anaemia has been reported in patients in hypothyroidism or sub clinical hypothyroi dism.[8]

Therefore, in the study, we shall investigate anemia in hypothyroid pregnant females, since these two are closely interlinked.

AIMS & OBJECTIVES

- To establish the prevalence and type of anemia in hypothyroid pregnant females using the appropriate statistical analytical tools.

MATERIAL & METHODS

This is a prospective analytical study which will be conducted in the department of Obstetrics and Gynaecology, Chhatrapati Shivaji Subharti Hospital / Subharti Medical College, Meerut, Uttar Pradesh over a period of 2 years after clearance from the ethical committee of the institution.

INCLUSION CRITERIA

All antenatal hypothyroid females will be included in the study. The cut-off for hypothyroidism are as follows:

- First trimester: 0.1-2.5 mIU/L;
- Second trimester: 0.2-3.0 mIU/L
- Third trimester: 0.3-4.0 mIU/L

EXCLUSION CRITERIAS

Patients with the following diseases will be excluded from the study :

- Pre pregnancy menstrual irregularities
- Cardiovascular disease
- Chronic kidney disease
- Chronic liver disease
- Haemorrhoids, or other diseases with gastro intestinal bleeding
- Chronic disease - Tuberculosis, Diabetes Mellitus, uncontrolled hypertension
- Haemoglobinopathies
  Malignancy

- Bleeding disorders
- Nutritional deficiencies

The patients will be informed about the study protocol and informed consent will be taken before participation in the study.

We will evaluate all antenatal patients for the clinical profile including the obstetric history and detailed examination.

Routine investigations will be done including hemoglobin, blood group, routine urine examination, viral markers (HbsAg, HCV, HIV) , RBS and thyroid screening by serum TSH than based on trimester specific TSH values hypothyroid females will be included in the study. They will be further investigated by GBP and serum ferritin for type the type of anemia and these females will be divided into two groups- Hypothyroid anemic females and hypothyroid females with no anemia.

The thyroid status of these patients will be established with the biochemical parameters of Thyroid Stimulating Hormone (TSH) levels. The hypothyroid antenatal females will be included in the study.

The prevalence of anemia as established by the hemoglobin levels will be studied in these patients. The type of anemia will be established by the peripheral smear / general blood picture. The correlation of anaemia in hypothyroid pregnant females will be established and the result will be subjected to appropriate statistical analysis.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 11/11/2021

Head of Department Dr. Mamta Tyagi

Name of Department: Department of obstetrics & gynaecology

Name of College: Subharti Medical college.

Findings of the project: (Max-100 words):

Study concludes that Prevalence of anemia in hypothyroid women were 69.5%. with dimorphic anemia being the most common. Treatment with thyroxine significantly improves anemia with hypothyroidism & pregnancy outcomes.

External Support: Himalayan Bauddh Darshan Shodh Sansthan

—

Name of PI: Dr. Poonam mani

Name of the Department: Department of obstetrics & gynaecology.

Name of College: Subharti Medical college

Title of the Project: To study of Anemia in hypothyroid pregnant females

Duration of the Project: 2years

Employee Code

Signature of P.I.

Registrar
Swami Vivekanand
Subharti University
MEERUT

COMPARATIVE EVALUATION OF INTRATHECAL FENTANYL VERSUS TRAMADOL AS ADJUVANT IN SUBARACHNOID BLOCK WITH HYPERBARIC 0.5% BUPIVACAINE IN PATIENTS UNDERGOING INFRAUMBLICAL SURGERIES

Research Proposal Submitted

by

Dr. PRAVESH SINGH

ANAESTHESIOLOGY & CRITICAL CARE

INTRODUCTION

Regional anesthetic techniques are more prefered over general anesthesia due to advantages of less chance of aspiration, airway compromise, good quality of postoperative analgesia. It is also beneficial in some pre-existing medical conditions. Spinal anesthesia is unparalleled in the way that a small mass of drug, virtually devoid of systemic pharmacologic effect, can produce profound, reproducible surgical anesthesia.[1]

Subarachnoid block is widely used regional anesthetic technique, particularly advantageous for infraumblical surgeries. Dural puncture is performed below the level of second lumbar vertebrae to avoid damage to the spinal cord which terminates at lower border of L1. The distribution of local anesthetic solutions within the subarachnoid space determines the extent of the neural blockade produced by spinal anesthesia. Disadvantages of subarachnoid block are due to sympathetic blockade which causes hypotention, bradycardia and decreased cardiac output. These effects are generally proportional to the level of sympathetic blockade. Low spinal anesthesia, a block below T-10, carries a different physiologic impact than does a block performed to produce higher spinal anesthesia (higher dermatome than T-5).

Local anaesthetics are among the different class of pharmacological compounds used for regional anesthesia. These drugs are able to reversibly block the excitation-transmission process in axon, of relatively short duration of action but may cause toxicity to the central nervous and cardiovascular systems. The versatility of spinal anesthesia is afforded by a wide range of local anesthetics which includes lidocaine, bupivacaine, etidocaine, mepivacaine, prilocaine, ropivacaine and levobupivacaine. Among all available local anesthetic agents for intrathecal

administration, 0.5% hyperbaric bupivacaine has become increasingly popular as it provides sensory and motor blockade for longer duration and is appropriate for surgeries lasting for 2-2.5 hours.

Several adjuncts such as opioids and alpha-2 agonist have been used with local anesthetics to control the surgical level of anesthesia, onset and the duration of spinal anesthesia, sedation, stable hemodynamics and their ability to provide smooth and prolonged post operative analgesia.[2]

The addition of opioids to local anesthetics is very commonly practiced to provide effective postoperative analgesia, to reduce toxicity and unwanted cardiovascular effects of local anesthetics by allowing dose reduction of local anesthetic. Anti-nociceptive synergism between local anesthetic and intrathecal opioids has been demonstrated in various animal studies. But this combination of local anesthesia with opioids may lead to undesirable problems of itching, nausea and vomiting and / or respiratory depression.[3]

The Fentanyl is a short-acting lipophilic opioid which stimulate (μ1) and (μ2) opioid receptors. Stimulation of these receptors on central nervous system neurons leads to hyperpolarization of the cell membrane potential and suppression of action potential transmission of ascending pain pathways. It is used as parenterally for management of moderate-to-severe pain or as a supplement for balanced general anesthesia.[4]

Fentanyl acts primarily as agonist at (μ) opioid receptors to produce primary analgesic activity. Like other opiates, it produces supra-spinal analgesia, it also acts on kappa and delta receptors to enhance spinal analgesia.

Tramadol is synthetic 4-phenyle-piperidine analogue of codeine, is a racemic mixture of two enantiomers, with synergistic anti-nociceptive interaction. The (+) enantiomer has moderate affinity for the opioids (μ) receptor and inhibits serotonin uptake, and the (-) enantiomer is a potent norepinephrine synaptic release inhibitor.[5]

Stimulation of μ opioid receptors on central nervous system leads to hyperpolarization of the cell membrane potential and suppression of action potential transmission of ascending pain pathways. It enhances the function of the spinal descending inhibitory pathways by inhibition of neuronal reuptake of norepinephrine and serotonin as well as presynaptic stimulation of 5-hydroxytryptamine release, resulting in anti-nociceptive effect. Tramadol is useful because of its cost effectiveness, easy availability and lesser side effects. Reports showed that intrathecal subarachnoid tramadol can provide postoperative analgesia, but may lead to undesirable effects of pruritus, respiratory depression, nausea and vomiting. [6]

Search is still on for an ideal intrathecal adjunct which can improve the quality of block with desirable duration of effect extending to postoperative period. The ideal adjuvant should have minimum side effects in term of haemodynamic changes, motor blockade, systemic or cardiac toxicity and respiratory depression.

The present prospective randomized double blind clinical study is designed to comparatively evaluate the clinical efficacy and safety of intrathecal fentanyl versus tramadol as adjuvant to hyperbaric 0.5% bupivacaine in subarachnoid block in patients undergoing infraumblical surgeries.

AIMS AND OBJECTIVES

The aim of this prospective double blind randomized clinical study is to comparatively evaluate the clinical efficacy and safety of intrathecal Fentanyl versus Tramadol as adjuvant to hyperbaric 0.5% Bupivacaine in subarachnoid block in infraumblical surgeries. The effect of Fentanyl and Tramadol on subarachnoid block characteristics will be assessed with the following objectives-

I. Primary objectives:

1. To evaluate and compare the onset and duration of sensory blockade after intrathecal 0.5% hyperbaric bupivacaine with fentanyl or tramadol.
2. To evaluate and compare the onset and duration of motor blockade after intrathecal 0.5% hyperbaric bupivacaine with fentanyl or tramadol.
3. To evaluate and compare the time taken for two dermatome sensory regression to T10 after intrathecal 0.5% hyperbaric bupivacaine with fentanyl or tramadol.
4. To compare the duration of postoperative analgesia between both the groups.

II. Secondary objectives

1. To evaluate and compare the hemodynamic changes of systemic blood pressure, heart rate and SpO2 in patients of both the groups.
2. To evaluate and compare the level of sedation on Ramsay sedation scale in patients of both the groups.
3. To observe any side effects due to fentanyl, tramadol and bupivacaine during the study period.

MATERIAL AND METHODS

Study Design

The present prospective double blind randomised study will be conducted at the Department of Anaesthesiology and Critical Care, Chhatrapati Shivaji Subharti Hospital associated to Subharti Medical College, affiliated to Swami Vivekanand Subharti University, Meerut, on 60 adult patients who will be scheduled for elective infraumblical surgeries under intrathecal subarachnoid block, after approval from Institution Ethical Committee.

Duration of Study

The study will be conducted over a period of 12 months from July 2019 to June 2020.

Selection criteria

All enrolled patients shall undergo the pre-anesthetic checkup which will include a detailed medical and surgical history, current and past medications with any previous anesthetic exposure. Physical examination will evaluate the general condition, built, weight, presence of cyanosis, pallor, anemia, clubbing, jaundice or peripheral edema, heart rate, systemic blood pressure and respiratory rate. The spine will be examined for any infection over skin, especially at puncture site or any spinal deformity.

The systemic examination shall be performed to rule out any cardiovascular, respiratory, gastrointestinal, metabolic, neurological, bleeding disorder or any other systemic illness. Airway examination will include Mallampati grading, mouth

opening along with dental status, thyromental distance and jaw protrusion along with flexion and extension at neck.

Routine biochemistry investigations shall include routine urinary analysis, hematocrit levels, total leucocyte count, differential leucocyte count, blood sugar, blood urea, serum creatinine, bleeding time and coagulation profile. Electrocardiography (ECG), X- Ray chest/ Lumbar spine or any other relevant investigation will be done in patients where indicated.

Inclusion Criteria

Patients scheduled for elective infraumblical procedures under spinal anesthesia will be enrolled for the study with following criteria-

1. Patients of either sex,
2. Age between 18 to 58 years,
3. ASA physical status I and II,
4. Average weight between 50 to 80 kg.

Exclusion criteria

1. Patients with physical status of ASA III or greater.
2. Patients with history of severe cardiac or pulmonary disease, poorly controlled hypertension.
3. Morbidly obese patients, neurologic or psychological disease, hepatic or renal dysfunction, endocrinal or metabolic disorders.
4. Deformity/Abnormality of spinal column.
5. Bleeding or coagulation disorder.

6. Known hypersensitivity to study drugs or using any drug that modifies pain perception.
7. Infection at site of lumbar puncture.
8. Un-cooperative patient.
9. Refusal to technique or enrolment for study.

Informed Consent

A written informed consent will be obtained from all the selected patients in a predesigned consent form in a language of the patient and his relatives fully understand. The patients will be explained the procedure and the duration of the study. They will be well informed that participation is voluntary and that they can withdraw anytime from the study.

Sample Size

Preliminary sample is decided in consultation with statistician and is based on previous studies, which indicated that approximately 30 patients shall be included in each group in order to ensure power of 80% and alpha error of 0.05 with confidence limit of 95% for detecting clinically meaningful difference in duration of postoperative analgesia. Assuring a 5% drop out rate and for equal distribution of patients in both groups, a total 60 patients will be incorporated in the study for better validations of results.

Randomization and Blinding of Study groups

The total 60 adult consented patient will be divided into two equal group of 30 patients each, according to computer generated random number table:

Group I-(BF)(n=30)-Patient will be receiving intrathecal 3.5 ml of 0.5% hyperbaric bupivacaine (17.5 mg) with 0.5 ml of fentanyl (25 mcg).

Group II-(BT)(n=30)-Patient will be receiving intrathecal 3.5 ml of hyperbaric bupivacaine (17.5 mg) with 0.5 ml of tramadol (25 mg).

The total volume of drugs will be 4 mL for both groups. The study drug preparation shall be done by resident anaesthesiologist to keep the blindness of study. He will not be involved further in the study to collect the data.

Anesthetic technique

Pre-anesthetic evaluation of the patients will be done before surgery with their clinical history, physical examination and routine investigations. All patients will be admitted prior to day of surgery and atleast 6 hours fasting.

On arrival to operation theatre, routine monitoring will be commenced and baseline vital parameters of heart rate, non-invasive arterial pressure including systolic, diastolic and mean arterial pressure cycled at 3 minutes interval, peripheral oxygen saturation (SpO2) and electrocardiogram (ECG) will be recorded. An intravenous line with 18 G or 20 G will be secured in non - dominant forearm and will be preloaded with lactated Ringer's solution at the rate of 10 mL/kg, over 15 minutes before the initiation of subarachnoid block. All patients will be explained in detail about the procedure of giving subarachnoid anesthesia and will be instructed on the methods of sensory block and motor block assessments.

The subarachnoid block will be carried out under all aseptic precaution. Patient will be asked to sit on the operating table with elbow resting on thighs. The skin of back will be cleaned with savlon (5%) followed by iodine-containing sterilizing solution, giving contact time of 5 minutes. Thereafter back will be prepared

with alcohol containing solution and will be draped with sterile sheets. The operator will take full sterile precautions, including wearing the mask, gown, and gloves.

In the well positioned patient, the L3 L4 intervertebral space will be identified using Tuffier's line as a bony landmark and a 25 G Quincke's spinal needle will be introduced in the space through midline approach. After confirmation of correct placement of needle by free flow of spinal fluid from needle, 4 ml of study drug solution will be injected slowly over 0.1-0.2 ml/sec in selected groups. Immediately after completion of the injection, patients will be made to lie down supine.

After injection of drug in the subarachnoid space, the following parameters will be monitored and recorded:-

a) **Hemodynamic Changes:** Heart rate, blood pressure (systolic blood pressure, diastolic blood pressure), SpO_2 at every 3 min interval till 30 minutes, thereafter at 5 min intervals up to the end of surgery and then every 15 minutes postoperatively. For the present study hypotention will be defined as systolic arterial pressure of less than 100 mm Hg and will be treated primarily by increasing the intravenous crystalloid infusion rate and additionally with mephentermine 6 mg IV if required. Bradycardia is defined as heart rate < 60 beats per minute and shall be treated with intravenous atropine 0.6 mg IV.

b) **Complete Sensory Block:** It is the time interval between the end of administration of study drug and the onset of cutaneous analgesia at T10. The segmental level of sensory block will be assessed by pin prick method bilaterally along the mid clavicular line by using short bevelled 26 G hypodermic needle after cleaning with spirit swab, at every 2 minutes

from the time of administration of drug. Trendelenberg tilt of table to 10 degree will be done to achieve the blockade up to the T8 segment and then the table will be straightened and surgical incision will be allowed.

The surgical anesthesia will be considered when at least T10 dermatome level is anesthetized. Postoperatively the sensory and motor block levels will be assessed at 15 minutes interval until normal sensations are returned.

c) **Degree of motor block:** The motor block of the lower extremities will be evaluated bilaterally at every 2 minutes after administration of drug intrathecally till the time of complete motor block using by ***Modified Bromage Scale:***

0=full movement and able to raise straight leg against resistance

1=unable to raise extended leg at the hip but able to flex the knee

2=unable to flex the knee but able to move the ankle joint

3=unable to move hip, knee or ankle (no motor activity)

d) Sedation scores will be evaluated by **Ramsay Sedation Scale** at every 10 minutes considering the time of giving the study drug as zero.

Ramsay Sedation Scale:

1= Patient anxious, agitated or restless

2= Patient co-operative, oriented and tranquil alert

3= Patient respond to commands

4= Asleep but arousable with brisk response

5= Asleep with sluggish response

6= Asleep with no response

e) **Adverse effects intraoperatively and their treatment:** Adverse effects like anxiety, nausea, vomiting, dry mouth, dizziness, respiratory depression i.e. SpO2 <95% with or without respiratory rate < 10 breaths/min, pruritus, shivering will be recorded. These adverse effects will be managed as follows:-

Anxiety- Inj. Midazolam, Vomiting- Inj. Ondansetron, Respiratory depression- Oxygen by facemask, Pruritus- Inj. Pheniramine, and Shivering- Inj. Dexamethasone.

Visual analogue scale (VAS)

VAS is a psychometric response scale which will be used for postoperative pain assessment. When patients responding to VAS, they will specify their level of agreement to a statement by indicating a position along a continuous line between two end points of 0-10, where 0 means no pain and 10 means worst possible pain.

After the end of the procedure patient will be shifted to the recovery room and monitored for vital signs and VAS every 15 minutes for the 1st hour and then every 30 minutes. Rescue analgesia will be given with inj. Diclofenac sodium 75 mg intramuscularly when VAS >4.

Statistical Analysis

The data obtained in the study will be presented in a tabulated manner and will be expressed as Mean and SD (standard deviation), considering the later as best predictor for statistical analysis. Data will be analyzed using Stat Graphic Centurion, (version 16). The demographic data for categorical variables will be compared using chi square test. Statistical significance in mean difference between groups will be

compared using Student t' test. Block characteristics will be compared using Kruskal Wallis H test. P value < 0.05 will be considered statistically significant.

1. PROFORMA

1. *Demographic data*

Name- Age/sex- Date- Weight-

Height- ASA(I/II)- Reg no- Group I/II-

2. Type of Surgery- ***3. Duration of Surgery-***

4. Subarachnoid block given at L3-4 level

Characteristics of block	**Time (min)**
Onset of complete sensory block	
Maximal cephalic dermatome level	
Onset of complete motor block	
Duration of motor block	
Total time taken for two segment sensory regression to T10	
Total duration of sensory analgesia	

5. Hemodynamic and Respiratory parameter at different time intervals

Time	SBP/DBP (mmHg)	MAP (mmHg)	HR (beats/min)	RR (breath/min)	SpO2
Baseline					
After SA block					
3 min					
5 min					
7 min					
10 min					
15 min					
20 min					
30 min					
40 min					
50 min					
60 min					
70 min					
80 min					
90 min					
Post-op					

6. Sedation score (after 30 min)-
7. VAS -
8. Any side effects –
9. Treatment given-

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Date: 12.03.2021

Name of Department: Anaesthesiology & Critical Care

Name of College: Subharti Medical College, Meerut

Findings of the project: (Max-100 words): This study was conducted on 60 patients undergoing infraumbilical surgeries under subarachanoid block. Group 1 patients were given intrathecal 3.5ml of 0.5% hyperbaric bupivacaine with 0.5ml of fentanyl (25mcg) and group 2 patients were given intrathecal 2.5ml of 0.5% hyperbaric bupivacaine (17.5mg) with 0.5ml of tramadol (25mg)

This study concluded that intrathecal fentanyl in dose of 25mcg as intrathecal adjuvant to hyperbaric bupivacaine led to faster onset and prolonged duration of sensory and motor block when compared with tramadol (25mg). The quality of analgesia was better with fentanyl when compared to tramadol.

External Support:

Supported from G. S. Formulation

Name of PI: Dr. Pravesh Singh

Name of the Department: **Anaesthesiology & Critical Care**

Name of College: **Subharti Medical College, Meerut**

Title of the Project: **Comparative evaluation of intrathecal fentanyl versus tramadol as adjuvant in subarachnoid block with hyperbaric 0.5% bupivacaine in patients undergoing infraumbilical surgeries.**

Duration of the Project: **18 Months**

Registrar
Swami Vivekanand
Subharti University
MEERUT

A study to evaluate the effectiveness of reminiscence therapy in terms of psychological well-being among senior citizens resident of selected community at Meerut

Research Proposal Submitted

By

Dr. Geeta Parwanda

Faculty of Nursing

6.0	**BRIEF RESUME OF THE INTENDED WORK**
6.2	

INTRODUCTION

"Beautiful young people are accidents of Nature,but beautiful old people are works of art".

-" Eleanor Roosevelt".

Jonathan Swift. "Quoted that every man desires to live long, but no man wants to be old." This maxim from m Jonathan Swift may help to explain why, even today, old age can take us by surprise. People often avoid thinking about their upcoming transition to "Senior citizen" and "retire" for so long that they fail to prepare for it. Inadequate financial planning can leave older people" newly poor" shortly after retirement and thus poor for the rest of their lives. In fact, while the elderly constitute about 10% of the U.S. Population, they constitute 20% of the poor in the United States. Like other age groups, the elderly like to have friends of their own age and recreation to enjoy with those friends. However, retirement communities that offer these attractions are mostly for the financially secure.

BACKGROUND OF STUDY

A silent revolution has occurred in the last 100 years unseen, unheard and yet so close. The biggest achievement of the century is longivity. All over the world, life expectancy has raised leading to a sharp rise in the number of older persons. Ageing is a universal, normal inevitable biological phenomenon. The society which fosters research to save human life cannot escape the responsibility for the life thus extended. Ageing is generally defined as a process of deterioration in the functional capacity of one individual that results from structural changes. India is growing older. The life expectancy has gone up from 20 years in the beginning of the 20^{th} century to 62 years today. Better medical care and low fertility have made the old the fast growing section of society. The stark reality of the ageing scenario in India is that there are 77 million older people today and the number is growing to rise 177 million in another 25 years.

Psychological well- being is about lives going well. It is the combination of feeling good and functioning effectively. Sustainable well- being does not require individuals to feel good all the time; the experience of painful emotions (e.g. disappointment, failure, grief) is a normal part of life, and being able to manage these negative or painful emotions is essential for long- term well- being. Psychological well- being is, however, compromised when negative emotions are extreme or very long lasting and interfere with a person's ability to function in his or her daily life.

The concept of feeling good incorporates not only the positive emotions of happiness and contentment, but also such emotions as interest, engagement, confidence, and affection. The concept of functioning effectively (in a psychological sense) involves the development of one's potential, having some control over one's life, having a sense of purpose (e.g. working towards valued goals), and experiencing positive relationships.

There is pressure on all aspects of care of the older persons-be it financial, health or shelter. With older people living longer, the households are getting smaller and congested, causing stress in joint and extended families. Even where there is co-residing marginalization, isolation and insecurity is felt among

the older persons due to the generation gap and change in life styles. Increases in life span also results in chronic functional disabilities creating a need for assistance required by the older person to manage chores as simple as the activities of daily living. With the traditional system of the lady of the house, looking after the older family members at home is slowly getting changed as the women at home are also participating in activities outside home and has their own career ambitions. There is growing realization among older persons that they are more often than not being perceived by their children as burden. As life expectancy increases, the size of a person entering a nursing facility at some point increases.

The mental health needs of older adults in health care settings are not being met. While close to 6% of the older adult populations resides in long term facilities, a very little active psychological treatment are available in these settings. The need to provide quality mental health care for elders in nursing home settings has been a critical issue, as the ageing population grows rapidly and institutional care becomes a necessity for the older people.

Each grey hair may be considered as the reservoir of knowledge and experience. The brightness of the grey hair reflects the vast and wide knowledge that a person acquired throughout his life. The eyes of old people can visualize the pros and cons of happening. Senior citizens are really the guides of the younger generation. It is our duty to make their evening, peaceful, pleasant and memorable. The United Nations had declared the year 1999 as the International year of the aged. It is the duty of the society to provide comfort, medical care and happiness to the old persons who are without family care. The lonely, desperate grandfathers and grandmothers really need our attention and care.

Haight and hendriix.(1998). **Michel and Hendrix.** (2000).**Cully, lavoie, and Gfellelr**.(2001).Reminiscence therapy is a nurse – initiated intervention that has the advantage of being cost-effective, therapeutic, social and recreational for the institutionalized older adult. As a communicative psychosocial process, reminiscence therapy has proven to be a valuable intervention for the depressed elderly client. The researcher's own experience and the related review has inspired and motivated the researcher to conduct the present study.

NEED FOR THE STUDY

The 21st century is often called the "age of ageing". One of the world's greatest challenges of the present century is the enormous increase in the absolute number and proportion of elderly in the world. According to the united nation's projections, by the year 2050, the number of older persons is expected to be more than three fourth, (ie) from 600 million to almost 2 billion. As per 2010 census, India has a populations of 1.15bilion. Out of this, the elderly constitutes 90 million or 9%.

Age wise data in census of India in 2010 indicates that India's ageing population is on the rise. In India, life expectancy has gone up from 20 years in the beginning of the 20th century to 62 years today.

WHO report in 2010 as estimated 524 million people were aged 65 or older 8% of the world's population between the years 2000 and 2050, the worldwide proportion of persons over 65 years of age is expected to more than double, from the current 6.9% to 16.4% around 60% of the 580 million of older people in the world live in developing countries and by 2020 this value will increase to 70% of the total older population.

The joint family of traditionally Indian set up respected elderly while nuclear families do not include the elderly. The family integration has isolated the elderly or forced them to reside in old age

home where standard of life is pathetically down. Rates of depression are high among the elderly, and suicide rates considerable higher than among younger adults.The growing population figure of elderly not only in India but also globally vastly increasing and that warrants more care and attention to be given to them.

Reasons for an increase in Old Age Homes

Increasing longivity, disintegration of the joint families, proliferation of nuclear families, migration of people to urban areas, apartment system of dwelling with limited space for lateral movements and growing employment in overseas have all been factors that are contributing to the mushrooming of old – age homes and shelters for the abandoned old people in the society. There are approximately 950 old age homes in India today. Kerala state has the highest number of old age homes (123) followed by Tamil Nadu state (115).

Aging is associated with poor mental health; especially high levels of gero – psychiatric disorders are major obstruction to health and quality of life in these elderly people. The health and quality of life of elderly people can be promoted through prompt problem recognition and prevention. Elderly people present an enormous challenge to the mental health care system. Statistics have shown a high rate of mental disorders, especially depression among the population group. Although depression is not necessarily associated with ageing and older age, a significant number of seniors do experience clinical level older age, a significant number of seniors do experience clinical level of depression. There is a higher rate of depression among patients with serious medical problems (25%).

It is seen that providing health services to the old people who live in the nursing home is very necessary and important. It is thought that evaluation of the spare time and planning of the social activities will affect the level of psychological well being in positive way.

As a general rule, non – pharmacologic treatment options for depression should always be available. Psychological treatments have been found effective with older adults. In particular, cognitive behavior therapy, interpersonal therapy, problem – solving therapy and Reminiscence therapy is one form of intervention that has been used to alleviate these psychological problems (Butter 2001). The incidence of psychiatric geriatric disorders in elderly residents in long term care is roughly 80% with depression being the most common emotional disorders (Jones & Beck – Little, 2002). Studies have examined the benefits of reminiscence for the elderly and concluded that reminiscence generally reduces depression and confusion. [(Haight & Hendrix, (2002); (Taylor-Price, 2003)]. Fry (2004) conducted a structured and unstructured reminiscence therapy to treat depression among the elderly and concluded that reminiscence therapy helped the depressed elderly to focus on meaning in past life events. One study conducted in Taiwan also showed the evidence of reminiscence to lessen the elderly depression level [Hsiao et al, 2003]. The maintenance of positive self image is important in helping people to deal with the negative impact of aging on their lives. Low levels of self esteem and self health perception are major among Taiwanese elderly (Wang et al, 2003).

6.3 STATEMENT OF THE PROBLEM

" A study to evaluate the effectiveness of Reminiscence therapy in terms of psychological well being among senior citizens at selected old age homes in Meerut."

6.4 OBJECTIVES OF THE STUDY

	➢ To assess the level of psychological well being among the senior citizens in selected old age homes. ➢ To evaluate the effectiveness of reminiscence therapy on psychological well being among the senior citizens in experimental group in selected old age homes ➢ To compare the psychological well being score between experimental group and control group. ➢ To associate the psychological well being score in experimental group with selected demographic variables.
6.5	**OPERATION DEFINITIONS** **Evaluate** • Evaluation is 'A process of judging the value or worth of an individual's characteristics obtained by measurement or assessment.' • In this study Evaluation refer to the assessment of psychological well beingRyff scale of psychological well being. **Effectiveness** • Effectiveness is 'The degree to which something is successful in producing a desired result; success'. • In this study, Effectiveness refers the outcome of the reminiscence therapy in which will be appraised by increase in psychological well being score. **Reminiscence therapy** • Refers to discussion of past pleasant memories, events and experiences with another person or group of people, with the help of tangible aids such as photographs, music and sound recording and other familiar items from the past. **Psychological well being** • **In this study Psychological well-being** consists of positive relationships with others, personal mastery, autonomy, a feeling of purpose and meaning in life, and personal growth and development.' **Senior Citizens** • Senior citizen is 'An elderly person, especially an old-age pensioner'. • In this study, it refers to the individual who are above 60 years of age living in selected old age homes. **Old age home** • It 'is a multi-residence housing facility intended for the elderly'. • In this study, it refers to an institution providing professional care to the elderly like their residential setting.
6.6	**RESEARCH HYPOTHESIS** H1- The mean post test psychological wellbeing scores of experimental group is significantly higher than the mean post test psychological well being scores of control group. H2- The mean post test psychological well being scores are significantly higher than the mean pre test psychological well being score of experimental group.

H3- There is a statistically significant association between pretest psychological well being scores with selected demographic variables in both control and experimental groups

6.7

ASSUMPTIONS

1. Majority of the senior citizens have a low level of psychological well being.
2. Reminiscence therapy assists the senior citizen to resolve conflicts, deals with past losses, recognize and appreciate inner resources and find meaning in the significant past life events.

6.8

DELIMITATIONS

1. The study was delimited to the senior citizens who are residing in selected old age homes at Meerut.
2. Data collected period will be delimited to 4 weeks.

6.9

CONCEPTUAL FRAMEWORK

The investigator adopted Modified Imogene King's Goal Attainment Theory (1981)

7

REVIEW OF LITERATURE

I.Studies related to psychological well being among senior citizens

(i)**Meire Cachioni' Lais Lopc (2017)**A cross sectional study was conducted to assess subjective and psychological well-being among elderly participants of a University of the Thailand..The study aimed to analyze the distribution of measures of subjective and psychological well-being according to demographic criteria and length of participation in the program.: a sociodemographic questionnaire (age, gender, education, length of participation in University of the Third Age (U3A) and similar programs located in the city of São Paulo, Brazil; an Overall Life Satisfaction Scale; a Life Satisfaction Scale that contemplated four domains: health, physical capacity, mental capacity and social involvement; a Positive/Negative Affect Scale; and a Personal Development Scale. The data were analyzed by the chi-squared test (for comparison of categorical variables), the Mann-Whitney and the Kruskal-Wallis U tests (for comparison of continuous variables).Results revealed that age and gender were the main factors that were significantly associated with overall life satisfaction, life satisfaction in specific domains, and morale. Higher education was associated with psychological adjustment.

(ii) A study was conducted to assess the quality of life, psychological well-being and depression among the elderly in an urban set up. The sample consisted of 120 subjects randomly selected from the urban population of Bhubaneswar. The method of sampling was stratified purposive sampling selecting 40 subjects each from the high, middle and low SES status groups. Kupuswamy's Socioeconomic Status Scale (adapted version) will be used to assess the SES status of the subjects. McGill Quality of Life Questionnaire consisting of 15 items each to be responded by the subjects on a 10 point scale. Ryffscale used for for psychological wellbeing .Beck's Depression Inventory consisting of 21 items will be used to measure the level of depression of the subjects. Result shows that the main effect of SES is found to be significant to suggest that among the urban elderly, SES is a major factor for determining their quality of life.It observed from the means that in high and middle SES groups, men have higher autonomy than

women . Autonomy of men decreases with decreasing status in SES while for women autonomy increases for middle and low SES groups. T he results of ANOVA show significant main effects of both gender and SES status and the interaction effect is not found significant. Hence it may be derived that in the population of urban elderly, women are given less autonomy and particularly among the high SES groups; women have less freedom and autonomy and SES status is negatively impacts mastery of the environment of the urban elderly population. it may be derived that personal growth as a psychological wellbeing among the urban elderly is significantly influenced by gender in favour of men. The level of depression of the subjects was also measured that vmost of the urban elderly have some level depression which range between mild mood disturbances to borderline depression.

(iii) **Ibitoye,Sanuade** .A study was conducted to examine the psychological well-being of the elderly in Ijumu local government area (LGA) of Kogi State Nigeria. A multi-stage sampling technique was adopted and 1,217 elderly aged 65 + were randomly selected. Psychological well-being was operationalized as whether the respondent experienced good or poor psychological well-being. Data were analysed using descriptive statistics, Chi Square tests and binary logistic regression. The mean age of the elderly was 72.3±8.4 years and a higher proportion (53.3%) experienced good psychological well-being. Age, level of education, current working status and financial assistance from children were the main determinants of good psychological well-being. Specifically, good psychological well-being decreased with increasing age. Also, the odds of having good psychological well-being was lower among those with no education and primary education compared with their counterparts with secondary education or more. Those who were currently working and who received financial assistance from children had better psychological well-being.

(iv) **Tandon Mahima (2016)** conducted a study to assess the level of psychological well-being among Elderly.The main purpose of this research was to assess the psychological well-being among the elderly. The study was carried out in Lucknow and the sample was selected following Multistage sampling technique. The sample for this study comprised 120 elderly individuals (60 females and 60 males respectively) comprising of elderly living in home and old age home. Psychological well-being scale developed by Sisodia and Choudhary (1999) was used to asses the psychological well-being level. This study revealed that there is a significant difference in psychological level found among the elderly living in the familes and old age home.

(v) .DoshiDhara R and Yogesh A Jogsan (2013) conducted a study to assess Depression and Psychological Well-being in Old age.The main purpose of this research was to find out the mean difference between adult and aged in depression and psychological well being. The total 60 sample were taken out which 30 were adult (20 to 59 years) male and female and 30 were aged (60 years and above) male and female. The research tool for depression, Beck depression inventory was used. Here Guajarati adaption used. For psychological well being, Sudha Bhogle's Psychological well being scale was used, translated in Gujarati and the t-test was applied to check the difference of depression and psychological well being and the Karl-person 'r' method used to check the correlation.Result reveals that significant difference in depression and psychological well being with respect to both adult and aged.

(vi) Singh Bhawana and Kiran U.V.(2013) conducted a study to assess psychological well being during old age. This study investigated the influence of psychological wellbeing on a sample of 200 elderly

comprisingof elderly from the old age homes, elderly living with family and elderly living alone. The sample was selected purposively from rural and urban areas of Lucknow district. Average age was 70-80 years with a range from 65 to 96. A self-structured questionnaire to examine the psychological well being of elderly was used. As hypothesised, there was a significant differences in psychological wellbeing among people living with family, in old age homes and living alone .

II. Studies related to reminiscence therapy

(vii). **Wulf (2011)** conducted a study to assess group integrative reminiscence as a nursing intervention to evaluate the immediate effects on self-esteem, life satisfaction and depressive symptoms for a special group named 'institutionalised older veterans' after a 12-week intervention.The study group comprised institutionalised older with combat experience, including being wounded in war and who were twice forced to relocate. The group participants had lower life satisfaction, and greater use for mental health services and greater non-specific health complaints were reported, from this group.A quasi-experimental design and purposive sampling were conducted.A total of 74 participants were studied with pre- and post-tests to measure the effect of group integrative reminiscence therapy. The activity was held once weekly for 12 weeks. The Life Satisfaction Index A, self-esteem scale and Geriatric Depression Scale Short Form were used as research tools, and the t-test, Fisher's exact test and generalised estimating equation were used for data analysis. After 12 weeks of intervention, the reminiscence groups significantly improved their self-esteem and life satisfaction and decreased depressive symptoms compared with control groups.The result shows Group integrative reminiscence revealed immediate effects on improving the self-esteem and life satisfaction of institutionalised older veterans, and depressive symptoms were also decreased. Moreover, a sense of positive self-value and belonging to the institution was produced.

(viii) Huang Song-Lin (2009) conducted a study on application of reminiscence treatment on older people with dementia: A case study in Pingtung, Taiwan". Reminiscence therapy has been utilized for many years in the treatment of dementia in older people. Purposes of the researches included examining different methods of promoting interactivity, social participation, and cognitive function improvements in those with dementia. This study used pretest and posttest electroencephalography measurements to test reminiscence therapy efficacy on participants. Findings and suggestions were the rising mini mental state examinations and reduction in depression scale scores, although noted, were not significant and self achievement emotional stability, family atmosphere, physical needs of participants were met. The authors recommends that reminiscence group work be promoted in the home for older persons.[18]

(ix) Yumimo Okumura (2008) "Effects of short-term reminiscence therapy on elderly with dementia: A comparison with everyday conversation approaches". Recent research has demonstrated the usefulness of reminiscence therapy as a psycho sociological approach to the care of the demented elderly. The present study conducted five therapy sessions using closed groups; mainly a verbal fluency task was used to assess the efficacy of therapy. In reminiscence group there was a significant increase in the number of words recalled at the end of 5th session compared with that recalled at the end of the 1st session. The study concludes reminiscence therapy performed over short period of time in closed groups was shown to be more effective than everyday conversation in treatment of elderly people with dementia. It is suggested that the effectiveness of reminiscence therapy should be ascertained not only by the verbal

fluency but also by changes in patient's interaction with others through non verbal communications.

(x). Chin Annie M.H.(2007) conducted a study to assess Clinical Effects of Reminiscence Therapy in Older Adults: A Meta-Analysis of Controlled Trials. This paper aimed to examine the clinical effects of reminiscence therapy on the life satisfaction, happiness, depression and self-esteem of older adults aged 50 or above.Potential studies were mainly identified through the keywords: "reminiscence", "life review", "reminiscing" and "milestoning" from 12 electronic databases; and by manual search from the references and bibliographies of related papers and 14 journals. In addition, 11 mental health, ageing and geriatrics related websites were visited to capture additional studies. All pre-post testdesign controlled trials before 2001 comparing the life satisfaction, happiness, depression and self-esteem of older adults receiving reminiscence therapy and no treatment were included. The kind of intervention should be aligned with that defined by Haight & Burnside (1993). Data regarding study identification, study design, characteristics of subjects, and intervention and outcomes were extracted independently by two extractors, who were also responsible for quality assessment of the studies. For each outcome, the pooled standardized mean difference (SMD) in post-test between the two comparison groups was calculated. Sensitivity analysis was done to assess the robustness of the overall effects with and without including studies with non- normally distributed data. File-drawer method was used to detect possible publication bias.A total of 15 studies were included for analysis.

Reminiscence therapy showed significant beneficial effects on happiness (pooled SMD = 1.09; 95% CI, 0.26 to 1.92) and depression (pooled SMD = −0.90; 95% CI, −1.49 to −0.32).It was concluded that owing to the problems of the limited number of included studies, the small sample size of the trials, the possible play of publication bias, language bias and Hawthorne effect, no convincing conclusion regarding the effects of reminiscence therapy can be drawn.

(xi.) Pameetha .K (2000), conducted a study to assess the role of reminiscence therapy in health and anxiety. This experimental study investigated the patients who had been identified as demonstrating health concerns. 40 patients were randomly allocated to experimental and control group. Anxiety was assessed before and after reminiscence therapy. Patients in the reminiscence therapy group showed reduced level of anxiety at post test even when they also had identifiable physical problem. These results are consistent with the ideas that reminiscence therapy can be an effective and accessible method.

(xii) .Rabbi Bernard Cohen (2000), conducted an experimental study in Canada, to assess the effectiveness of reminiscence therapy on psychosocial distress in lung transplant patients and their families. 36 lung transplant clients and their support people were examined for psychosocial distress, coping style and orientation to independent learning before and after self help book in a programme to alleviate distress and encourage adaptive coping. Subjects rated the books as highly acceptable and none complained as increased distress. Results revealed as the changes in coping strategies.

III.Studies Related to effectiveness of reminiscence therapy on psychological well being

(xiii). An experimental study was conducted in Taiwan to find out effect of reminiscence therapy on psychological well-being, depression, and loneliness among the institutionalized aged. The samples consisting elderly of 65 years and above who were assigned randomly to two groups 45 in the experimental group and 47 in the comparison group. Data was collected using Centre of Epidemiological

Studies Depression Scale (CES-D), Symptom Checklist –90-R (SCL-90-R), Revised University of California Los Angeles Loneliness scale (RULS – V3) and Mini Mental Status Examination (MMSE). T-test, Munn Whitney U – test and Generalized Estimating Equation was used in the analysis of data. After the intervention of Reminiscence therapy the average depression score of group decreased from 19.11 point in pre test to 16.18 and 15.49 after 3 months of intervention and follow up respectively, logical well being score fell from 27.09 points to 24.13 and 23.91 after 3 months of intervention and follow up. The average score of loneliness decreased from 42.24 points to 34.82 and 35 respectively. The results showed reminiscence therapy had decreased depressive symptoms, improved psychological wellbeing and alleviated feelings of loneliness

(xiv).A quasi experimental study was conducted on the effectiveness of reminiscence group therapy on self esteem, depression, loneliness and life satisfaction of the people who are living alone in Taiwan. The study included 12 elders living alone in experimental group who in 10 RGT sessions. Whereas the control group included 14 elderly people engaged in regular group activities for ten weeks. The effectiveness of RGT was evaluated by using non parametric tests Results indicated that group reminiscence therapy significantly improved self-esteem, although effects on depression and life satisfaction were not significant. Reminiscence groups enhanced elder's social interaction with one another in nursing home settings and become support groups for participants.

(xv).Ernst Bohlmeijer, Marte Roemer Pim et al (2006) conducted a meta analytic study to evaluate the effects of reminiscence on psychological well-being in older adults. This study presented the results of a meta-analysis to assess the effectiveness of reminiscence on psychological well-being across different target groups and treatment modalities. Fifteen controlled outcome studies were included. An overall effect size of 0.54 was found, indicating a moderate influence of reminiscence on life-satisfaction and emotional well-being in older adults. Life-review was found to have significantly greater effect on psychological well-being than simple reminiscence. In addition, reminiscence had significantly greater effect on community-dwelling adults than adults living in nursing homes or residential care. Other characteristics of participants or interventions were not found to moderate effects. It is concluded that reminiscence in general, but especially life review, are potentially effective methods for the enhancement of psychological well-being in older adults. However, a replication of effectiveness studies of the well-defined protocols is now warranted.

(xvi).**Gerben J. Westerhof, Ernst Bohlmeijeret al (2010)conducted a study** This article explores recent progress in theory, research and practical applications of reminiscence. It first describes the evidence for reminiscence as a naturally occurring process, and discusses the different functions of reminiscence and their relationships with mental health and lifespan processes. Three basic types of reminiscence that relate to mental health are specified: conversations about autobiographical memories and the use of personal recollections to teach and inform others have social functions; positive functions for the self include the integration of memories into identity, recollections of past problem-solving behaviours, and the use of memories to prepare for one's own death; negative functions for the self are the use of past memories to reduce boredom, to revive bitterness, or to maintain intimacy with deceased persons. It is proposed that in interventions the three types are addressed differently: simple reminiscence

	stimulates social reminiscence and bonding and promotes positive feelings; life review uses the positive functions to enhance personal wellbeing; and life-review therapy seeks to reduce the negative uses and thereby alleviate symptoms of mental illness. Studies of the effectiveness of interventions have provided some evidence that interventions are effective in relation to their goals. The review closes with recommended directions for future reminiscence research. (xvii).**Wang J.J and Cheng S.F.(2003).** conducted a longitudinal quasi experimental study to examine the effects of reminiscence therapy on four mental health indicators, including depressive symptoms, mood status, self esteem and self health perception. 94 subjects completed the study with 48 in control group and 46 in the experimental groups. The study concluded that in the experimental group, a statistically significant difference (p=0.0410) was found between the pre-post tests on the dependent variable depressive symptom. (xviii) **Fallot. (2003).** conducted an experimental intervention study on the use of reminiscence as a therapeutic tool. 36 women of various ages participated in two one hour therapy sessions. The two sessions consisted of a reminiscence session and a non reminiscence session. These were counter balanced so that one –half received the non reminiscence first. Self ratings of mood were made before and after each session. Results demonstrated increase positive mood following the reminiscence sessions. **MATERIALS AND METHODS**

8.1 **RESEARCH APPROACH :-** Evaluative approach

RESEARCH DESIGN :- Quasi experimental research design

Group	Pre Test	Treatment	Post Test
Experimental Group	O_1	X	O_2
Control Group	O1		O2

O_1 :- Pre test (Level of Psychological well being)

X :- Reminiscence therapy

O_2 :- Post test (Level of psychological well being)

VARIABLES

8.2
- **INDEPENDENT VARIABLE :-** Reminiscence therapy
- **DEPENDENT VARIABLE :-** Level of psychological well being among senior citizens

8.3 **.SETTING OF THE STUDY**

The study will be conducted in a selected old age home at Meerut.

8.4 **SAMPLE :-** Senior citizens

8.5 **SAMPLPING TECHNIQUE :-** The sampling technique adopted for this study is purposive sampling

SAMPLING SIZE:-The proposed sample for this study is 60 old age clients both male and female.

8.6 30 in experimental group, 30 in control group.

CRITERIA FOR SAMPLESELECTION

- **INCLUSION CRITERIA**

8.7
1. Male and female senior citizens of 60 and above 60 yrs of age
2 .Senior citizens who can speak and understand Hindi / English.
3. Elderly persons willing to participate in the study
4.Senior citizens not currently receiving any other psychological treatment for improving psychological well being.

- **EXCLUSION CRITERIA**

1.Senior citizens who are terminally ill.
2.Senior citizens who refuse to give consent.
3. Senior citizens with sensory deficits like impaired vision, speech problem, hearing problems cognitive impairments like memory and severely .

TOOLS FOR DATA COLLECTION

8.8 Tools contain Part I and II

Part I comprises the demographic questionnaire which will be used to assess the demographic variables like age, sex, marital status, education, religion, domicile, period of stay and reasons for joining.

Part II consists of a Ryff scale of psychological well being to assess the level of psychological well being among senior citizens.

DATA COLLECTION PROCEDURE

8.9 The researcher will administer the demographic questionnaire and standardized Ryffscale of psychological well being to assess the pre test psychological well being scores of the Senior citizens. The senior citizens will be selected and the reminiscence therapy will be given for 2 weeks. Following this therapy by using the Ryff scale of psychological well being , the post test score will be assessed and the scoring will be noted.

METHOD OF DATA ANALYSIS

Appropriate statistical methods will be used. The plan of data analysis as follows

1. Pretest and post-test scores of the client out comes will be analyzed by descriptive inferential statistics by mean, median, standard deviation and range.
2. The effectiveness of reminiscence therapy will be analyzed by using 't' test

8.9 3. Association of pretest scores with selected demographic variable will be analyzed by chi- square.

Time and duration of study

The proposed study duration is 30 days.

DOES THE STUDY REQUIRE ANY INTERVENTION OR INVESTIGATIONS TO BE CONDUCTEDON PATIENTS OR OTHER HUMANS OR ANIMALS?

8.10 Yes , The study involves administration of remninscence therapy on sample.

HAS THE ETHICAL CLEARENCE BEEN OBTAINED YOUR INSTITUTION ?

Yes informed consent will be obtained from the institution authorities and subjects. Privacy confidentiality and anonymity will be guarded. Scientific objectivity of the study will be maintained with honesty and impartiality.

8.11
- **COST INVOLVED IN :-** Rs. 10,000 (approx)
- **WHO WILL BEAR THE COSTS OF THE REQUIREMENTS ?:-**SELF

8.12

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PERFORMA FOR PROJECT COMPLETION REPORT

To,
Head of Department
Name of department: **Mental Health Nursing**
Name of College: **PannaDhaiMaaSubharti Nursing College**

Date: 10.11.2020

Findings of the project: (Max -100 words):

The Mean of the pre-test and post-test score of control group was 92.15 and 94.35 respectively and the Standard deviation of the pre-test and post-test score was 14.44 and 14.38 respectively. The difference of mean post-test level was 161.05 in experimental group and 94.35 was in control group and the Standard deviation was 36.11 in experimental group and 14.38 in control group. The mean difference was 66.7. The calculated Unpaired "t" test score was 8.1788 for df 38 at 0.05 level of significance which was higher than the table value. So, the Reminiscence therapy on senior citizens was an effective method to increase level of psychological well-being. Hence the research hypothesis H_2 was accepted at 0.05 level of significance. The study concluded that Reminiscence Therapy was effective on senior citizens to increase their level of psychological well-being.

External Support: Enticeway Tradelink Pvt. Ltd.

Name of PI: Ex.Capt.Dr.GeetaParwanda

Name of the Department: Community Health Nursing

Name of College: PannaDhaiMaaSubharti Nursing College

Title of the Project: **A study to evaluate the Effectiveness of Reminiscence Therapy in terms of psychological well-being among senior citizens at residents of selected community at Meerut**

Signature of the P.I.

Duration of the Project: 53 weeks

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING
SWAMI VIVEKANAND SUBHARTI UNIVERSITY

Data Scrapping for E-Content Generation

REPORT

under
Resource Mobilization for Research

Avantika

(Co- Investigator)

Er. Shweta Garg

(Principal Investigator)

Assistant Professor,
Department of CSE,
SITE, SVSU

2019-20

Summary Sheet

1. **Name of the Principal Investigator:**Er. Shweta Garg
   PhoneNo:9997665066**Email: shweta19garg@gmail.com**
2. **Institution :**Subharti Institute of Technology & Engineering
3. **Project Title:**Data Scrapping for E-Content generation
4. **Date of Sanction :**04/10/2019
5. **Abstract :**

The scraping is defined as "extracting useful information from HTML pages by parsing the webpages using specially coded programs for manipulation; it is also called data extraction".Scraping is also known by other synonyms like downloading, harvesting, retrieval etc. All these three elements (web, data and scraping) form the core of the "digital economy" and the base element of the information society which we are witnessing right now.

Popular uses of data scraping include:

- Research for web content/business intelligence
- Pricing for travel booker sites/price comparison sites
- Finding sales leads/conducting market research by crawling public data sources (e.g. Yell and Twitter)
- Sending product data from an e-commerce site to another online vendor (e.g. Google Shopping)

Web Data Scrapingcan be done in two ways

1. Advanced Searching Techniques on Searching Engines
2. Customizing our own Search Engine

6. Major Work Done

• Present the methods of web data scraping, so that it can be implemented in E-Content generation.

• Find and present a universal method for evaluation of the performance of one scaping tool or for comparing the performance of one scaping tools to another.

7. Methodology :

Web data Scraping involves:

i) Determine the structure of the website to be scraped and build a sitemap

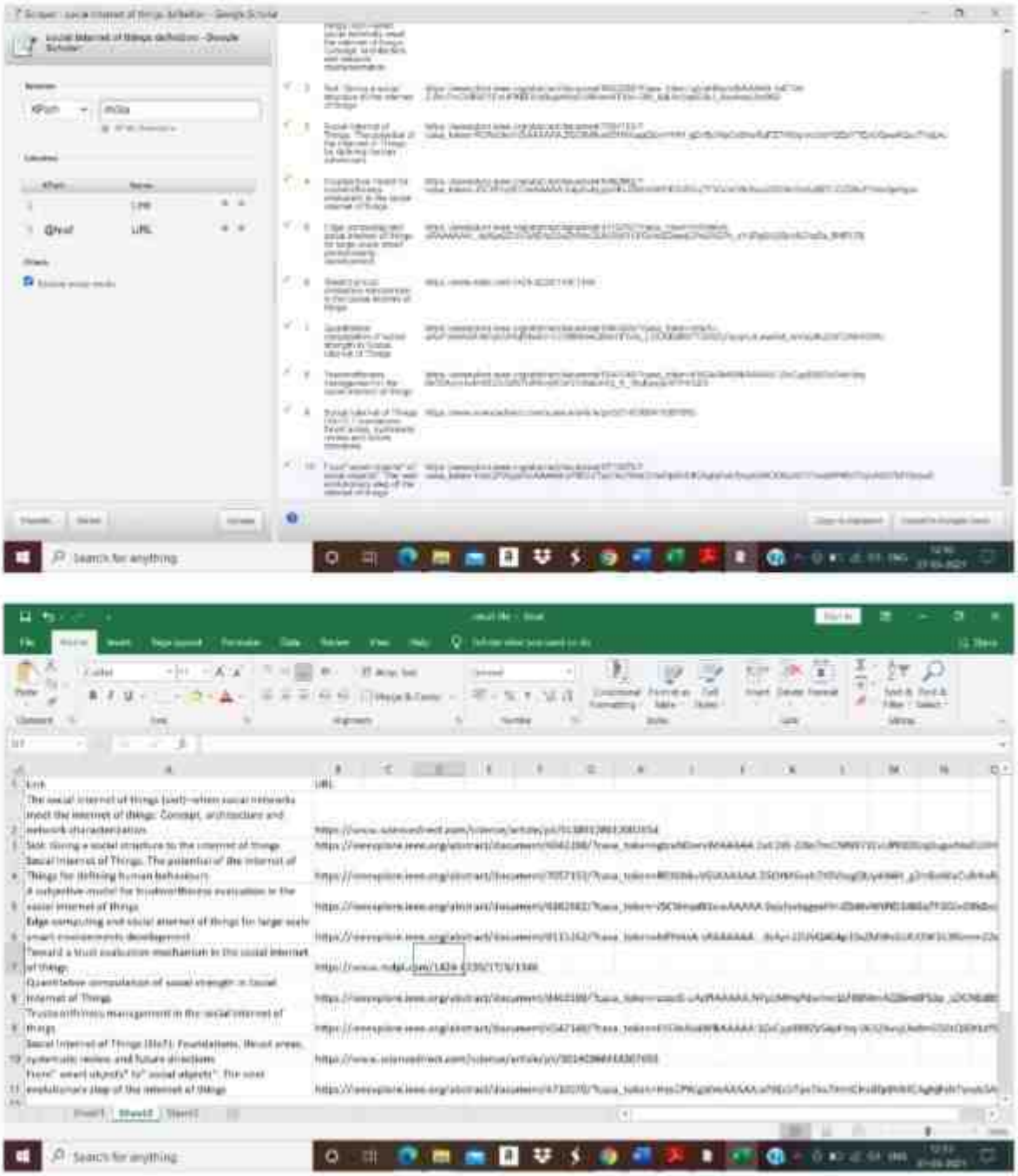
ii) Store the findings in a local database, saved as a CSV (Comma-Separated Values) file.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	web_scraper_start_url	category	category_href		subcategory	subcategory_title	price	description						
2	http://webscraper.io/Phones		http://webscrap	Touch		http://we	Nokia X	$109.99	Android, ultra dualboot					
3	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	Dell XPS 13	$1281.99	13.3" Touch, Core i5-4210U, 8GB, 128GB SSD, Windows 8.1					
4	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	IdeaTab S5000	$172.99	Silver, 7" IPS, Quad-Core 1.2GHz, 16GB, 3G, Android 4.2					
5	http://webscraper.io/Phones		http://webscrap	Touch		http://we	iphone	$699.99	Silver					
6	http://webscraper.io/Phones		http://webscrap	Touch		http://we	iphone	$699.99	Black					
7	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	IdeaTab A3500	$99.99	Black, 7" IPS, Quad-Core 1.2GHz, 8GB, Android 4.2					
8	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Apple iPad Air	$604.99	Wi-Fi, 64GB, Silver					
9	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	IdeaTab A8-50	$121.99	Blue, 8" IPS, Quad-Core 1.2GHz, 16GB, Android 4.2					
10	http://webscraper.io/Phones		http://webscrap	Touch		http://we	iphone	$681.99	White					
11	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Galaxy Note	$489.99	12.2", 32GB, WiFi, Android 4.4, White					
12	http://webscraper.io/Phones		http://webscrap	Touch		http://we	Sony Xperia	$118.99	IP5, waterproof					
13	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Acer Iconia	$96.99	7" screen, Android, 16GB					
14	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Asus MeMO Pad	$102.99	7" screen, Android, 8GB					
15	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Galaxy Note 10.1	$587.99	10.1", 32GB, Black					
16	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Galaxy Tab 4	$215.99	LTE (SM-T235), Quad-Core 1.2GHz, 8GB, Black					
17	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Lenovo IdeaTab	$89.99	7" screen, Android					
18	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Galaxy Note	$299.99	10.1", 3G, Android 4.0, Garnet Red					
19	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	iPad Mini Retina	$537.99	Wi-Fi + Cellular, 32GB, Silver					
20	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	Aspire E1-572G	$581.99	15.6", Core i5-4200U, 8GB, 1TB, Radeon R7 M265, Windows 8.1					
21	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	ThinkPad Yoga	$1033.99	12.5" Touch, Core i5-4210U, 4GB, 500GB + 16GB SSD Cache,					
22	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	ThinkPad X240	$1111.99	12.5", Core i5-4300U, 8GB, 240GB SSD, Win7 Pro 64bit					
23	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	Pinbook	$739.99	14", Core i5 1.6GHz, 4GB, 500GB, Win7 Pro 64bit					
24	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	Aspire E1-510	$386.99	15.6", Pentium N3530 2.16GHz, 4GB, 500GB, Linux					
25	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Galaxy Tab 3	$197.99	7", 8GB, Wi-Fi, Android 4.2, Yellow					
26	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	ThinkPad Yoga	$1224.99	12.5" Touch, Core i5-4200U, 8GB, 500GB + 16GB SSD Cache, Windows					
27	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Amazon Kindle	$163.99	6" screen, wifi					
28	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	Pavilion	$699.99	15.6", Core i5-4200U, 8GB, 750GB, Windows 8.1					
29	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	Inspiron 15	$785.99	Moon Silver, 15.6", Core i7-4510U, 8GB, 1TB, Radeon HD R7 M265 2GB,					
30	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	HP 350 G1	$571.99	15.6", Core i5-4200U, 4GB, 750GB, Radeon HD8670M 2GB, Windows					
31	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	ThinkPad T540p	$1178.99	15.6", Core i5-4200M, 4GB, 500GB, Win7 Pro 64bit					
32	http://webscraper.io/Phones		http://webscrap	Touch		http://we	Samsung Galaxy	$93.99	5 mpx, Android 5.0					
33	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Media Pad HO1 10	$230.99	White, 10.1" IPS, 1.6GHz, 2GB, 16GB, Android 4.2					
34	http://webscraper.io/Phones		http://webscrap	Touch		http://we	Nokia 123	$24.99	7 day battery					
35	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	Xperia E1 D2005	$99.99	Black, 7", 1.6GHz Dual-Core, 8GB, Android 4.4					
36	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	HP 250 G3	$520.99	15.6", Core i5-4210U, 4GB, 500GB, Windows 8.1					
37	http://webscraper.io/Computers		http://webscrap	Laptops		http://we	ThinkPad X230	$1346.99	12.5", Core i5 2.6GHz, 8GB, 180GB SSD, Win7 Pro 64bit					
38	http://webscraper.io/Computers		http://webscrap	Tablets		http://we	MeMo Pad HD 7	$161.99	IPS, Dual-Core 1.2GHz, 8GB, Android 4.3					

8. Majoroutcomes

Internet being the graveyard of big data is poses huge challenges before the students and the researchers owing to the presence of huge data which is non contextual, non-relational and unstructured spread over a vast network of servers. Scraping holds the key to this voluminous information by applying filters and setting rules for the incoming information.

Screenshots of sample Input Data



Screenshots of sample Output Data

Signature of Principal **Counter signature by Head of Institution**

Investigator withdate

PERFORMA FOR PROJECT COMPLETION REPORT

To,
Head of Department
Name of Department: COMPUTER SCIENCE & ENGINEERING
Name of College: S.I.T.E

Date: 19/12/2020

Findings of the project: (Max-100 words):

1. Present the method of web data scraping for generation of E- content.
2. Compared the performance of scraping tools.
3. Use Universal method for evaluation of performance of scraping tools
4. Segregate the web data which is non contextual, unstructured & nonrelational in nature over web for E-content.

External Support:

Adobe books

Name of PI: ER. SHWETA GARG
Name of the Department: CSE
Name of College: SITE
Title of the Project: Data Scrapping for E- Content Generation
Duration of the Project: 1 year

Shweta
Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

Preparation and Characterization of Curcumin based Nanoemulgel Formulation

Name of the investigator

Mr. Kunal Arora, Mukesh Kumar

In collaboration with

Agarwal Pharmacy, Khera, Ghaziabad Pin code-245304

Commencement of the work: 10-09-2019

Completion of the work: 09-09-2020

Key objectives

1. Designing of curcumin nanoemulgel formulation of different concentration.
2. To perform microbiological studies of curcumin Nanoemulgel.
3. To enhance absorption of nanoemulgel by using suitable carrier incorporating in the formulation.
4. To characterized the prepared curcumin nanoemulgel formulation.

Plan of work

1. Literature review related on curcumin, nanogel formulation.
2. Selection of drug and excipient for the preparation of nanoemulgel formulation.
3. Preformulation studies.
4. Selection of formulation.
5. Characterization of nanoemulgel formulation.

Material and Method

Materials: Curcumin API, tween 80, eudragit S-100, glycerol, carbopol-940,

Preparation of Nanogel - Accurate weighed quantity of Drug, Eudragit S – 100 and Tween - 80 as stabilize are as dissolved in glycerol, although stirring. Prepare aqueous phase contain Carbopol - 940 dissolve in water with endless stirring and heat. These drugs contain phase is sonicated in Ultra sonic bath sonicator. This drug phase is added drop by drop into the aqueous phase during homogenization to form emulsion. The emulsion converted into nanodroplets by homogenizer which formed o/w emulsion. Homogenization was continued for one hour. Triethanolamine is adding to form the gel with continuous stirring to nanogel. Batch A, B, C was prepared at highest rpm 5000 with alteration in composition.

Results

UV spectroscopy-

Sr. No.	Concentration (µg/ml)	Wavelength
1	1	0.122
2	2	0.268
3	3	0.332
4	4	0.434
5	5	0.756

High Performance Liquid Chromatography (HPLC)

Annexure 1 (Test solution 1% rep.1 and rep.2)

(Test solution 2% rep. 1 and rep.2)

(Test solution 3% rep. 1 and rep. 2)

Sr. No.	Name of test sample		Asymmetry
1	T1% rep.1	Curcumin	1.15
		Desmethoxycurcumin	1.14
		Bis-dethoxycurcumin	1.12
	T1% rep.2	Curcumin	1.12
		Desmethoxycurcumin	1.13
		Bis-dethoxycurcumin	1.19
2	T1% rep.1	Curcumin	1.10
		Desmethoxycurcumin	1.12
		Bis-dethoxycurcumin	1.09
	T1% rep.2	Curcumin	1.09
		Desmethoxycurcumin	1.11
		Bis-dethoxycurcumin	1.01
3	T1% rep.1	Curcumin	1.07
		Desmethoxycurcumin	1.08
		Bis-dethoxycurcumin	1.14
	T1% rep.2	Curcumin	1.15
		Desmethoxycurcumin	1.13
		Bis-dethoxycurcumin	1.15

Zeta potential–

Sr. No.	Name of sample	Zeta potential
1	T1%	-13.5
2	T2%	-14.2
3	T3%	-11.4

Spreadability

Spreadability (S) = M x L / T

Where, M = Weight tied to upper slide

L = Length of glass slides

T = Time taken to cover distance by upper slide.

Sr. No.	Formulation	Spreadability (g.cm/s)
1	T1%	20.01
2	T2%	18.44
3	T3%	10.09

Percentage of drug entrapment

Sr. No.	Formulations	(%) of Drug Entrapment
1	T1%	99.12
2	T2%	98.34
3	T3%	98.64

Viscosity

Sr. No.	Formulations	Eta	Tau
1	T1%	122.782	221.007
2	T2%	97.418	174.025
3	T3%	96.425	177.566

Stability studies

Sr. No.	Time duration	Formulations	Color & pH
1	15 Days	T1%	No change
2	1 Month	T2%	No change
3	3 Months	T3%	No change

90

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department **Date: 18.02.2021**

Name of Department: Pharmaceutics

Name of College: Kharvel Subharti College of Pharmacy, SVSU, Meerut

Findings of the project: (Max-100 words):

The re-formation study was performed and formulation was evaluated. The study shows λ max at 418nm that the Nanoemulgel of curcumin was successfully performed. Further, formulation of curcumin in 1% 2% and 3% was carried out and stable. It was further subjected to U.V. analysis. Finally, all data are collected in a Preformulation and prepare the formulation. FTIR data was also analyzed which gave a clearly idea/ which indicated a successful formulation. These spectra are confirmed that there are no changes in a functional group. In the formulation % of drug release are as to showing the entrapment of drug. Formulations are stabilized for 3 months. These result of indicates that they are stable for a physically and chemically.

External Support: Supported by Agarwal Pharmacy

Name of PI: Mr. Kunal Arora

Signature of PI:

Name of the Department: Pharmaceutics

Employee Code of PI:

Name of College: Kharvel Subharti College of Pharmacy, SVSU, Meerut

Title of the Project: Preparation and Characterization of Curcumin based Nanoemulgel Formulation

Duration of the Project: 1 Year

Registrar
Swami Vivekanand
Subharti University
MEERUT

PROSPECTIVE RANDOMIZED COMPARATIVE STUDY OF EFFICACY OF INTRALESIONAL TRIAMCINOLONE ACETONIDE WITH PLATELET RICH PLASMA VERSUS INTRALESIONAL TRIAMCINOLONE ACETONIDE ALONE IN ALOPECIA AREATA ALONG WITH DERMOSCOPIC ASSESMENT.

Research Proposal Submitted

By

Dr. Arvind Krishna and Dr. Parul Singh

Department Of Dermatology, Venereology And Leprosy

Subharti Medical College & Hospital

INTRODUCTION

Alopecia areata (AA) is an autoimmune disease characterized by round or oval patches of non-scarring hair loss. It can affect any hair bearing area of the body but most commonly the scalp[1].

About 1.7% of the population experiences an episode of alopecia areata (AA) during their life time. The prevalence of alopecia areata (AA) in the general population is 0.2% with no sex predilection[2] . It mostly affects children and young adults although any age group may be affected.

Current treatment modalities available are corticosteroids (topical, intralesional, oral), tacrolimus, minoxidil, contact immunotherapies like squaric acid dibutyl ester, diphencyprone, and photo(chemo)therapy using UVA and psoralen[3] .

Of the various modalities, intralesional corticosteroid is being most widely accepted and used with a level of evidence A.

Platelet-rich plasma (PRP) has emerged as a new treatment modality in dermatology, and preliminary evidence has suggested that it might have a beneficial role in hair growth.potentiality to promote hair growth in areas containing hair follicles is known since 1900[4]. Considering the early clinical evidence and basic science that supports the application of PRP in hair restoration surgery, it is reasonable to evaluate PRP for treatment of alopecia areata. However there is no good trial evidence of any treatment which provides long term benefit to the patients with alopecia areata (AA).

In the last few years dermoscopy has been increasingly used in the evaluation of patients with hair loss and this technique is a very important tool as it improves diagnostic

accuracy of hair and scalp disorders.[5] It is a noninvasive diagnostic tool which works on the principle of illumination of a lesion with different light sources and its study with a high magnification lens that may or may not be connected to a camera or a computer[6]. It can be used to diagnose the type of alopecia and assess hair regrowth.

Hence the present study aims at comparing the relative efficacy of intralesional triamcinolone acetonide with PRP in alopecia areata as compared to intralesional triamcinolone acetonidemonotherapy along with their dermoscopicassesment.

AIMS & OBJECTIVES

1. To study the epidemiology and clinical features of Alopecia Areata
2. To compare efficacy of PRP with intralesional triamcinolone acetonide over intralesional triamcinolone acetonide alone in cases of AlopeciaAreata.
3. Dermoscopy in alopecia areata as a tool for diagnosis, prognosis and response to therapy.

MATERIALS & METHODS

STUDY DESIGN

A prospective randomized study will be conducted on 50 clinically diagnosed patients of alopecia areata attending the out-patient department of Dermatology, Venereology and Leprosy of ChhatrapatiShivajiSubharti Hospital, Meerut within 2 years of approval by the university. Ethical committee clearance will be obtained.

SELECTION CRITERIA

INCLUSION CRITERIA

1. Newly diagnosed untreated cases of localized scalp alopecia areata

   (<=5 patches and <25% scalp involvement) of both sexes, age >15years

2. Patients consenting for required treatment

EXCLUSION CRITERIA

1. Diagnosed cases already on treatment (in the last 3 months)

2. Alopecia with more than 5 patches and >25% scalp involvement

3. Alopecia areata involving areas other than the scalp

4. Patient with history of bleeding disorders/anticoagulant therapy

5. Patients with active infection at the local site

6. Patients with keloidal tendency

METHODS

After the purpose and the contents of the study have been fully explained, written informed consent will be obtained from all patients fulfilling the inclusion criteria.

HISTORY

A detailed history will be taken with reference to the onset, duration, and progression of the lesion, no. of patches, stability, age of onset, associated symtoms, history of similar lesions in the past, family, and any other relevant skin or systemic disease, history of recent stressful event.

EXAMINATION

Dermatological examination of the lesions will be carried out with respect to morphology, distribution, and nail involvement.

All patients will be informed regarding the nature of disease, course, prognosis, and the probable adverse effects of the treatment modalities.

INVESTIGATIONS

CBC, thyroid profile, coagulation profile, scalp biopsy (if required)

After randomization, fifty cases of alopecia areata will be recruited into 2 groups of 25 patients each. Two different regimes will be used for each group:

Regime I

Intralesional Steroid (Inj. Triamcinolone acetonide10 mg/ml)

Intralesional injection of 0.1ml/cm^2 administered along with PRP at an interval of 3 weeks.

Regime II

Intralesional Steroid (Inj. Triamcinolone acetonide 10 mg/ml)

Intralesional injection of 0.1ml/cm^2 administered at an interval of 3 weeks.

FOLLOW-UP

Each patient will be followed up at monthly intervals of 3 weeks, 6 weeks, and 9 weeks for treatment and 24 weeks for a follow-up . The end point of the study will be 3 months or complete resolution.

Response to treatment will be evaluated subjectively and objectively. Photographs will be taken before the procedure and then periodically every month.

Subjective evaluation will be performed by examination of the patch for any hair growth.Grading will be carried out based on subjective assessment as follows:

- Grade I : slight improvement, barely noticeable (up to 25%)
- Grade II : moderate improvement, noticeable (25-50%)
- Grade III: obvious improvement (51-75%)
- Grade IV: marked improvement (>75%)

Objective evaluation will be carried out based on SALT scoring(Severity of Alopecia Tool Score)

SALT scoring – This calculation is based on a scoring system. The scalp is divided into the following 4 areas:

1 Vertex: 40% (0.4) of scalp surface area.

2 Right profile of scalp: 18% (0.18) of scalp surface area.

3 Left profile of scalp: 18% (0.18) of scalp surface area.

4 Posterior aspect of scalp: 24% (0.24) of scalp surface area.

Percentage of hair loss in any of these areas is the percentage hair loss multiplied by percent surface area of the scalp in that area.

SALT score is the sum of percentage of hair loss in all the above-mentioned areas.

The results will be analyzed and tabulated.

DERMATOSCOPIC ASSESSMENT

Dermoscopic analysis of AA would be carried out in all the patients. In all patients, the clinical diagnosis was made by standard clinical observation,trichograms would be carried out in the involved areas, and past family history.

PERFORMA FOR PROJECT COMPLETION REPORT - 233

To,

Date: 11/11/2021

Head of Department

Name of Department: Dermatology Venereology and Leprosy

Name of College: Subharti Medical College

Findings of the project: (Max-100 words):

PRP has emerged as a NAV Treatment Modality and Shown effective Results with any Remarkable adverse effects in the t/t of alopecia Areata

External Support: Himalayan Bauddh Darshan Shodh Sansthan

Name of PI: Dr ~~Chanti Khanduja~~ Parul Singh

Name of the Department: Dermatology Venereology and Leprosy

Name of College: Subharti Medical College

Title of the Project: Evaluation of Efficacy of Intralesional Triamcinolone Acetonide with platelet rich Plasma in Alopecia Areata along with Dermoscopic Assessment

Duration of the Project: 2017-2020

Employee Code

Signature of P.I.

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING
SWAMI VIVEKANAND SUBHARTI UNIVERSITY

IMPROVEMENT OF THE MECHANICAL PROPERTIES OF RAIL THERMIT WELDS BY HEAT TREATMENT

REPORT

Under
Resource Mobilization for Research

Er. Guru Sewak Kesharwani

(Principal Investigator)

Assistant Professor,
Department of ME,
SITE, SVSU

2019-20

Summary Sheet

1. **Name of the Principal Investigator:** Er. Guru Sewak Kesharwani
   Phone No: 9027358394 **Email: guruk0042@gmail.com**
2. **Institution :** Subharti Institute of Technology & Engineering
3. **Project Title :** Improvement of the Mechanical properties of rail thermit welds by heat treatment
4. **Date of Sanction :** 24/11/2020
5. **Abstract :**

Thermite welding is the most common method of rail track joining along with the Flash butt welding. It is used throughout the world to join lengths of rails into Continuous Welded Rail (CWR) instead of bolted joints. The bolted joints give a noisy and uncomfortable ride experience, so CWR is more common nowadays. Now we can see tens of kilometers of continuous rail tracks welded by Alunino-thermic Welding (ATW). There are other methods of welding rails also, like Flash Butt Welding however the thermite process has the advantages of relative simplicity, portability and low cost.

With the advent of high speed rails and increased load demands, many researchers have focused on improving the mechanical properties of thermite welds and extending the service life. The thermite welds often fails under fatigue due to its unrefined, cast iron like microstructure. In the present work, heat treatment methods are implemented so that the microstructure of weld is refined and the mechanical properties are improved, consequently increasing the service life. We sought to improve the mechanical properties of the rail thermite welds so that better service life is achieved.

In our work, 60 kg section of IRS-T-19-1994 rail track will be joined using the thermite weld technique. In total, eight test welds are created. Then four of the weld will be subjected to normalizing. The welds are then cut to prepare test samples. These weld samples will be then subjected to various mechanical tests like

Tensile test, Brinell Hardness test and Bending test. Then results of these tests will be compared.

Since thermite welds are essentially steel castings, it is expected that the mechanical properties of the welds can be significantly improved by heating the weld into the austenite range. From the work of other researchers too, it is known that samples of aluminothermic welds can be heat-treated under controlled conditions for producing weld metal with improved mechanical properties and required hardness by utilizing well-known metallurgical principles.

6. Major Work Done

In standard Rail Thermite welding, the procedure includes following steps:-

i) Joint preparation

The two rail ends being welded are cut square and carefully aligned and fixed with a gap of about 25 mm between them. This gap is given for contraction allowance. The track faces are cleaned by kerosene using wire brush.

ii) Mould mounting

A prefabricated rail section shaped sand mould is then placed around the gap. The mould should be centrally symmetrical to the two tracks. Any gaps sealed luting sand. A slag collector is attached to the mould to collect overflowing slag and molten metal.

iii) Preheating of mould

The mould is preheated using a welding torch. Preheating is done to dry the mould thoroughly and to bring the parts to be welded at desired temperature 900oC.

iv) Crucible charging

Crucible is basically a container in which the exothermic reaction takes place. Then a crucible is placed on the top of the mould. Then thermite mixture is charged into the crucible. The thermite mixture is a combination of **finely powdered aluminum** and **iron (III) oxide** (also called ferric oxide) in a mass ratio of 3:5 respectively. The mixture is poured into a crucible that is placed over the mould.

v) Igniting of Thermite mixture

A sparkler is ignited and put into the crucible which starts the reaction. The maximum temperature can reach up to 3500oC. This is enough to make the charge melt.

vi) Pouring

The tapping pin at the bottom of crucible is removed and the molten steel pours into the mould into the gap to form the weld. The slag which is mostly aluminum oxide requires about 25 seconds after completing the reaction to separate from the molten steel and float to the upper part of the crucible. It prevents the molten metal for atmospheric contamination.

vii) Opening of mould

After about 15 minutes the crucible is removed and the mould is opened.

viii) Finishing of weld

As the weld cools down to normal temperature in about an hour, a weld is grinded and finished in required shape using a profile grinder.

7. Methodology:

SAMPLE PREPARATION

Since we have to conduct heat treatment in a furnace, we had to cut the rail track weld into specimen. The cutting was done using Power Saw. The samples were prepared according to the AWS (American Welding Society) Standard.

Fig 11: Specimen cutting

Each specimen was having a length of **36 inches**. In total, eight specimen were prepared. Four for non heat treated welds and other four for heat treated welds.

Fig 12: Final specimens

HEAT TREATMENT OF TEST SAMPLES

A Therese Sealed Quenched Furnace (SQF) was used to perform normalizing on the rail weld samples. It was a gas fired furnace having maximum temperature range of 1150°C. The hydraulic operated furnace doors were opened. The four weld samples were put into the furnace at once using the cold chain drive. The temperature was set to **825°C** and when the furnace temperature reached the desired temperature, it was maintained at the same temperature for 50 minutes. The auto oil quenching operation of the furnace was turned off. After **50 minutes**, furnace doors were opened and the specimens were brought out. The specimens were allowed to **air cooled** till the temperature reached the room temperature.

Fig 1: Sealed Quench furnace (SQF)

Fig 1.2: Specimen coming out of SQF

8. Major outcomes

This study gives a clear implication that conducting Normalizing on Thermite weld considerably improves the tensile strength, ductility, load bearing capacity and deflection bearing ability of the weld.

The effects of heat treatment on various properties are mentioned below:-

- Ultimate tensile strength of the weld specimen increased by 10.83%
- Yield strength of the weld increased by 3.44%
- Ductility of the weld (percentage elongation) is increased by 26.37%
- Maximum bending load is increased by 3.46%
- Bending deflection is increased by 14.68%

- BHN in the weldment is decreased by 16.57%
- BHN in the HAZ is decreased by 13.64%

Thus we can surely conclude that the heat treatment had a considerably improves the Ultimate tensile strength, ductility and bending deflection. Heat treatment also reduces the hardness of the weld which decreases the brittleness of the weld region. All these improvements can be of great advantage for our railway and metro tracks that bear large loads and fatigue. This can improve the quality and serviceability of Thermite welds. Hence we believe this is a way foreword to improve our rail tracks and reduce risk of failure.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 01/01/2021

Head of Department

Name of Department: Mechanical Engineering

Name of College: S. I. T. E.

Findings of the project: (Max-100 words):

→ Ultimate tensile strength is increased by 10.83%.
→ Yield strength of the weld is increased by 9.44%.
→ Ductility of the welded is increased by 26.37%.
→ Maximum bending load is increased by 8.46%.
→ Bending deflation is increased by 44.82%.

External Support:

Nil Books

Name of PI: Er. Gaurav Sewak Kesarwani

Name of the Department: ME

Name of College: S.I.T.E.

Title of the Project: "Improvement of the Mechanical Properties of Rail Thermit welds by Heat Treatment"

Duration of the Project: 1 year

Signature of the PI:

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING
SWAMI VIVEKANAND SUBHARTI UNIVERSITY

An Experimental Analysis on Al 6063 Metal Based on Friction Stir Welding at Different Geometry and Enhance Reliability

REPORT

under
Resource Mobilization for Research

Er. Krishna Kumar Sharma

(Principal Investigator)

Assistant Professor,
Department of ME,
SITE, SVSU

2019-20

Summary Sheet

1. **Name of the Principal Investigator:** Er. Krishna Kumar Sharma

   Phone No: 7905121871 **Email:** kkkesaath@yahoo.co.in

2. **Institution :** Subharti Institute of Technology & Engineering

3. **Project Title :** An experimental analysis on Al 6063 metal based on friction stir welding at different geometry and enhance reliability

4. **Date of Sanction :** 20/10/2020

5. **Abstract :**

Design of Equipment, tensile properties attained with different process parameter, defects morphologies, hardness, mechanical and designed microstructure properties are discussed. Non consuming rotating welding tools, generated heat , plastic deformation, process parameter, percentage elongation, effect on tensile strength at 1400rpm and 22 mm/rev.

FSW, conventional welding process, a potential to revolutionize the aerospace, automobile, ships and marine, electrical and construction industry as versatile commercial application dramatic production cost reduction.

6. **Major Work Done**

The different mechanical properties are to be found for functional requirement of FSW processes.

- Hardness
- Yield Strength
- Elongation
- Fracture Toughness
- Fatigue Crack Growth Rate

7. **Methodology :**

There are three major steps in friction stir welding as,

Plunging – Plunging is operation of localized indulging into the work piece and making a hole in work piece. it is done in two stages as a hole is pierced in the work

at required position by tool pin, the pierced hole in work piece is shape of pin of tool.

Bonding – The tool pin stir edges of work piece and plasticize material and these discharge plasticized metal back to mix together in the groove and make a bonding on solidification of the materials. This process is known as bonding.

Drawing out – The tool pin is inserted into work piece is drawn out leaving a hole of pin size. The pin hole is the drawback of friction stir welding.

8. Major outcomes

FSW has achieved worldwide accomplishment and progress has established itself as a viable joining option for automotive industries, aerospace industries, ships and marine industries, space technology. However more research required in future to analyses and optimize process and applications. Tool Design another very important input which reduces cost and tool wear rates. Tool geometry and process parameters would provide desired weld quality. Proper mechanical selection for tool is very important aspect. Although ability of FSW to weld light weld, high strength,

dissimilar material, from high melting temperature to low melting temperature (plasticizing)of material has its own benefits success rate of practice FSW.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 12/03/2021

Head of Department

Name of Department: Mechanical Engineering

Name of College: S.I.T.E Meerut

Findings of the project: (Max-100 words):

FSW has achieved worldwide accomplishment and progress has established itself as a viable joining option for automotive industries, aerospace, ship and marine industries, space technology. However research required in future to analysis and optimize process and applications. Tool geometry and process parameter would provide desired weld quality.

External Support: Support financially by DHS fondation.

Name of PI: Er. Krishna Kr. Sharma

Name of the Department: ME

Name of College: S.I.T.E.

Title of the Project: An Experimental Analysis on AZ 6063 Metal based on friction stir welding at Different Geometry and Tolerance Reliability

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

Summary Sheet

1. **Name of the Principal Investigator:**Er. Dharmendra Kushwaha
   PhoneNo:8726471558 **Email: dharmendracc0016@gmail.com**
2. **Institution :**Subharti Institute of Technology & Engineering
3. **Project Title:** Study of strength characteristics of Geo-Polymer Concrete by using Rice husk Ash, Steel fiber and Quarry Dust

Introduction

If we want to construct any structure, concrete is the main material. The main element to produce concrete is Portland cement. The production of cement increases the production of pollution because of the emission of CO2 during its production. Globally 5% of total carbon dioxide emission is generated by cement industry. Geopolymer concrete, an unindustrialized material in India, is going to be a revolution not only in the research field but also in the construction industry. Geopolymers, an unique class of inorganic polymers are new promising binders and are manufactured by the activation of a solid state alumino-silicate with a highly alkaline activating solution using thermal drive. In the recent past, Geopolymer binders have been found to be the best alternate to cement binders due to its environmental pleasantness. Geo-polymer cement was developed in the year of 1984 to 2008. Geo polymer is an alumino silicate material which binds the materials together. Geo-polymer technology is to reduce the use of Portland cement in cement concrete.

The role of Ordinary Portland cement in geo polymer concrete is replaced by rice husk ash which also possesses pozzolanic properties same as of Ordinary Portland cement and rich with silicate.

Material used

Quarry Dust

The quarry dust is used as a fine aggregate to produce geo-polymer concrete and it was taken from local quarries.

Coarse aggregate

Coarse aggregates of sizes 12mm and 20mm having following properties taken from a local supplier are used in the present study.

Rice husk ash

Rice husk ash having high percentage of silica, fine silica will provide a very compact concrete. Combustion of rice husk provides rice husk ash. This rice husk ash contains nearly 85-90 % silica. The rice husk ash also is a very good thermal insulation material.

Steel Fiber

Steel Fiber are distributed throughout a given cross section area. Steel fiber improves resistance to impact or progressive loading, and to resist material fragmentation. Steel Fibers are added to concrete in low volume dosages up to 1%, and have been shown to be useful in shortening plastic shrinkage cracking.

Procedure to cast geopolymer concrete

a) To cast geo-polymer concrete convention method to cast normal concrete is utilized.

b) The mixing is done about 6-8 minutes for proper bonding of all the materials.

c) The sizes of the cubes used are of size150mmX150mmX150mm.

d) Sample name designated as SP1-SP3 as per the different molarity.

e) For geo-polymer concrete water curing is not favourable. So for curing purpose geo-polymer concrete cubes directly placed in sun light.

f) After that compressive strength testing will be conducted on different cubes.

Experimental study

In this research work only compressive strength of geo-polymer concrete were analyzed and compared it with conventional concrete. The compressive strength of different geo-polymer concrete cubes is as follow:

Sample Designation	**Compressive strength in N/mm2 of specimen**		
CC	16.6	24.6	28.5
SP-1	15.6	21.5	27
SP-2	19.5	25.4	28.4
SP-3	21.4	26.2	29.5

Major outcomes

Based on the experimental work reported in this study, the following conclusions are drawn.

1. Greater concentration of sodium hydroxide solution results in higher compressive strength of rice husk ash & quarry dust based geo-polymer concrete.

2. The mix SP-3 gives higher compressive strength, as it has high molarity of sodium hydroxide.

3. We observe that the compressive strength is increased with the increase in the molarity of the sodium hydroxide.

4. Geo-polymer concrete shall also be used in the field of construction works.

5. The geo-polymer concrete shall be effectively used for the beam column junction of the reinforced concrete structure.

6. Due to utilization of steel fiber compressive strength also increased.

7. Using steel fiber in the geo-polymer concrete it is found that it can reduced the sudden cracking.

8. Due to steel fiber is geo polymer concrete, concrete is tougher and more resistant.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Date: 25/11/2020

Name of Department: Civil Engg.

Name of College: SITE

Findings of the project: (Max-100 words): 1. The strength of geopolymer concrete is more compare to conventional concrete in compression, tension and flexure strength.
2. The rate of gain of strength is increases with increasing temperature but it is differ for different curing method, but membrane curing method give better results as compared to oven, steam and accelerated curing.
3. The rate of gain of strength is high in between 60°C to 90°C. The rate of gain of strength is slower up to the 60°C and at 120°C the rate of gain of strength is high for 6 hours of curing duration.

External Support:

Adeeba books

Name of PI: Dharmendra Kushwaha

Name of the Department: Civil Engg.

Signature of the P.I.

Name of College: SITE

Employee Code of PI:

Title of the Project: Study of Strength characteristics of Geo-Polymer Concrete by using Rice husk ash, Steel fiber and Quarry dust

Duration of the Project:

Registrar
Swami Vivekanand
Subharti University
MEERUT

ACCEPTABILITY, SAFETY & EFFICACY OF LEVONORGESTREL INTRAUTERINE SYSTEM (LNGIUS) IN CONTRACEPTION

Research Proposal Submitted

By

Dr. SHASHI PRATEEK

Department of Obstetrics &Gynaecology

INTRODUCTION

The current population of India is 1.3 billion as of 2017, based on the latest United Nations estimates[1]. India population is equivalent to 17.86% of the total world population. India ranks number 2 in the list of countries (and dependencies) by population.The population density in India is 452 per Km^2.The total land area is 2,972,892 Km^2.32.8 % of the population is urban (439,801,466 people in 2017)

The median age in India is 27 years[2].India is projected to be the world's most populous country by 2022[3].It is expected to become the first political entity in history to be home to more than 1.5 billion people by 2030, and its population is set to reach 1.7 billion by 2050[4][5].India adds up to 1,000,000 people to its population every 20 days[6][7][8][9][10]

There are various types of contraceptive methods available in today's world. The common ones are hormonal methods like OCPs, minipills, progesterone only pills, etc. Then there are barrier methods like male & female condoms, etc. We also have injectables like DMPA injection. Then we have emergency contraceptive methods. We also have Intra uterine devices; copper containing and hormonal like LNG IUS. There are permanent methods also like vasectomy &tubectomy.

In 1952, India became the first country in the world to initiate a family planning program[11].The LNG IUS was first approved for medical use in 1990 in Finland and in the United States in 2000[12].It is on the World Health Organization's List of Essential Medicines, the most effective and safe medicines needed in a health system[13].More than 120 countries have approved the device and it is used by more than 10 million women[12][14].

India adopted LNG IUS as contraception in the year 2015.LNG IUS is a T-shaped device with body containing Levonorgestrel (a potent progestin of 19-nortestosterone) 52mg; with a release rate of 20 mcg/24 hours. It lasts for atleast 5 and upto 7 years[15][16].

AIMS & OBJECTIVES

To study the acceptability, efficacy and safety of LNG IUS as a contraceptive method.

MATERIAL AND METHOD

- This is a prospective study which will be conducted in the department of Obstetrics & Gynaecology, Subharti Medical College, Meerut; over a period of two years from 1st September 2017 to 31st August 2019.
- All women along with their relatives coming to department of Obstetrics & gynaecology and willing to know about contraceptive methods for spacing or limiting family size will be offered counselling for contraception. Counselling will be done by cafeteria approach and GATHER method.
- Any woman who will opt for some specific method or brought by her relatives will be again counselled about various available contraceptives. Subjects opting for LNG-IUS as contraceptive method will be enrolled in present study after evaluating them for inclusion & exclusion criteria.
- A didactic approach will be adopted and the women and her family members will be allowed to ask questions and discuss their concerns.
- Patient will be followed for 1 month, 3 month and 6 month interval.

Inclusion criteria:

All women of reproductive age group opting for LNG IUS as contraceptive method.

Exclusion criteria:

	WHO MEC Category
• Pregnancy	4

- Postpartum 48 hours to <4 weeks 3
- Unexplained vaginal bleeding 4
- HIV infection 3
- Cervical cancer 4
- Current breast cancer 4
- Liver tumour 3
- Acute venous thrombosis 3
- Current PID 4
- Sepsis 4

The LNG-IUS will be inserted into the uterine cavity according to the insertion instructions given in annexure 4.

I am conducting this study to see the acceptability, compliance, safety and efficacy of the LNG IUS in the general population in terms of user satisfaction and other benefits, given its high cost, which forbids people opting for it.

Statistical Analysis:

All data will be tabulated as Mean ± S.D. Non parametric tests will be applied for nominal & ordinal data and parametric tests will be applied for interval type of data. A value of $p<0.05$ will be considered as significant, $p<0.01$ as highly significant & $p<0.001$ as very highly significant.

ANNEXURE II

PATIENT INFORMATION SHEET

1. Prospective longitudinal study to find out the safety, efficacy and acceptability of LNG IUS as contraception.
2. Duration of participation for each subject will be 6 months, where in 3 visits are required at 1, 3, and 6 months of insertion.
3. After LNG IUS insertion, she will be advised the follow up schedule, precautions plus few side effects that can occur with LNG IUS.
4. All information regarding the patient will be kept confidential.
5. You can refuse to be a part of this study at any point of time.
6. For any queries / problems contact: Dr. Prateek Gupta on 9896366748.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 11/11/21

Head of Department Dr. Mamta Tyagi

Name of Department: Department of Obstetrics & gynaecology

Name of College: Subharti Medical college

Findings of the project: (Max-100 words):

LNG - IUS is a safe, effective & acceptable form of contraception and not only helps in contraception, but also has many non-contraceptive benefits and is has minimum side effects related to postpartum phase & Breast feeding women

External Support: Himalayan Bauddh Darshan Shodh Sansthan

Name of PI: Dr. Shashi Prateek

Name of the Department: Department of Obstetrics & gynaecology

Name of College: Subharti Medical College

Title of the Project: Acceptability, Safety & efficacy of Levonorgestrel Intrauterine system (LNG-IUS) as Contraception.

Duration of the Project: 2years

Employee Code

Signature of P.I.

Registrar
Swami Vivekanand
Subharti University
MEERUT

Research Proposal

1. Title of the Project :**Phytonematode diversity from Mango Orchard, Chutmalpur, Saharanpur**

2. Name, Designation and Addresses of Principal and Lead Investigators : Dr. Razia Sultana
Assistant Professor,
Department of Zoology
SVSU, Meerot-250005

3. Institution where the project will be implemented Department of Zoology
SVSU, Meerot-250005

(a) Specification of research question(s)

- To undertake survey for collection of soil samples from different mango orchard in Chutmalpur, Saharanpur district of UP.
- To identify and characterise the species associated with different crops based on morphological and/or molecular tools.
- To enrich the collection of National Nematode Collection of India, document the nematode fauna in the form of a monograph

(b) Review of literature

Phytonematodes belong to four major groups viz., Tylenchids, Aphelenchids, Dorylaimids and Triplonchids. Among the reported nematodes from Assam and adjoing areas, tylenchids (includes aphelenchid) constitutes 54%, dorylaimids, 37% and mononchids 9% (Rahman, 2002). Earliest record of plant parasitic nematodes from NE region was known from tea in Assam; infestation of *M. hapla*, *M. incognita*, *Pratylenchus* spp. on tea seedlings was recorded (Das, 1958). Several phytonematode genera were recorded from the rhizosphere of tea (Basu, 1967; Banerjee, 1967, Toklai Exp Sta, 1968). Among the phytoparasitice nematodes, *Hirschmanniella oryzae* in rice (Mathur and Prasad, 1972), *M. incognita* in vegetables (Roy, 1972), *M. graminicola* (Roy, 1973), *Ditylenchus angustus* in rice (Roy, 1977), *Paratylenchus pseuduncinatus* from tea, *P. neolepidus* from pomegranate and *Gracilacus raskii* from bamboo (Phukan and Sanyal, 1979), *Hemicriconemoides cocophilus* and *H. magniferae* from trees, *Macroposthonia onostris* from brinjal, *M. medani* and *Helicotylenchus magnicephalus* from citrus (Phukan and Sanyal, 1980); *H. dihystera* and

Tylenchulus semipenetrans from citrus (Phukan and Sarmah, 1983) have been reported from Assam. Several nemtode speceis viz., *Tylenchus citri* around the root of rose in arunachal Pradesh, *Basiria graminiphila* from pear, *Scutellonema orientalis* from pine, *Criconemella onoensis* from Kadam in Jorhat, Assam have been identified (Rahman, 1983). A cyst nematode speceis, *Brevicephalodera bamboosi* from bamboo root was report reported from Assam (Swarup, 1988). *Discocriconemella oryzae* in the roots of paddy in Meghalaya, and *M. incognita* and *M. javanica* in vegetables and papaya from Arunachal Pradesh were also reported (Das, 2001).

Among dorylaimid phytoparasites, *Xiphinema labiata* in fern from Meghalaya (Khan, 1982), Longidorus nirulai from Meghalaya (Rahman, 1983) *Paralongidorus sali, X. orthotenum, X. mammilocaudatum* from Assam, *P. spiralis; X. brevicolle* (Rahman, 1983) from Arunachal Pradesh, *Trichodorus borai* in the roots of bamboo from Assam and *T. complexus* in cane from Arunachal Pradesh (Rahman, 1985). Later Singh (1989) confirmed the occurrence of *X. mammilocaudatum* in tea and *T. borai* from tea and coffee from Assam. *Longidorus cocavus* in the roots of plum, *L. lobus* in pineapple (Singh and Khan, 1997) , *X. filicaudatum* around banana roots occurs in Arunachal Pradesh (Singh and Khan, 1998).
Recently, eight known species and a new species, *Aphelenchoides aerialis* have been identified from Manipur (Bina *et al*., 2013).

(c) Gaps in knowledge

- No systematic studies of orchard nematodes have been carried out and the nematode information from the above-mentioned is meager.
- Economically important nematodes like white tip nematode in rice, flowers, orchids etc. and root knot nematodes in various crops (agri-horticultural crops) has not been investigated
- In NNCI, nematode fauna from Saharanpur is not far less than what should be expected as on today

(d) Outline of research methodology

Major Work plan

- Collection of samples from different orchard of the mentioned area.
- Extraction, preservation and maintenance of nematode species/genera for identification and morphological/molecular characterisation of species.

- Cataloguing nematode species from orchard for National Nematode Collection of India
- Preparation of GIS based distribution map, reports, and research manuscripts/monographs.

i. ***Collection of samples*:** Soil along with roots, plant parts (foliage, bud, grains etc.), decaying barks and wood of diseased plants, etc. will be collected from different habitats will be used for preparation of GIS based map of phytoparasitic nematodes.

ii. ***Nematode extraction*:** Nematode specimens from soil and root samples will be extracted following Cobb's decanting and sieving (Cobb, 1918) followed by modified Baermann's technique while from plant parts and others, modified Baermann's technique will be suitably adapted.

iii. ***Fixation and Preservation of Nematodes*:** Nematodes will be fixed in Triethanol Amine Formalin (TAF) or FA fixatives for morphological study and wet preservation. Specimens will be processed for SEM studies and species characterisation.

iv. ***Processing of Nematodes*:** Nematode specimens will be processed by Glycerol–ethanol method (Sienhorst, 1959).

v. ***Mounting of specimens*:** Mounting will be done on anhydrous glycerol on glass slide and sealing will be done by wax-ring /nail polish.

vi. ***Morphology and morphometrics***: Nematodes will be studied under Trinocular Compound Microscope/SEM and all measurements will be taken using an ocular micrometer or Image Analysing Software. Illustrations or photomicrography will be done with the help of drawing tube (OLYMPUS COMPOUND MICROCOPE-BX-51) or and further processing through image analysing software. De Man's ratio will be determined along with others for identification and species description.

vii. ***Molecular diagnosis of nematode species:*** Effort will be made to discriminate species based molecular method and the standard protocol for DNA isolation (Floyd *et al.*, 2002), PCR-RFLP of r-DNA of ITS regions and nucleotide sequencing will be followed.

viii. ***Identification*:** Identification of nematode genus and species will be done following standard method and in consultation with published literatures.

(e) Modalities for dissemination of Research Outputs:

- Information generated on diversity of phytonematodes from orchard will unearth the potential biodiversity of the region. The identified nematode specimens will enrich National Nematode Collection of India (NNCI).
- Scope of molecular diagnostic method in the study will help to identify cryptic species and to resolve confusion in differentiating morphologically similar species and that will add to our current knowledge on morphospecies.
- Documentation on phytonematodes from the area of study will open up the scope of further exploration of species diversity in economically important phytonematodes.
- Some phytonematode species are potential pathogens of forest crops (pines), orchid (*Cattleya* sp./*Phalaenopsis* sp.), flower (chrysanthemum/tuberose/salvia/gladioli) and field crops (rice/onion/oat). The nematode information generated through this investigation will be useful to address the biosecurity issues on threatening nematode species in India particularly in Indo-Myanmar and Indo-Bangladesh borders.

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PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 12-03-2021

Head of Department

Name of Department: Zoology

Name of College: Kesar Verma Subharti College of Science

Findings of the project: (Max-100 words):

Samples were collected from three different mango orchard of Chutmalpur, Saharanpur. Samples were processed to extract nematodes. Nematodes were observed under microscope. Most of the nematodes not identified till the time belong to orders Tylenchida & Rhabditida of phylum Nematoda.

External Supervisor: Jyoti Ranj Sarkar

Name of PI: Dr. Razia Sultana

Name of the Department: Zoology,

Signature of the P.I.

Name of College: KVSCOS

Employee Code of PI:

Title of the Project: Phytonematode diversity from mango orchard, Chutmalpur, Saharanpur

Duration of the Project:

Registrar
Swami Vivekanand
Subharti University
MEERUT

HISTROCHEMICAL OBSERVATIONS ON MID GUT WHEN TREATED WITH MELAMINE : Periplaneta *americana*.

PROJECT

Swami Vivekanand Subharti University, Meerut
Keral Verma School of Science
Department of Zoology

Prof. (Dr.) Vinay Panwar
(Principal scientist)

Swami Vivekanand SUBHARTI UNIVERSITY

Where education is a passion....

HISTROCHEMICAL OBSERVATIONS ON MID GUT WHEN TREATED WITH MELAMINE: Periplaneta *americana*.

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Introduction

Carcinogens, are chemicals that causes cancer. Cancer is an abnormal growth condition in an organism that manifests itself in at least three ways. The rate of cell growth in cancerous tissues differ from the rate in normal tissues. Cancerous cells spread to other tissues they know no bounds. O.D. Tygai, Yadav (1975).

The term chemical carcinogensis is generally defined to indicate the induction or enhancement of neoplasia by chemicals. It although in the strict etymologic sense, this term means the induction of carcinomas, it is widely used to indicate tumorigeiesis. In other words, in includes not only epithelial malignancies carcinomas but also mesenchymal malignant tumors (sarcomas) and benign tumors. (The extension to benign tumor is justified because no carcinogen that produces only benign tumors has been discovered)

It is generally agreed (e.g. (WHO 1969) that the response of an organism to a carcinogen may be in one or more of these forms).

1. An increase in the frequency of one or several types of tumors that also occur in the controls.
2. The development of tumors not seen in the controls.
3. The occurrence of tumors earlier than in the controls.
4. An increase in the number of tumors in individual animals compared tosd the controls

Tumors are of result of abnormal cell proliferation. Therefore the study of tissues growth normal and abnormal constitute the central problem of tumor research which thus become essentially a biological problem. When approached from this broader point of view an analysis of timorous growth should include representatives from all groups of living organisms. It has been recognized that the study to plant tumors yields significant results. Within the animal kingdom comparative pathology has concerned itself largely with neoplasm in various groups of vertebrates while invertebrate have been all but neglected. As a matter of fact, until fairly invertebrate

tissues were often considered in capable of developing timorous growth (Berta Scharrer and Margaret Lochhead 1950).

Another types of research in carcinogensis is aimed at improving existing methods and devising new methods for prompt and reliable identification of carcinogen chemicals. This problem stems mainly from the fact that cancer only occur in response to a chemical long after its first entry into a organism often the chemical in no longer detectable in the body by the time the tumor develop (Frank C LU (1996))

The study of tumors in insects is still at an elementary stage. The primary barrier to study is the great difficulty of evaluating the status of growths of swelling in insects, any irritation result in an accumulation of blood cells around the affected region and blood cells may quite normally take on strange shapes and invade healthy tissues of all types. The number of hemocytes in the blood may also very from time to time as sessile cells are mobilized into the blood stream so that the sudden appearance of cells in any region, despite an apparent scarcity in the hemolymph does not necessarily indicate any multiplication of cells.

Melanotic tumors in insects have been known for a long time. In Drocsophila, these tumors have been considered in relation to the problem of cancer, which, in turn has some connection with somatic variation of genetic origin. Whether that relations exists generally is doubtful. But cases are known in which neoplastic invasion in Dorsophila is linked to production of melalnotic masses (C laudo Barigozz Melanatic Tumors in Drosophia - 1958)

Scharrer and Lochhead (1950) list the records of the scontaneous tumors which have been found in other insects, but the only one in which any histological details is known occurs in a lepidoipteran larva Pygrora d The tumor affect the male only, but the female carnes the gene for the abnormal growth The tumor are either free floating or attached to the gut tissues gaglia or muscles. In some tumors there are giant cells and multipolar division occurs, the center of the tumors consists of necrotic cells.

Recent studies have shown that Drosophia develops malignant intermediate and benign neoplasm which are caused by singed gene mutations. Such mutation on different chromosomes, can easily be isolated at various stages of developmental amd are therefore most useful in developmental studies. Lethal mutants with specific development effect are of great value for the understanding of the function and time

of action of gene s as they are tissues and stage-specific and regulate particular developmental processes Neoplastic transformation in Drosopohila is a development problem and the mutants causing it are essentially developmental mutants.

Lethal neoplastic growth in Drosophila results not only from genetic changes but also from epigenetic aberrations, such as take place during continuous in vivo cultures of imaginal disks. Gateff (1971, 1978) Gateff, Akai and Schneiderman (1974) or after prolonged culture of cells in vitro.

The present investigations were undertaken to study whether the established carcinogens dinitrophenol cause tumor in Periplaneta americana and to study whether the tumors formed if any of melanotic or mitotic origin.

The present study would throw light on the cellular defence mechanism and tumors in insect with special referenced to the chemical carcinogens.

Carcinogens, are chemicals that causes cancer. Cancer is an abnormal growth condition in an organism that manifests itself in at least three ways. The rate of cell growth in cancerous tissues differ from the rate in normal tissues. Cancerous cells spread to other tissues they know no bounds. O.D. Tygai, Yadav (1975).

The term chemical carcinogensis is generally defined to indicate the induction or enhancement of neoplasia by chemicals. It although in the strict etymologic sense, this term means the induction of carcinomas, it is widely used to indicate tumorigeiesis. In other words, in includes not only epithelial malignancies carcinomas but also mesenchymal malignant tumors (sarcomas) and benign tumors. (The extension to benign tumor is justified because no carcinogen that produces only benign tumors has been discovered)

Tumors are of result of abnormal cell proliferation. Therefore the study of tissues growth normal and abnormal constitute the central problem of tumor research which thus become essentially a biological problem. When approached from this broader point of view an analysis of timorous growth should include representatives from all groups of living organisms. It has been recognized that the study to plant tumors yields significant results. Within the animal kingdom comparative pathology has concerned itself largely with neoplasm in various groups of vertebrates while invertebrate have been all but neglected. As a matter of fact, until fairly invertebrate tissues were often considered in capable of developing timorous growth (Berta Scharrer and Margaret Lochhead 1950).

MATERIAL & METHODS

Collection and Rearing of Insects

The insect selected for the present study is Periplanata americana (Linn) (Female adult)) Orthoptera: Dictyoepra.

Periplaneta americana, were collected from hotel, garbage and dark wet places and reared in insect eages in the laboratory and fed regularly with balanced diet and water.

Chemicals Used and the Method of Treatment

The chemicals used for the present investigation are **Crude Protein**

Method of Treatment

The concentrations were determined according to the highest of mortality with a high dose and doses below it, till safe concentration was reached served as experimental concentration.

Crude Protein was given in food LC_{100}, LC_{50} and LC_0 (experimental concentration) values were calculated by the method of Finny (1971). LC_{100} 0.5% LC_{50} 0.25% and LC_0 0.07% for **Crude Protein** were calculated was used as experimental concentration for **Crude Protein**. These doses were calculated at 96 hours duration. The experimental concentration was used throughout the experiment.

The adult insects which were treated with **Crude Protein** were vivisected after 5,10,15, 20, days of the treatment.

The experimental insects were divided into three groups 10 pair of insects (Female adult) were used in the experiment. the experiment were carried out in the following combinations:

1. The group of insects which were neither treated with drug nor their solvent comprised the normal group.
2. The group of insects which were treated with same volume of solvent acetone comprised the central group.
3. The group of insects which were treated with the drugs comprised the experimental group.

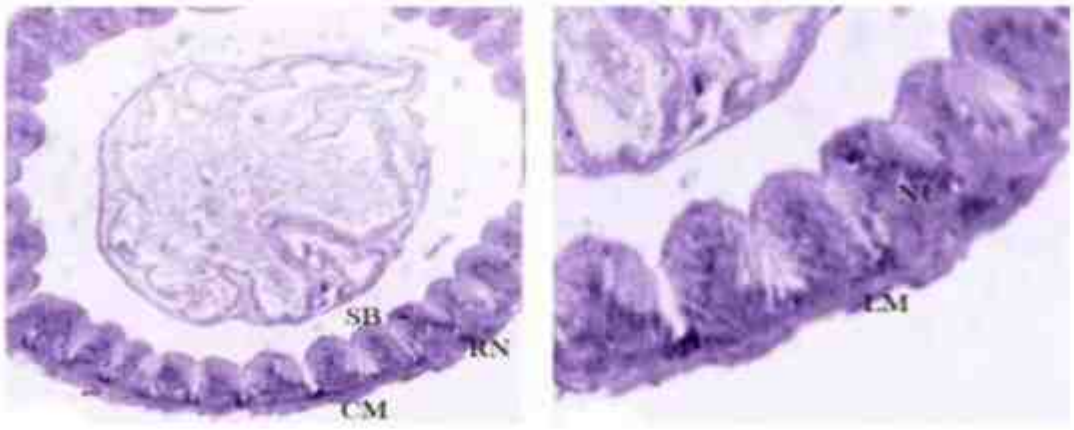
HISTOCHEMICAL TECHNIQUES:-

1. **For protein-** For the detection of protein mercuric bromophenol blue staining technique from Pearse (1960) will be applied.
2. **Periodic Acid Schiffs reaction** – (PAS) method of Mc Manus and Cason (1950) from Davenport (1966) will be applied for the detection of Carbohydrates.
3. **For lipid detection-** Sudan Black "B" method will be applied.
4. **For Enzyme detection-** For the detection of enzyme alkaline Phosphatase technique from Pearse (1960) will be applied.

Kjeldahl method:

Kjeldahl method, a universally used quantitative method for assessing protein content in food.The addition of 1 g of melamine to 1 L of milk falsely increases the protein content by 0.4%. When melamine is dissolved at the room temperature, 3.1 g of melamine can be dissolved in water without forming precipitate, and protein content will falsely increase by 1.2%. This can roughly lead to an overestimation of the protein content in liquid milk by 30%. In case of milk powder, the amount of melamine added can be greater because of its greater solubility at higher temperature

when adding warm water.



1a 1b

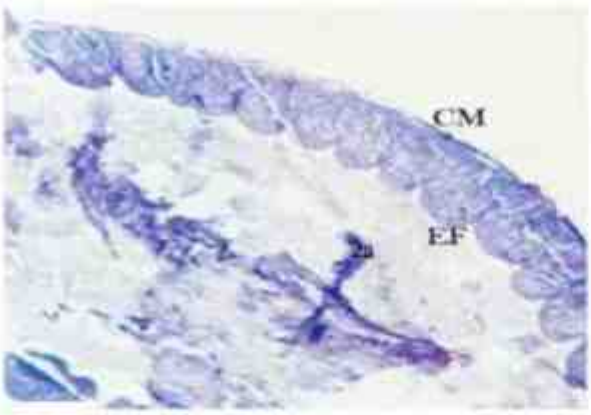
Fig. 1a : Section mid gut tissue of normal adult P. americana showing, protein positive well developed circular as well as longitudinal muscles, epithelial cells , striated border (X 100) Mercuric bromophenol blue stain.

Fig. 1b : The same showing and enlarged view (X440) Mercuric bromophenol blue stain.

Study of Histochemical observation on gut of adult P.americana

Normal Histochemical observation on mid gut of adult P. americana (F)

1. The tissue is well developed in shape.
2. The columnar cells of epithelium layer are in normal shape and shows protein positive nature.
3. The circular muscles as well as longitudinal muscles are well developed and protein (Fig. 1a and 1b.)
4. Nuclei are also protein positive .
5. The cytoplasm is well developed and less protein positive.



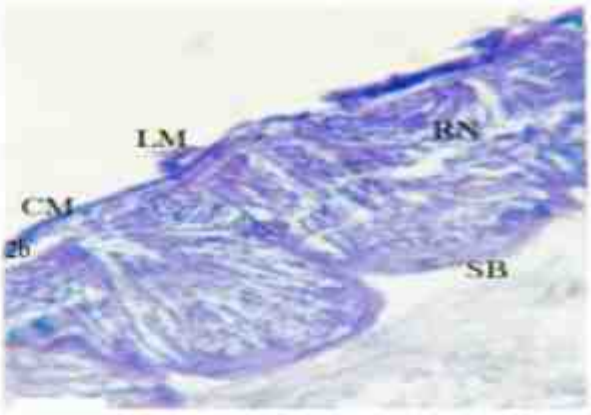
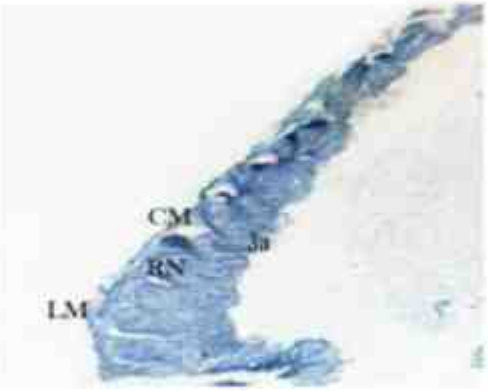
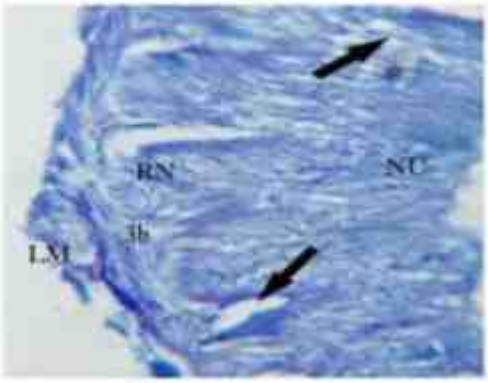


Fig. 2a: Section of the gut of adult P. americana showing, protein positive thick circular and longitudinal muscles and regenerative nidi less protein positive after 5 days treatment with 2,4-DNP (X100) Mercuric bromophenol blue stain.

Fig. 2b : The same showing an enlarged view (X440) Mercuric bromophenol blue stain.



3a



3b

Fig. 3a : Section of the gut tissue of adult P. americana showing, distorted circular and longitudinal muscles which are less protein positive, columnar cells and vacuolated cytoplasm are less protein positive after 10 days treatment with 2-4 DNP (X100) Mercuric bromophenol blue stain.

Fig. 3b: The same showing an enlarged view the enlarged columnar cell (arrow) (X440) Mercuric bromphenol blue stain.

Histochemical observations on mid gut of 2,4-dinitrothenol treated adult Periplaneta americana (F).

5 Day

The gut epithelium is more or less normal in shape. The circular muscles as well as longitudinal muscles are slightly distorted and protein positive (Fig. 2a). Regenerative nidi are normal in shape and are protein positive. The cytoplasm is less protein positive. The columnar cells of epithelium layer are protein positive (Fig. 2b) but the nuclei are less protein positive.

10 Day

Further degeneration of the gut epithelium is evident. The circular muscles as well as longitudinal muscles are distorted and show less protein positive nature. The columnar cells have become big in size and shows less protein nature, vacuolated cytoplasm also show less protein positive nature, Regenerative nidi are found in groups and are also less protein positive. Nuclei and slightly larger in size and show protein negative. The intima also destroyed and shows less protein positive (Fig,. 3a and b)

4a 4b

Fig. 4a : Section of the gut tissue of adult. P. americana showing, enlarged columnar cells and distorted regenerative nidi very weak protein positive in nature, vacuolated cytoplasm is protein negative after 15 days treatment with 2-4 DNP (X100) Mercuric bromophenol blue stain.

Fig. 4b : The same showing an enlarged view of vacuolated cytoplasm of columnar cells which is protein negative (X440) Mercuric bromophenol blue stain.

5a 5b

Fig. 5a : Section of gut tissue of adult P. americana showing, obliterated columnar cells, distorted circular and longitudinal muscles which are very weak protein positive after 20 days treatment with 1-nitroso-2-napthol (X100) Mercuric bromophenol blue stain.

Fig. 5b : The same showing an enlarged view with obliterated additional epithelial layer which is less protein positive (X440) Mercuric bromophenol blue stain.

15 Day

Distortion of the epithelium is further evident. Degenerated circular muscles as well as longitudinal muscles show the protein positive nature, regenerative nidi are also distorted and are protein negative in nature. The columnar cells have lost their architecture and are very weak protein positive in nature. The cytoplasm is severely vacuolized and shows protein negative nature (Fig. 4a and b).

20 Day

The gut epithelium has lost its architkecture. The circular muscles as well as longitudinal muscles are distorted and are very less protein positive. The columnar cells formed additional layer and which are obliterated and degenerative and are very less protein positive. The nuclei of columnar cell are degenerated and if present bigger in size and show very less protein positive nature (Fig. 5a and b).

Discussion

Protein

As regard the effect of 2,4 –DNP, on t he gut the circular as well as the longitudinal muscles were distorted and less positive . The regenerative nidi were found in groups and less positive. The columnar cells had increased in number their nuclei were with diffused and pycnotic chromation material and less protein positive. The striated border was distorted and less protein positive in nature.

The histochemical work on adipose tissue of inscect is very scanty/Barleses (1999) has reported the presence of protein granules in the fat body of normal and treated insect.

Wigglesworth (1942, 49) reported Aedes and drosophila cell, protein granules as protein vacuoles. As regard the adipose tissue of Rhodnius, Wigglesworth (1941) has described that protein was found In a condensed zone around the nucleus with filaments radiating outwards between the fat droplets:

Odhibambo (1947) has not found protein granules in the fat body of the Schistecerca, however, Banerjee (1971) in P. pictus and Bhakthen and Gilbert (1972) in H. ceropia and H. gloveri have not found discard granules of protein in the cytoplasm as well as in the peripheral globules. Aggrawal (1976) reported protein positive substances are observed in cytoplasm and also in peripheral globules.

ACKNOWLEMENT

The author are grateful to Swami Vivekanand Subharti University, Meerut authority for providing laboratory facilities.

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PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 13-11-2021

Head of Department Dr. Vinay Pawar

Name of Department: Zoology

Name of College: KVSCOS

Findings of the project: (Max-100 words):

Effect of Metanil yellow on the gill, the ovary as well as hepatocytes were distorted and less positive. The regenerative cells were found in group and less positive. The columnar cells had increased in number, their nuclei were with dispersed and pyknotic chromatin material and less protein positive.

External Support: Krishna innovation

Name of PI: Prof. (Dr.) Jaivinay Tiwari

Signature of the P.I.

Name of the Department: Zoology

Name of College: KVSCOS

Employee Code of PI:

Title of the Project: Histopathological alterations on the gill, ovary treated with metanil yellow in Puntius sophore

Duration of the Project:

Registrar
Swami Vivekanand
Subharti University
MEERUT

PROJECT PROPOSAL

ON

Isolation of lignocellulolytic fungi from sugarcane pressed mud

SWAMI VIVEKANANDA
SUBHARTI UNIVERSITY

SUWAMI VIVEKANAND SUBHARTI UNIVERSITY, MEERUT

Submitted by:

Principal Investigator

Dr. Permod Kumar
Assistant Professor
Department of Botany,
Keral Verma Subharti College of Science, SVSU, Meerut

DLRC Committee:

1. **Dr. Anju Rani, Incharge**
2. **Dr. Hasrat Ali, Associate Professor (Member)**

1. **TITLE OF RESEARCH PROJECT: "Isolation of lignocellulolytic fungi from sugarcane pressed mud".**

2. **INTRODUCTION:** sugar industry with approximately 400 sugar factories rank as the second major agro-industry in the country. The sugar- cane industry has several co-products of immense potential value. The co products include pressmud (filter cake), molasses and spent wash. Out of which pressmud is produced during clarification of sugarcane juice. About 3.6 - 4% of sugarcane crushed end up as pressmud *i.e.* 36 - 40 kg of pressmud is obtained after 1 ton of cane crushing (Bhosale *et al.*, 2012, Patil *et al.*, 2013).

Pressmud is a soft, spongy, amorphous and dark brown material containing sugar, fiber and coagulated colloids including cane wax, albuminoids, inorganic salts and soil particles. It consists of 80 % water and 0.9 -1.5 % sugar, organic matter, nitrogen, phosphorus, potassium, calcium, sulphur, coagulated colloids and other materials in varying amounts. The advantages of using sugarcane pressmud for soil application is its low cost, slower release of nutrients, presence of trace element, high water holding capacity and mulching properties. It is freshly applied to the soil directly from the factory; it has the tendency to burn the plants as a result of the rapid decomposition of the new sugarcane pressmud which liberates heat and ammonia in high concentrations.

Lignocellulose degradation by these fungi is performed by complex mixtures of cellulases (Dashtban et al.,2009; Weng et al., 2008) and ligninases (Weng et al., 2008; Sanchez, 2009) reflecting the complexity of the materials. Nagendran et al., (2009) cited that, multitude ofenzymatic activities are required for the conversion of lignocellulosic biomass into useful (fermentable) products.

3. **OBJECTIVES** : The proposal will include following objectives:

(i) Isolation the fungi from pressed mud of Mohidinpur and Bulandshahr suger mills.

(ii) Identification of isolated fungi.

(iii) To check the Liginocellulolytic activity of the isolated fungi.

4. REVIEW OF LITERATURE

Microbial biomass is not only used as an indicator of soil quality, it is the main agent that also controls the cycling of important nutrient elements such as C, N, P, S and other nutrients in terrestrial ecosystems.

Soil microorganisms play a vital role in soil environment. They are critical factors that determine soil organic matter decomposition, nutrients cycling, soil degradation and bioremediations of soil pollution (Li *et al.*, 2012). Shifts in the structure and composition of microbial community are strong indicators of soil biological activity, soil quality and crop productivity of terrestrial agro-system (Opala, 2012). Addition of pressmud organic manure under different moisture regimes brought out significant changes in microbial activity in terms of microbial population and dehydrogenase activity over control (Anbarasu *et al.*, 2016).

Amongst the various treatments, application of press mud resulted in the highest microbial C and N, this might be due to the microbial activities long time storage duration (Perucci, 1992) and acted as an energy source for the autochthonous microorganisms of pressmud, which also significantly increased the microbial numbers (fungi, bacteria and actinomycetes) and total C and N contents in the soils (Leita *et al.*, 1999).

5. MATERIALS AND METHODS:

Collection of the soil sample: The material of sugarcane pressed mud was collected from U.P State Suger Corporation Ltd. Suger Mill Mohidinpur, Meerut (U.P) and Wave Industrial Ltd. Suger Mill, Panni Nager, Bulandshahr (U.P.). The soil sample (sugarcane pressed mud) was dried and had done filtrate by the snigger and prepared of collected materials are ready to create the serial dilution.

Preparation of culture media: 200gm of potato tubers are peeled and boiled , extract was collected by filtration, 20gm Dextrose Agar 20 gm were added and make up volume 1000ml by adding distilled water and boil it till completely mixing. The pH was adjusted to 5.6 5ml of the prepared Broth was added to the test tubes than cotton plugs were applied. Autoclaved at 121^{0}C,

15 lbs pressure for 15 minutes than the autoclave was allowed for cooling the broth tubes were removed and stored at 4^0C for future use.

Preparation Serial dilution –5 test tubes with 9 ml distilled water were prepared 10 ml distilled water and add 1g of soil (sugarcane pressed mud) and shake by Vortex shaker. Dilution 10^{-1} to 10^{-3} were prepared by transferring 1 ml soil sample from 1st test tube for repeated upto 10^{-3} dilution and shaked properly and putted to the settle down soil particles for some time and take from each dilution 1 ml sample were transferred to each petriplates (blank).

Isolation of Fungi: 5 test tubes with 9 ml distilled water were prepared 10 ml distilled water and add 1g of soil (sugarcane pressed mud) and shake by Vortex shaker. After that potato dextrose agar media were poured in each dilution and mention of with matker pan and after solidifying potato dextrose agar media in petri plates were incubated at 28^0C temperature for 5 days or 24 to 72 hours.

SAMPLE TESTING: The liginocellulolytic test (carboxy methyl cellulose agar medium) was prepared for sample testing. The Warm media was poured each petri plates of 5ml quantity of solidifying media and added the sample of isolated fungi by inoculating loop in the center. All petri plates were incubated at 28^0C temperature for 5 days.

6. **DURATION OF PROJECT:** 1.5 years (18 months)
7. **RELEVANCE OF THE PROJECT:** The organic waste samples (press mud) were collected from agro-based industries and from the agriculture fields consisted of both biotic and abiotic components with different physio-chemical parameters. Further analysis of the individual activities of each microbial species.
8. **SOURCE OF MONEY:**
   Institutional, SWAMI VIVEKANAND SUBHARTI UNIVERSITY
   Subhartipuram, N.H. 58, Delhi-Haridwar Bypass Road,
   Meerut-250005, Uttar Pradesh, India
9. **SEED MONEY REQUIRED:** Yes

10. References

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Dr. Permod Kumar
Assistant Professor, Department of Botany,
(Principal Investigator)

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Date: 20/01/2021

Name of Department:

Name of College: KVSCOS

Findings of the project: (Max-100 words): Total 15 fungal species are isolate from different location of pressed mud. Finally A. niger and A. flavus Lignocellulolytic activity are more effective as compare to different fungal species and different parameters.

External Support: Support received from North Agency.

Name of PI: Dr. Pramod Kumar

Name of the Department: Botany

Name of College: KVSCOS

Signature of the P.I.

Title of the Project: Isolation of lignocellulolytic fungi from sugarcane pressed mud

Employee Code of PI:

Duration of the Project: 1 years

Registrar
Swami Vivekanand
Subharti University
MEERUT

Cover Page

Project Title

"AFTAB ALAM-LAPLACE TRANSFORM OF SOME MOMENTOUS FUNCTIONS "

SWAMI VIVEKANANDA
SUBHARTI UNIVERSITY

Name	:	Dr. Aftab Alam
Title	:	Associate Professor
Department	:	Mathematics & Statistics
E-mail ID	:	tyagi80aftab@gmail.com
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Phone	:	Home: +91-9897886668,
Faculty	:	KV Subharti College of Science

Project Title

"AFTAB ALAM-LAPLACE TRANSFORM OF SOME MOMENTOUS FUNCTIONS"

Objects:

The project inquires the Aftab Alam-Laplace transform of some momentous functions which can be used for solving various differential and integral equations. Both transform is a powerful mathematical tool for the engineering to solve engineering problem. The purpose of this project is to prove the applicability of obtaining Aftab Alam-Laplace transform of some momentous functions.

INTRODUCTION

Dinesh Verma Transform (DVT) and Laplace Transform approaches play a significant role in solving various problems in science and engineering separately [1], [2], [3] [4], [5], [6], [7].The differential and integral equations are generally solved by adopting Laplace transform method The Dinesh Verma Transform (DVT) and Laplace Transform is applicable in so many fields and effectively solving linear differential equations, Ordinary linear differential equation with constant coefficient and variable coefficient can be easily solved by the Dinesh Verma Transform (DVT) and Laplace transform without finding their general solutions[8], [9] [10], [11], [12], [13]. In this project, we present a new approach called Aftab Alam-transform (AAT) - Laplace transform for obtaining Aftab Alam-transform (AAT) -Laplace transform of some momentous functions.

BASIC DEFINITIONS

The Laplace Transform with parameter p of $u(x)$ is

$$L\{u(x)\} = \int_0^\infty e^{-px}\, u(x)dx$$

$$for\ Parameter\ p > 0$$

The AFTAB ALAM- Transform (AAT) with parameter q of $v(x)$ is

$$D\{v(y)\} = q^5 \int_0^\infty e^{-qy}\, v(y)dy$$

The usual Laplace –AFTAB ALAM- Transform (AAT) is defined as

$$LD\{f(x,y)\} = \bar{f}\,(p,q) = q^5 \int_0^\infty \int_0^\infty f(x,y)R(x,y)\,dxdy$$

Where,

$$R(x,y) = e^{-(px+qy)}$$

METHODOLOGY:

AFTAB ALAM- LAPLACE TRANSFORM OF SOME MOMENTOUS FUNCTIONS:

|A|

$$DL\{sinax\ sinby\} = q^5 \int_0^\infty \{sinax\ sinby\}\, e^{-(px+qy)}\, dxdy$$

$$= \left[q^5 \int_0^\infty e^{-qy}\ sinby\, dy\right]\left[\int_0^\infty e^{-px}\ sinax\, dx\right]$$

$$= q^5 \left[\left\{ e^{-qy}\ \frac{(-qsinby - bcosby)}{q^2 + b^2}\right\}\right]_0^\infty \left[e^{-px}\ \frac{(-psinax - acosax)}{p^2 + a^2}\right]_0^\infty$$

$$= \left[q^5 \left\{ \frac{b}{q^2 + b^2}\right\}\right]\left[\left\{ \frac{a}{p^2 + a^2}\right\}\right]$$

$$\boldsymbol{DL\{sinax\ sinby\} = \frac{abq^5}{(q^2 + b^2)(p^2 + a^2)}}$$

[B]

$$DL\{cosax\ cosby\} = q^5 \int_0^\infty \{cosax\ cosby\}\, e^{-(px+qy)}\, dxdy$$

$$= \left[q^5 \int_0^\infty e^{-qy}\ cosy\ dy\right]\left[\int_0^\infty e^{-px}\ cosax\ dx\right]$$

$$= q^5 \left[\left\{ e^{-qy}\ \frac{(-qcosby - bsinby)}{q^2+b^2}\right\}\right]_0^\infty \left[e^{-px}\ \frac{(-pcosax - asinax)}{p^2+a^2}\right]_0^\infty$$

$$= \left[q^5 \left\{ \frac{q}{q^2+b^2}\right\}\right]\left[\left\{ \frac{p}{p^2+a^2}\right\}\right]$$

$$\boldsymbol{DL\{cosax\ cosby\} = \frac{pq^6}{(q^2+b^2)(p^2+a^2)}}$$

[C]

$$DL\{sinhax\ sinhby\} = q^5 \int_0^\infty \{sinhax\ sinhby\}\, e^{-(px+qy)}\, dxdy$$

$$= \left[q^5 \int_0^\infty e^{-qy}\ sinhby\ dy\right]\left[\int_0^\infty e^{-px}\ sinhax\ dx\right]$$

$$= \left[q^5 \int_0^\infty e^{-qy}\ \left(\frac{e^{by}-e^{-by}}{2}\right) dy\right]\left[\int_0^\infty e^{-px}\ \left(\frac{e^{ax}-e^{-ax}}{2}\right) dx\right]$$

$$= \left[q^5 \int_0^\infty \frac{1}{2}\left\{ e^{-y(q-b)} - e^{-y(q+b)}\right\} dy\right] * \left[\int_0^\infty \frac{1}{2}\left\{ e^{-x(p-a)} - e^{-x(p+a)}\right\} dy\right]$$

$$= \frac{q^5}{2}\left[\left\{\frac{e^{-y(q-b)}}{-(q-b)} + \frac{e^{-y(q+b)}}{(q+b)}\right\}\right]_0^\infty * \frac{1}{2}\left[\frac{e^{-x(p-a)}}{-(p-a)} + \frac{e^{-x(p+a)}}{(p+a)}\right]_0^\infty$$

On solving, we get,

$$\boldsymbol{DL\{sinhax\ sinhby\} = \frac{abq^5}{(q^2-b^2)(p^2-a^2)}}$$

[D]

$$DL\{coshax\ coshby\} = q^5 \int_0^\infty \{coshax\ coshby\}\, e^{-(px+qy)}\, dxdy$$

$$= \left[q^5 \int_0^\infty e^{-qy}\ coshby\ dy\right] * \left[\int_0^\infty e^{-px}\ coshax\ dx\right]$$

$$= \left[q^5 \int_0^\infty e^{-qy}\ \left(\frac{e^{by}+e^{-by}}{2}\right) dy\right] * \left[\int_0^\infty e^{-px}\ \left(\frac{e^{ax}+e^{-ax}}{2}\right) dx\right]$$

$$= \left[\frac{q^5}{2}\left\{\frac{e^{-y(q-b)}}{-(q-b)} - \frac{e^{-y(q+b)}}{(q+b)}\right\}\right]_0^\infty * \left[\frac{1}{2}\left\{\frac{e^{-x(p-a)}}{-(p-a)} - \frac{e^{-x(p+a)}}{(p+a)}\right\}\right]_0^\infty$$

$$= \left[\frac{q^5}{2}\left\{\frac{1}{(q-b)} + \frac{1}{(q+b)}\right\}\right] * \left[\frac{1}{2}\left\{\frac{1}{(p-a)} + \frac{1}{(p+a)}\right\}\right]$$

On solving, we get,

$$\boldsymbol{DL\{coshax\ coshby\} = \frac{pq^6}{(q^2-b^2)(p^2-a^2)}}$$

[E]

$$DL\{x^n y^n\} = q^5 \int_0^\infty \int_0^\infty x^n y^n\, e^{-(px+qy)}\, dxdy$$

$$DL\{xy\} = \left[q^5 \int_0^\infty y^n e^{-qy}\, dy\right]\left[\int_0^\infty x^n e^{-px}\, dx\right]$$

$$= \left[q^5\left\{\frac{n}{q}\int_0^\infty y^{n-1} e^{-qy}\, dy\right\}\right] * \left[\frac{n}{p}\int_0^\infty x^{n-1} e^{-px}\, dx\right]$$

$$= \left[q^5\left\{\frac{n}{q}.\frac{n-1}{q}\int_0^\infty y^{n-2} e^{-qy}\, dy\right\}\right] * \left[\frac{n}{p}.\frac{n-1}{p}\int_0^\infty x^{n-2} e^{-px}\, dx\right]$$

Expand up to n terms

$$= \left[q^5\left\{[n(n-1)(n-2)\ldots\ldots 2.1]\frac{1}{q^n}\int_0^\infty e^{-qy}\, dy\right\}\right]$$
$$* \left[[n(n-1)(n-2)\ldots\ldots 2.1]\frac{1}{p^n}\int_0^\infty e^{-px}\, dx\right]$$

$$= \left[n!\frac{1}{q^n}\frac{1}{q}\right]\left[n!\frac{1}{p^n}\frac{1}{p}\right]$$

$$= \left[n!\frac{1}{q^{n+1}}\right]\left[n!\frac{1}{p^{n+1}}\right]$$

$$\boldsymbol{DL\{x^n y^n\} = \frac{(n!)^2 q^{n+2}}{q^{n+1}.p^{n+1}}}$$

Outcomes:

In this project, we present a new approach called Aftab Alam-Laplace transform for obtaining Aftab Alam-Laplace transform of some significant functions. It may be finished that the technique is accomplished for obtaining Aftab Alam-Laplace transform of some significant functions.

S. No.	$DL\{f(x,y)\}$	$\bar{f}(q,p)$
1.	$DL\{x^n y^n\}$	$\frac{(n!)^2 q^{n+2}}{q^{n+1}.p^{n+1}}$
2.	$DL\{sinax\ sinby\}$	$\frac{abq^5}{(q^2+b^2)(p^2+a^2)}$
3.	$DL\{cosax\ cosby\}$	$\frac{pq^6}{(q^2+b^2)(p^2+a^2)}$
4.	$DL\{sinhax\ sinhby\}$	$\frac{abq^5}{(q^2-b^2)(p^2-a^2)}$
5.	$DL\{coshax\ coshby\}$	$\frac{pq^6}{(q^2-b^2)(p^2-a^2)}$

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PERFORMA FOR PROJECT COMPLETION REPORT

To,
Head of Department
Name of Department:
Name of College: KVSCOS

Date: 16/12/2020

Findings of the project: (Max-100 words): In this project, we present a new approach called aftab alam laplace transform for obtaining Aftab Alam laplace transform of some significant functions. It has been finished that the technique is accomplished for obtaining Aftab-Alam-Laplace transform of some significant functions.

Extent of Support: Support Enlisted from Gyan Vigyan Sansthan

Name of PI: Dr. Aftab Alam
Name of the Department: Mathematics
Name of College: KVSCOS
Title of the Project: "AFTAB-ALAM-laplace transform of some monotone functions"
Duration of the Project:

Signature of the PI:
Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

Cover Page

Project Title

"Generalized Skew Derivations on Rings with Involution"

SWAMI VIVEKANANDA
SUBHARTI UNIVERSITY

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"Generalized Skew Derivations on Rings with Involution"

Objective:- In this project we investigate the structure of a ring R with involution of second kind admitting a generalized skew-derivation G satisfying one of the following:

(i) $G([x,x^*])+[x,x^*]\in Z(R)$

(ii) $G(x\circ x^*)\in Z(R)$

(iii) $G([x,x^*])\mp x\circ x^*\in Z(R)$

(iv) $G(x\circ x^*)\mp x\circ x^*\in Z(R)$

(v) $G(x\circ x^*)\mp [x,x^*]\in Z(R)$ for all $x\in R$.

Introduction:- Throughout the project, R will represent an associative ring with center Z(R). For any $x,y\in R$ the symbol [x,y] will denote the commutator xy-yx; while the symbol $x\circ y$ will stand for anti-commutator xy+yx. R is prime if aRb=0 implies a=0 or b=0. An additive map $*:R\to R$ is called an involution if * is an anti-automorphism of order 2; that is $(x^*)^*=x$ for all $x\in R$. R is *-prime if aRb*=0 implies a=0 or b=0. An element x in a ring R with involution * is said to be hermitian and skew-hermitian elements of R will be denoted by H(R) and S(R), respectively. The involution is said to be of the firest kind if $Z(R)\subseteq H(R)$, otherwise it is said to be of second kind. In the later case $Z(R)\cap S(R)\neq(0)$. An additive mapping $d:R\to R$ is said to be a derivation if d(xy)=d(x)y+xd(y) for all $x,y\in R$. An additive map $F:R\to R$ is a generalized derivation if their exists a derivation d such that F(xy)=F(x)y+xd(y) for all $x,y\in R$. All derivations are generalized derivations.

Let R be an associative ring and α be an automorphism of R. An additive mapping $D:R\to R$ is called a skew-derivation of R if $D(xy)=D(x)y+\alpha(x)D(y)$ for all $x,y\in R$ and α is called an associated automorphism of D. An additive mapping $G:R\to R$ is said to be a generalized skew-derivation of R if there exists a skew-derivation D of R with associated automorphism α such that $G(xy)=G(x)y+\alpha(x)D(y)$ for all $x,y\in R$. The definition of generalized skew-derivation is a unified notion of skew-derivation and generalized derivation, which are considered as classical additive mappings of non-associative algebras. The behaviour of these has been investigated by many researchers from various views, see [1-5]. In [6, Theorem 2], Daif and Bell proved that if R is a semiprime witha nonzero ideal I and d is a derivation of R such that $d([x,y]=[x,y]$ for all $x,y\in I$, then $I\subseteq Z(R)$. In particular if R is a prime ring, then R must be commutative. Recently in [7] Filippis and Huang studied the situation $(F([x,y]))^n=[x,y]$ for all $x,y\in I$, where I is a nonzero ideal in a prime ring R, F is a generalized derivation of R and $n\geq 1$, a fixed integer. In this case they conclude that either R is commutative or n=1: d=0 and F(x)=x for all $x\in R$.

Motivated by the aforementioned results in this project we prove some theorems for a generalized skew-derivation of a ring with involution of second kind.

Fact 1: Let R be a prime ring of characteristic not 2 with involution * of second kind. If R is prime and $S(R)\cap Z(R)\neq(0)$, then D(h)=0 for all $h\in H(R)\cap Z(R)$ implies that D(z)=0 for all $z\in Z(R)$. Indeed, if D(h)=0 for all $h\in H(R)\cap Z(R)$, replacing h by k^2 where $k\in S(R)\cap Z(R)$, then we have D(k)k=0 for all $k\in S(R)\cap Z(R)$ since α is an automorphism. As conclusion, we get D(z)=0 for all $z\in Z(R)$.

Example 2.6 Let R=$\left\{\begin{pmatrix} a & b \\ 0 & 0 \end{pmatrix} a,b,c \in Z, ring\ of\ integers\right\}$. Define maps G,D,$\alpha$:R→R by $G\left(\begin{pmatrix} a & b \\ 0 & 0 \end{pmatrix}\right) = \begin{pmatrix} a & 0 \\ 0 & 0 \end{pmatrix}, D\left(\begin{pmatrix} a & b \\ 0 & 0 \end{pmatrix}\right) = \begin{pmatrix} 0 & -b \\ 0 & 0 \end{pmatrix}$, $\alpha\left(\begin{pmatrix} a & b \\ 0 & 0 \end{pmatrix}\right) = \begin{pmatrix} a & b \\ 0 & 0 \end{pmatrix}$ and $\begin{pmatrix} a & b \\ 0 & 0 \end{pmatrix}^*S = \begin{pmatrix} 0 & -b \\ 0 & a \end{pmatrix}$.

Then G is a generalized skew derivation associated with a skew derivation D and an automorphism α on R with an involution * of first kind satisfying: (i) $G([x,x^*])+[x,x^*] \in Z(R)$, (ii) $G(x\circ x^*) \in Z(R)$, (iii) $G([x,x^*])\mp x\circ x^* \in Z(R)$, (iv) $G(x\circ x^*)\mp x\circ x^* \in Z(R)$, (v) $G(x\circ x^*)\mp[x,x^*] \in Z(R)$ for all $x \in R$. However, R is not commutative.

Conclusion:- :- In this project, we find the different type of structure of a ring R with involution of second kind admitting a generalized skew-derivation G satisfying one of the following:

(i) $G([x,x^*])+[x,x^*]\in Z(R)$
(ii) $G(x\circ x^*)\in Z(R)$
(iii) $G([x,x^*])\mp x\circ x^*\in Z(R)$
(iv) $G(x\circ x^*)\mp x\circ x^*\in Z(R)$
(v) $G(x\circ x^*)\mp [x,x^*]\in Z(R)$

for all $x\in R$.

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PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 26.03.21

Head of Department

Name of Department: Mathematics

Name of College: KVSCOS

Findings of the project: (Max-100 words):

We investigate the structure of a ring R with involution of second kind admitting a generalized skew derivation, which satisfy the identities :- (i) $G[x,x^*] \pm [x,x^*] \in Z(R)$, (ii) $G(xox^*) \mp xox^* \in Z(R)$ etc.

External Signature: Gyan Vigan Sarthak

Name of PI: Dr. Kapil Kumar

Name of the Department: Mathematics

Name of College: KVSCOS

Title of the Project: Generalized Skew Derivations on Rings with Involution

Duration of the Project:

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

Cover Page

Project Title

Subsets in *Sequence*

An Investigation into Changing Places

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SUBHARTI UNIVERSITY

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Subsets in *Sequence*

An Investigation into Changing Places

Statement : These set $\{a, b, c\}$ has exactly eight subsets.

1. List all the subsets of $\{a, b, c\}$.
2. Now arrange those subsets in a sequence so that each subset in the sequence differs from the one before it in one of two ways:
    - One new element is inserted:
      Example 1: $\{a\}$, $\{a, b\}$
      Example 2: $\{a, b\}$, $\{a, b, c\}$
    - One old element removed
      Example 1: $\{a, b, c\}$, $\{a, c\}$
      Example 2: $\{b\}$,
3. Can you create more than one sequence that fits these criteria?
4. Create a listing like this for the subsets of $\{a, b, c, d\}$.
5. Describe a general method (or explain why there isn't one) for creating such a sequence of the subsets of any set $\{a_1, a_2, a_3, ...a_n\}$.

Prerequisites for the Subsets in Sequence Problem

There are no essential prerequisites for solving this problem. An understanding of what a set is ("a collection of objects" is a sufficient definition) and what a subset is (any set all of whose elements come from the original set, including --the empty set--and the whole set) is enough to get started.

Familiarity with graph theory and recursive definitions for functions or algorithms will help in the final solution, but those ideas can be picked up through working on the problem.

Warm Ups for the Subsets in Sequence Problem

•The set $\{a\}$ has two subsets--$\{a\}$ and . Is it possible to list them in sequence so that each new subset differs from the one before it by adding or subtracting one element?

•How many subsets does $\{a, b\}$ have? Can you list them all? Can you list them in the order required?

•How many subsets does the n-element set $\{a_1, a_2, ..., a_n\}$ have?

•Can you arrange the subsets of $\{a, b\}$ in a diagram that shows which subset is contained in another? How about for $\{a, b, c\}$?

Note!
We do not include results for these warm up problems on the Making Mathematics Web site.

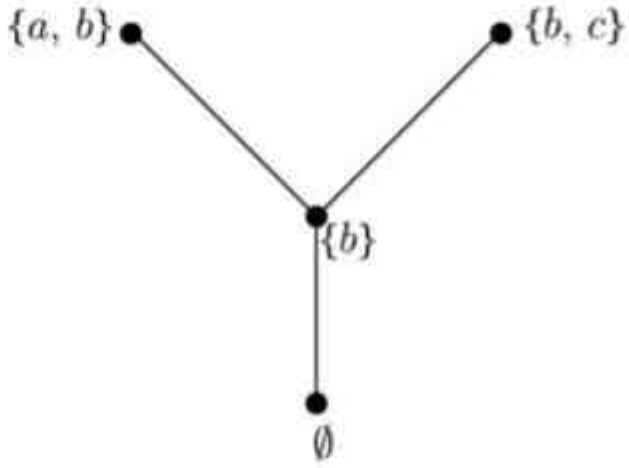
Hints for the Subsets in Sequence Problem

1. Note that the subsets of $\{a\}$ are and $\{a\}$. No matter how you list them, they fit the rule. Now try working with the subsets of a two-element set. (These problems are suggested
2. See if you can use a sequence of subsets for an $(n\text{-}1)$-element set to obtain a sequence for an n-element set. For example:

   Subsets of $\{a\}$: , $\{a\}$
   Subsets of $\{a, b\}$: , $\{a\}$, $\{b\}$, $\{a, b\}$

   The second sequence doesn't fit the rule; can you "build off" the first sequence in some way that helps you rearrange the second sequence so that it **will** fit the rule? Once you do that, can you use a similar technique on the (rule-fitting) second sequence to create a list for $\{a, b, c\}$ that works?

3. Draw a picture where each subset is connected by an edge to all of the subsets it could move to next. For example, from the subset $\{b\}$ of $\{a, b, c\}$, one can move to the sets , $\{a, b\}$, and $\{b, c\}$; the picture might look like this:



   In this picture, moving down gives you a subset (one element is removed) and moving up gives you a superset (one element is added). Try to extend this picture to include all of the subsets of $\{a, b, c\}$. How can you use this diagram to produce a sequence of subsets that follow the rules?

Resources for the Subsets in Sequence Problem

Ideas about graph theory and, in particular, about things called "Hamiltonian paths" are helpful in solving this problem. (See for a short description of Hamiltonian paths.)

Online resources on graph theory include:

- "The Mathematics of Graphs and their Games" at This site provides a thorough and accessible introduction to the ideas and terminology of graph theory as well as classroom lesson plans for elementary students on up.
- "Graphs" atThis site discusses introductory graph theory ideas and provides an interactive graph-making tool.

Almost any book on graph theory, including many "discrete math" texts, will talk about Hamiltonian paths in a graph.

- Bondy, J. A. and Murty, U. S. R. (1996). Graph Theory with Applications. New York: Elsevier Science Publishers.
- Goodaire, E. G. and Parmenter, M. M. (1998). Discrete Mathematics with Graph Theory. New Jersey: Prentice Hall.
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Information on proof by mathematical induction is also helpful for this project.

Teaching Notes for the Subsets in Sequence Problem

There are many ways to organize work on this project, depending on the background and focus of your class. What follows are some ideas for getting started and progressing through the work with classes of a few different backgrounds.

Introducing the Project

If your class has a background in computer science or has a programming focus, you may want to start with the context of a new ordering of the binary numbers (see the to motivate work on the project. Students can play with the problem of re-ordering the binary numbers for a few minutes; you can then explain that solving a problem in a different context will actually help them solve the binary number problem. Then, introduce the subsets problem as stated

If your class has a background in combinatorics, they may have studied ways to count subsets. You can lead into this project by asking them how many subsets a set of three, four, or n elements has. A natural follow-up question is, "Suppose I don't just want to know how many; I actually want to write them all down. How could I do it?" Students will probably suggest something like, "List all the one-element subsets first, then the two-element subsets, and so on." You can push them to refine this method so that they know (for example) when they have listed all the two-element subsets without repeating any or leaving any out. This will probably take most of a class day or more, if you allow students to refine and generalize their methods for listing all the subsets of an n-element set. Finally, explain that you want to put a new constraint on the listing of the subsets: As you move from one to the next on your list, you want to add one new element or remove one old element. Suggest that they start by working on sets with small numbers of elements (one, two, three, or four), with the goal of creating a general method for finding such a listing.

If your class has no background in the ideas presented here, that's fine; just start a few steps back. Review what a set is (simply "a collection of objects" will do) and what a subset is (any set of elements that all come from the original set, including --the empty set--and the whole set). Make sure students understand that in a description of a set, the order of the elements does not matter (i.e., the sets $\{a, b\}$ and $\{b, a\}$ are the same). This will be a potential cause for confusion later in the project, since the **order the subsets are listed** will matter, but the **order of objects listed within a subset** does not.

Ask students how many subsets there are of the set $\{a, b, c\}$, and let them work on that question for quite a while. Students without a background in combinatorics will likely try to come up with a strategy for listing all the subsets, which is fine, since creating a particular kind of listing is the point of this project. Give students plenty of time to work on this problem, and ask them to convince themselves that they have not left off any subsets or listed any twice. Finally, ask several students to share their strategies with the whole class.

You may find that students will omit and the complete set $\{a, b, c\}$ in their listing. You can explain that is a subset of **any** set at all, and that the whole set indeed fits the definition of subset. (If students resist calling the whole set a subset of itself, you may want to introduce the term "proper subset"; explain that it is an important distinction they are making, and one that mathematicians care about as well.)

You may want to spend a couple of days on work like this (i.e., counting and listing all the subsets for sets of one, two, three, and four elements). Before digging in to the project work, it would help students to know that there are 2^n subsets for a set with n elements and to be able to reason why that is--either through a recursive argument of building up bigger and bigger sets and seeing the number of subsets double, or through a more combinatoric argument that each element is either in or

not in a given subset, giving 2^n possible choices (two for each of the n elements). It's also helpful to know that the subsets can be split exactly in half by considering "sets that contain x" and "sets that don't contain x," where x is an element of the original set. All of this will likely come up in the course of working on the project, so it's up to you how much time you want to spend up front exploring sets, subsets, counting, and listing.

Working on the Project

Depending on how familiar students are with finding recursive solutions, this project may take anywhere from a couple of days to several weeks of class time. After students have had a day or so to come up with a suitable listing (or several suitable listings) for sets of three elements, ask them to work with other small sets, with the explicit goal of finding a general method. If students are struggling with sets of four and five elements, you may want to spend one day of class time on the talking explicitly about how to move from a set with one element to a set with two, from two to three, and so on.

If students work on the warm up problems, you may also want to introduce the graph-theoretic approach to the problem, and ask students to work on finding Hamiltonian paths (a path that visits each vertex exactly once) along other graphs to get used to the ideas there.

Closure

Once students have convinced themselves that they can always find a sequence that works, there are many options for bringing closure to the activity:

- Ask students or student groups to present their different approaches to the class or write a final paper. A nice touch is to ask students to include some early work in the final product, to explain how they initially thought about the problem and how their thinking evolved.
- For students who can program, a nice final product is a program that will take as input either a set or a number of elements in a set and output the desired sequence of subsets. Note that a programming language with some list-processing capabilities (Mathematica, LISP, or even Logo) makes this task much easier!
- If you started with the question about binary numbers, have your students return to that question and see how the listing of subsets allows them to create such an ordering for the binary numbers.
- Have each student take a different to work on for a week or more on their own, and then present their solution to--or at least progress on--that problem to the class. (This is particularly nice, because it reduces redundancy in the presentations.)

Extensions for the Subsets in Sequence Problem

Write a Program

- Write a computer program to list all the subsets of a set (input by the user) in the order described in this problem.

Hamiltonian Paths

A Hamiltonian path, named for the mathematician William Rowan Hamilton (1805 - 1865), is one that visits every vertex in a graph exactly once. A Hamiltonian **cycle** also visits every vertex exactly once but has the additional property that the first vertex and the last vertex in the path are adjacent (so you could follow an edge and start again at the beginning).

- For the graphs created by the subsets problem, how many Hamiltonian paths are there? How many total paths are there? Is there always a Hamiltonian cycle?
- Is there a Hamiltonian cycle on a soccer ball?
- In a round-robin tournament, each team plays every other team exactly once. Rankings are decided by looking at the win/loss record of each team. Suppose that n teams play p round-robin tournaments with no tie games. Prove that there is an order of the teams $t_1, t_2, \ldots, t_n$ so that t_i beat t_{i+1} for $i = 1, 2, \ldots, (n - 1)$.

A New Binary Number System

The subsets problem is connected to a real problem in computer science. Computers keep track of information using binary numbers made up of 0's and 1's. These 0's and 1's are really "switches" with on and off (or high- and low-voltage) positions. When a computer counts in binary numbers, sometimes only one of the switches has to change position. For example, in going from 100 to 101, only the last digit is different. However, sometimes many switches have to change position. For example, going from 111 to 1000 requires all four digits to switch.

These switch changes can't really happen simultaneously--the digits will flip at slightly different times. For example, you could picture the change from 111 to 1000 happening this way: 111 → 1111 → 1110 → 1100 → 1000. Not until the final digit changes is the number correct. This is inefficient and could cause errors if the data is read "mid-flip."

A more efficient (and safer) version of the binary number system would solve this problem.

- Come up with a new binary number system--a way to code numbers with just 0's and 1's so that in moving from one number to the next, you only need to change one digit. Note: The bits may not have their customary place value.
- Write a computer program to do arithmetic in your new binary number system, or to convert between your binary number system and the decimal system.

Results from the Subsets in Sequence Problem

Three-Element Set

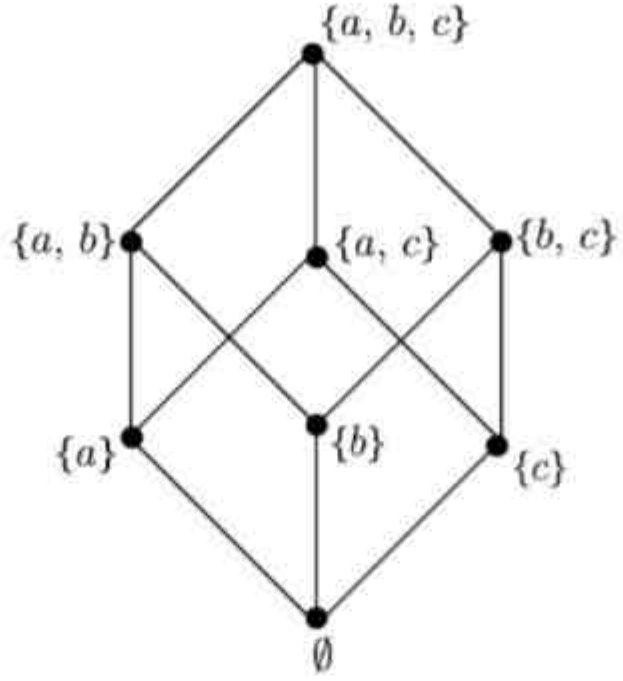
The subsets of $\{a, b, c\}$ are , $\{a\}$, $\{b\}$, $\{c\}$, $\{a, b\}$, $\{a, c\}$, $\{b, c\}$, $\{a, b, c\}$.

For the case of a three element set, there are many appropriate sequences, which you could discover by trial and error. Here are a few examples of sequences that satisfy the given conditions:

- , $\{a\}$, $\{a, c\}$, $\{a, b, c\}$, $\{a, b\}$, $\{b\}$, $\{b, c\}$, $\{c\}$
- $\{c\}$, $\{b, c\}$, $\{b\}$, $\{a, b\}$, $\{a, b, c\}$, $\{a, c\}$, $\{a\}$,
- , $\{a\}$, $\{a, b\}$, $\{b\}$, $\{b, c\}$, $\{c\}$, $\{a, c\}$, $\{a, b, c\}$

(Note that the second sequence is simply the first sequence written backward. Will this always work?)

A pictorial approach to this problem uses a **graph** whose vertices are the subsets of a three-element set; an edge connects two subsets that differ by exactly one element. This yields the following figure:



At this point, you might want to trace the sequences given above in this figure. Can you use the figure to discover a different sequence? How about a different one that starts with ?

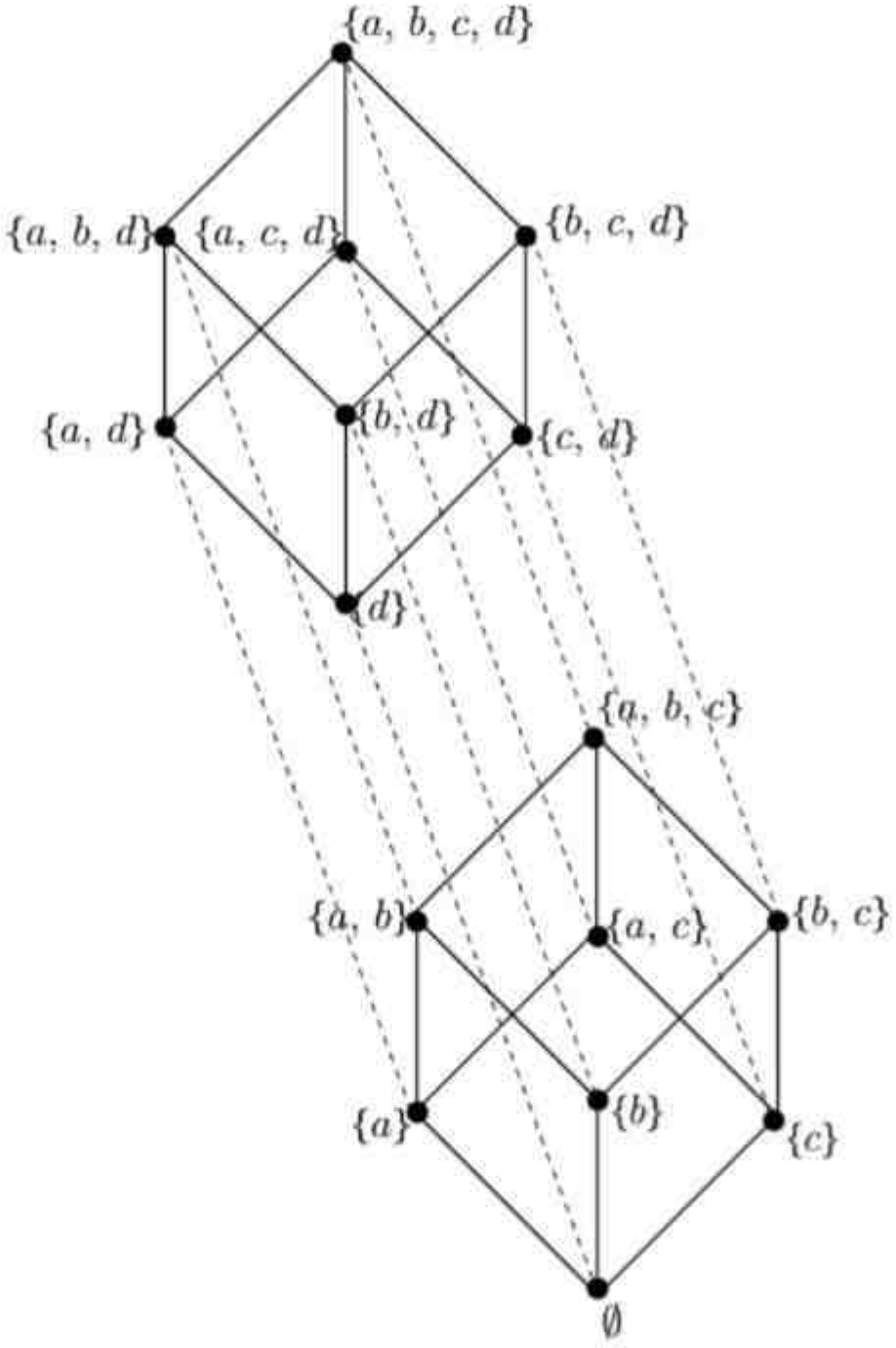
In terms of graph theory, we are looking for a "path," i.e., a sequence of distinct vertices, each one connected to the vertex before and after it. Furthermore, we want each vertex in the graph to appear exactly once in the sequence. Such a path is generally known as a "Hamiltonian path." (See for a short description of Hamiltonian paths.)

Four-Element Set

A four-element set has 16 subsets, and it gets harder to find the appropriate sequences by trial and error. Here are two ways to list the subsets of a four-element set:

- , {a}, {a, c}, {a, b, c}, {a, b}, {b}, {b, c}, {c},
  {c, d}, {b, c, d}, {b, d}, {a, b, d}, {a, b, c, d}, {a, c, d}, {a, d}, {d}
- {d}, {a, d}, {a, c, d}, {a, b, c, d}, {a, b, d}, {b, d}, {b, c, d}, {c, d},
  {c}, {b, c}, {b}, {a, b}, {a, b, c}, {a, c}, {a},

The graph for a four-element set can be thought of as a hypercube--a four-dimensional cube. But you can think of all the subsets as split into two groups: those subsets that contain *d* and those that don't. The first group is simply the subsets of {*a*, *b*, *c*}, which we know well by now. The second group is all the subsets of {*a*, *b*, *c*}, with the element *d* added to each subset. You can think of two cubes like this:



The dashed lines show how the two cubes connect--corresponding vertices of the two cubes are connected to each other because they differ by only one element: *d*. Here's an argument that you can trace around this new hypercube, based on the fact that you **know** you can trace around a three-dimensional cube:

1. Start at any point on the cube representing the set $\{a, b, c\}$ and trace around the cube in such a way that you visit each vertex exactly once.
2. You will end on a different vertex of the same cube. From that vertex, traverse the dashed line to the other cube.
3. Now, trace around the second cube in such a way that you visit each vertex exactly once. Since the second cube is equivalent to the first one (it just has

different labels on the vertices), you will be able to do this. (In fact, one way to do it is to just reverse the path of the first cube. This creates a cycle in which the last vertex in the sequence is adjacent to the first vertex in the sequence. Can you see why?)

Following these directions creates a path that visits every vertex of the hypercube exactly once. Try it!

General Method

To come up with a general method for creating the sequence, it helps to consider the problem of getting from one set to a larger set, building on listings you've already made. This problem easy to solve for a one-element set

$$\emptyset, \{a\}$$

(You can also flip them . . . it doesn't matter).

To solve the problem for a two-element set, repeat the previous list, then do it again in reverse order, adding b to each subset. So now you have:

$$\emptyset, \{a\}, \{a, b\}, \{b\}$$

To solve it for a three-element set, do it again: re-list everything above, then list the subsets again, in reverse order, adding c to each:

$$\emptyset, \{a\}, \{a, b\}, \{b\}, \{b, c\}, \{a, b, c\}, \{a, c\}, \{c\}$$

You can solve the problem for any n-element set with this recursion.

Here's one description of a general recursive method. To create the sequence for a set with n elements, you have to first create it for a set with n - 1 elements. To create the listing for a set with n - 1 elements, you must first create the listing for a set with n - 2 elements (and so on).

Suppose you have a set $S = \{a_1, a_2, \ldots, a_n\}$ that has n elements. Here's what you do:

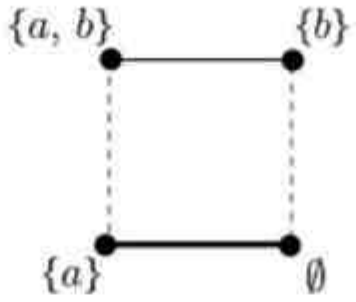
1. Discard one element of your set (we'll use a_n), leaving you with a set $S' = \{a_1, a_2, \ldots, a_{n-1}\}$, that has n - 1 elements.
2. Write out the sequence of subsets for your new set S'.
3. Write the same sequence of subsets for S', but write it backward and add the element a_n to each subset.
4. Put the two sequences together, and you will have an appropriate sequence of subsets for S.

Let's take a look at how that works in practice. Suppose we have the set $S = \{a, b, c, d, e\}$. Here's how it goes:

1. Discard one element of your set (we'll use e), so $S = \{a, b, c, d\}$.
2. We've already made the sequence for S. (If we hadn't, we'd have to go back to Step 1, creating $S = \{a, b, c\}$ and so on until we get a set small enough to work with.) Here's one of the listings we made:
   $\{\}, \{a\}, \{a, c\}, \{a, b, c\}, \{a, b\}, \{b\}, \{b, c\}, \{c\},$
   $\{c, d\}, \{b, c, d\}, \{b, d\}, \{a, b, d\}, \{a, b, c, d\}, \{a, c, d\}, \{a, d\}, \{d\}$
3. Write the sequence backward:
   $\{d\}, \{a, d\}, \{a, c, d\}, \{a, b, c, d\}, \{a, b, d\}, \{b, d\}, \{b, c, d\}, \{c, d\},$
   $\{c\}, \{b, c\}, \{b\}, \{a, b\}, \{a, b, c\}, \{a, c\}, \{a\},$
4. Add the element e to each subset in that sequence:
   $\{d, e\}, \{a, d, e\}, \{a, c, d, e\}, \{a, b, c, d, e\}, \{a, b, d, e\}, \{b, d, e\}, \{b, c, d, e\}, \{c, d, e\},$
   $\{c, e\}, \{b, c, e\}, \{b, e\}, \{a, b, e\}, \{a, b, c, e\}, \{a, c, e\}, \{a, e\}, \{e\}$
5. Put the two sequences together:
   $\{\}, \{a\}, \{a, c\}, \{a, b, c\}, \{a, b\}, \{b\}, \{b, c\}, \{c\},$
   $\{c, d\}, \{b, c, d\}, \{b, d\}, \{a, b, d\}, \{a, b, c, d\}, \{a, c, d\}, \{a, d\}, \{d\},$
   $\{d, e\}, \{a, d, e\}, \{a, c, d, e\}, \{a, b, c, d, e\}, \{a, b, d, e\}, \{b, d, e\}, \{b, c, d, e\}, \{c, d, e\},$
   $\{c, e\}, \{b, c, e\}, \{b, e\}, \{a, b, e\}, \{a, b, c, e\}, \{a, c, e\}, \{a, e\}, \{e\}$

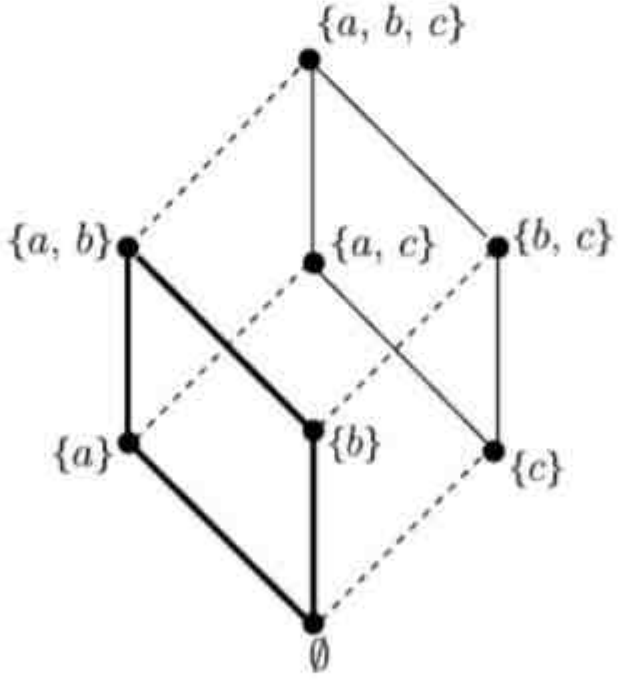
You can also create a general version of the graphical approach to the problem. Once again, start with smaller cases and look at how you can build a solution for a set with n elements from a solution for a set with $n - 1$ elements. In general, it is not easy to tell if a graph has a Hamiltonian path (a path that visits each vertex exactly once). But because each graph for this problem is connected in a predictable way to the previous graph, we can show that the graphs will all have (many) Hamiltonian paths.

For the case $n = 1$, the graph is a line segment. For $n = 2$, the graph is a square, which can be built from two copies of the line segment, connected to each other in a prescribed way. In this case, we create the new line segment by adding b to each existing subset; then we connect the corresponding vertices with dashed lines. Note that all of the vertices in this new graph follow the rule that two vertices are connected if and only if they differ by one element (i.e., have one element removed or added):



You can start at either vertex of the original segment, move to the other vertex, then move across a dashed segment to the new "containing b" segment, and then finally move across to the other vertex of that segment.

If you look closely at the $n = 3$ graph, you will notice that it is exactly the same as the vertices and edges of a cube! One way to draw a cube is to draw two copies of a square, then connect the corresponding points with edges. There are many ways to view such a cube as being made from squares, but one way is draw the square of subsets that do **not** contain c (emphasized with darker line segments in the picture), and the square of subsets that **do** contain c, and then connect each pair of subsets that differ only by c (the dashed segments in the picture).



We now have a way to "lift" a solution for $n = 2$ to a solution for $n = 3$. Go around three edges of the first square (visiting all four vertices), then move to the other square along a dashed segment and go around three edges of that square. Any way you do this will give a solution to the $n = 3$ problem. For example:

- , $\{a\}$, $\{a, b\}$, $\{b\}$, $\{b, c\}$, $\{a, b, c\}$, $\{a, c\}$, $\{c\}$
- , $\{a\}$, $\{a, b\}$, $\{b\}$, $\{b, c\}$, $\{c\}$, $\{a, c\}$, $\{a, b, c\}$

We've already shown above how to take the solution for $n = 3$ and create the "hypercube" solution for $n = 4$. Here's a proof that you can always find a path, using

- I can solve the problem for $n = 1, 2, 3, 4$. That is, I can create a graph for the problem and find a Hamiltonian path around that graph.
- To create the graph for n, I make two copies of the graph for n-1. One of the copies, I leave as is. The other copy, I add the new nth element to each subset at a vertex of that graph. I then connect corresponding vertices of the two $(n - 1)$ graphs with dashed line segments.
- To traverse the n graph with a Hamiltonian path, I first traverse one of the $(n - 1)$ graphs with a Hamiltonian path. I then travel along a dashed line segment to the second $(n - 1)$ graph. Finally, I traverse that second graph with a Hamiltonian path.

PERFORMA FOR PROJECT COMPLETION REPORT

11.08.2021

To,

Date:

Head of Department

Name of Department: Mathematics

Name of College: KVSCOS

Findings of the project: (Max-100 words): In the case of three element set there are many appropriate sequences which discover by trial and error a pictorial approach to this problem uses a graph whose vertices are the subset of three element set an edge connects two subset that differ by exactly one element

External Support:
Supported by Gyan Vigyan Sansthan for consumables

Name of PI: Dr Rajiv

Name of the Department: Mathematics

Name of College: KVSCOS

Title of the Project: Subset of Sequence

Duration of the Project:

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

A comparative study of the efficacy and safety of Oral Methotrexate versus Oral Methotrexate with Apremilast in patients with Moderate to Severe Chronic Plaque Psoriasis

Research Proposal Submitted

By

Dr. ARVIND KRISHNA

Department of Dermatology, Venereology and Leprosy

Subharti Medical College

INTRODUCTION

Psoriasis is a group ofcommon chronic inflammatory and proliferative conditions of the skin, associated with systemic manifestations in many organ systems. The most characteristic lesions consist of red, scaly, sharply demarcated, indurated plaques, present particularly over the extensor surfaces and scalp. The extent and severity vary enormously over time and between individuals. Both genetic and environmental influences have a critical role in the etiology and pathogenesis.[1]

It is characterized by hyper proliferation and abnormal differentiation of epidermal keratinocytes, lymphocyte infiltration, mostly of T-lymphocytes and endothelial vascular changes in the dermal layer such as angiogenesis and dilatation.[2]

Topical therapy, Phototherapy, conventional systemic, and biological therapies offer excellent options of treatment for psoriasis. The commonly used topical medications for psoriasis are corticosteroids, vitamin D3 analogues, anthralin derivatives, topical retinoids, coal tar, and calcineurin inhibitors. Phototherapy with broadband or narrowband ultraviolet B (UVB) and photochemotherapy with ultraviolet A (UVA) can be used for treatment of Psoriasis. methotrexate, cyclosporine, systemic retinoids, apremilast, mycophenolatemofetil and

biological agents such as adalimumab, infliximab etc. are also widely used in the treatment of Psoriasis.[3]

Methotrexate is an antimetabolite drug which was initially used for treatment of cancer. In the 1950s it was found to be also effective in clearing psoriasis and was thereby approved for its use by the FDA in 1970s. It mainly acts as an inhibitor of DNA synthesis by blocking dihydrofolicreductase enzyme so that it helps to prevent reproduction of the cells in the lesions and thus the function of the skin returns back to normal. [4]

Apremilast is a new drug which is taken orally for treatment of conditions like psoriasis and psoriatic arthritis. It selectively targets the molecules which are inside the immune cells of the body. It acts by adjusting the complicated processes of inflammation within the cell, thereby correcting the overactive immune response that causes inflammation in people with psoriatic disease, leading to improvement in scaling as well as joint tenderness and swelling.

It is an oral phosphodiesterase type 4 inhibitor (PDE4) which works intracellularly and helps to regulate various inflammatory mediators, including pathwayswhich are relevant for the pathogenesis of psoriasis.[5] PDE4 inhibition elevates intracellular cyclic adenosine monophosphate, which in turn downregulates the inflammatory responses and modulates production of anti-inflammatory cytokines.

The extent of clinical severity of the disease is assessed by the Psoriasis Area and Severity Index (PASI). The PASI score ranges from 0 (no psoriasis) to 72 (very severe psoriasis), and it is normally regrouped into two categories implying two severity levels of psoriasis: PASI < 10 (mild psoriasis) and PASI $\geq$ 10 (moderate to severe Psoriasis).[6]

AIMS AND OBJECTIVES

To study the efficacy of oral Methotrexate versusoral Methotrexatewith Apremilastin patients with moderate to severe chronic plaque psoriasis.

To study the safety of oral Methotrexate versusoral Methotrexatewith Apremilastin patients with moderate to severe chronic plaque psoriasis.

MATERIALS & METHOD

STUDY DESIGN

A prospective study involving a minimum of 40 patients, of both sexes, of psoriasis diagnosed clinically from the outpatient department of Dermatology, Venereology and Leprosy of ChhatrapatiShivaji Subharti Hospital, Meerut will be conducted within 2 years of approval by the university (From October 2019 to September 2022). Ethical committee clearance will be obtained.

SAMPLING TYPE: Purposive Sampling

SAMPLE SIZE

A minimum of 40 patients, of both sexes, of psoriasis will be divided into two groups **of 20 each**, A and B. Group A will be treated with oral Methotrexate while Group B will be treated with a combination of oral Apremilast and

INCLUSION CRITERIA FOR PATIENTS:

1. A patient with clinically confirmed Chronic plaque psoriasis patients with a Psoriasis Area and Severity Index (PASI) score of 10 or higher.
2. Patients aged 18 years or older;
3. Patients willing to give consent to participate and to undergo required investigations and treatment.

EXCLUSION CRITERIA FOR PATIENTS:

1. Patients below 18 years of age
2. Any non-consenting patient
3. Pregnant and lactating females
4. Patients having acute illness such as fever, malignancy, history of chest pain of cardiac origin, systemic or disseminated infection,
5. Subjects with known chronic diseases i.e. Tuberculosis, Any apparent signs of acute or chronic inflammation, Liver or renal problems, Excessive alcohol consumption.
6. Patients having severe mental illness.
7. A patient with clinically confirmed Pustular Psoriasis/Guttate Psoriasis/Erythrodermic Psoriasis
8. Patients on allopathic treatment for Psoriasis in the past 3 months.
9. Patients on Phototherapy for Psoriasis

METHODS

After the purpose and the contents of the study have been fully explained to the subjects, written informed consent will be obtained from all patients fulfilling the inclusion criteria.

HISTORY

A detailed history with special emphasis on psoriasis including age at onset, total duration, duration of present episode, remitting and relapsing factors, history of joint and nail involvement, and family history will be recorded on a pre-designed case record form. Patients will also be questioned regarding history suggestive of acute or chronic inflammatory diseases. History regarding diet (vegetarian or non-vegetarian), smoking index (number of cigarettes/bidis smoked per day multiply by number of years), alcohol consumption (quantity and duration), and drug history will also be elicited.

EXAMINATION

It will be followed by examination including morphological type of psoriasis.

Cutaneous examination will be accompanied by a complete general physical and systemic examination.

CLINICAL SEVERITY

The extent of clinical severity of the disease will be assessed by thepsoriasis area severity index (PASI) which is currently the gold standard score for the assessment of extensive psoriasis, but has the limitation of interobserver variation. ThePsoriasisAreaand Severity Index (PASI) is a quantitative rating score for measuring the severity of psoriatic lesions based on area coverage and plaque appearance.

Plaquecharacteristic	**Lesionscore**	**Head**	**UpperLimbs**	**Trunk**	**LowerLimbs**
Erythema	0=None 1=Slight 2=Moderate 3=Severe 4=Verysevere				
Induration/Thickness					
Scaling					
Addtogethereachofthe3scores foreachbodyregiontogive4 separatesums(A).					
LesionScoreSum(A)					

Percentagearea affected	**Areascore**	**Head**	**UpperLimbs**	**Trunk**	**LowerLimbs**
AreaScore(B) *Degreeofinvolvementasa percentageforeachbody regionaffected(scoreeach regionwithscorebetween 0-6)*	0=0% 1=1%-9% 2=10%-29% 3=30%-49% 4=50%-69% 5=70%-89% 6=90%-100%				

MultiplyLesionScoreSum(A)byAreaScore(B),for eachbodyregion,togive4individualsubtotals(C).				
Subtotals(C)				
Multiplyeachofthe Subtotals(C)byamountofbodysurfacearearepresented bythatregion,i.e.x0.1for head,x 0.2forupper body,x0.3for trunk, andx0.4for lowerlimbs.				
BodySurfaceArea	**x0.1**	**x0.2**	**x0.3**	**x0.4**
Totals(D)				
Addtogethereachofthescoresfor eachbodyregiontogivethefinalPASIScore.				

PASIScore=

The maximum score of PASI is 72. PASI 75 is a 75% reduction of baseline PASI score. It is commonly considered as a denominator for satisfactory results of any treatment modality for psoriasis. [20]

Investigations

All patients included in the study will be subjected to the following laboratory investigations:

1. Complete blood count
2. Liver Function Tests
3. Renal function tests
4. Routine Urine and microscopy
5. Random Blood Sugar
6. Chest X-Ray

7. Serologic tests for hepatitis B, C (In patients with deranged LFT)

8. Human immunodeficiency virus (HIV) testing in patients at risk

9. Skin Biopsy (in selective patients)

Treatment

The patients will be divided into two groups **of 20 each**, A and B. Group A will be treated with oral Methotrexate while Group B will be treated with oral Apremilast and Methotrexate and they would be evaluated every 4 weeks for a period of 12 weeks.

Group A Methotrexate will be given orally as 7.5 mg per week. Tab folic acid 5mg would be given to the patients on all the other days for a period of 12 weeks.

Group B: Methotrexate and tablet Folic acid 5mg as per regimen in group A along with oral Apremilast will be given to the patients in the following doses:

Day 1-4: 10 mg once daily

Day 5-8: 20 mg once daily

Day 9 onwards: 30 mg once daily

Follow-up

Patient will be called for follow-up at 4^{th}, 8^{th} and 12^{th} week respectively. The patient's history and examination will be done and his weight, PASI, investigations (CBC, LFT and RFT) will be done. If required, changes in treatment would be done.

Evaluation

To assess the clinical response to treatment, PASI score will be calculated at baseline, 4, 8 and 12th week. To compare the improvement within each group and among both group, paired t-test and unpaired-t test will be used respectively and p value (level of significance) < 0.05 will be considered significant.

PARTICIPANT/PATIENT INFORMATION SHEET

This is a prospective study which aims to compare the efficacy and safety of Oral Methotrexate versus Oral Methotrexate with Apremilast in patients with Moderate to Severe Chronic Plaque Psoriasis.

Total duration of the study is 2 years, with voluntary participation of 40 patients in total.

To aid the diagnosis made clinically, procedures like skin biopsy, along with some needed investigations like Complete blood count, Liver Function Tests, Serologic tests for hepatitis B, C, Renal function tests, Human immunodeficiency virus (HIV) testing in patients at risk for AIDS, Urine Routine Microscopy, Random Blood Sugar and Chest X-Ray will be done.

Likely risks and discomforts that can occur following any procedure are pain, bleeding and secondary infection, for which adequate measures like local anesthetic agent and NSAIDs for pain, pressure bandage to achieve hemostasis and antibiotic coverage to prevent secondary bacterial infection, will be ensured, wherever necessary.

This study will help spread awareness, improve the understanding, prevent further prodigious, and hence, aid in the management of the disease.

Non-disclosure of the identity of the participants will be made sure of, during the entire study. The biological sample collected and the data related to it, can be used for research purposes in the future, after obtaining the participant's voluntary consent for it.

Contact details of principal investigator - DrDivyanshuSrivastava, Department of Dermatology, Venereology and Leprosy, C.S. Subharti Hospital & Subharti Medical College, Meerut.

Informed Consent form

Study Title: A comparative study of the efficacy and safety of Oral Methotrexate versus Oral Methotrexate with Apremilast in patients with Moderate to Severe Chronic Plaque Psoriasis.

Study Number:

Subject Initials:

Date of Birth/Age:

Subject 's Name:

Address: ----------

(i) I confirm that I have read and understood the information sheet dated, _____ for the above study and have had the opportunity to ask questions. [ ]

(ii) I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected. [ ]

(iii) I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s). [ ]

(iv) I agree to take part in the above study. [ ]

Signature (or Thumb impression) of the Subject/Legally Acceptable Representative _____

Signatory's Name:_____ Date:___/____/____

Signatory of the Investigator:_____

Study Investigator's Name:_____ Date:___/____/____

Signature of the Witness. _____

Name of Witness:_____ Date:___/____/____

Copy of the patient information sheet & dully filled informed consent form shall be handed over to the subject or his/her attendant.

PATIENTS PROFORMA

Subharti Hospital	**Serial Number:**
	Original Date of Consultation:
	OPD/IPD Number:
	Telephone Number:

Name:	**Age/Sex:**
Father Name:	**Marital Status**
Address:	**Occupation**

Presenting Complaints

History of Present Illness
Age of Onset:
Duration of Present Episode:
Progression:

Medical History
Any acute or chronic inflammatory disorder:
History of recent fever, illness, joint pain etc.
Treatment History:

Personal History
Diet:
Smoking Index:
Alcohol consumption (quantity and duration):
Menstrual history:

Family History
Similar complaints:

General Examination:

General Condition:
Pulse Rate:
Blood Pressure:
Body Temperature:
Respiratory Rate:
General Physical Examination (Pallor/ Icterus/ Clubbing/ Cyanosis/ Pedal Edema/ Lymphadenopathy)
Body Mass Index (BMI):

Systemic Examination:

Dermatologic Examination:
Cutaneous Findings **Clinical Type of Psoriasis (Chronic Plaque/ Guttate/ Flexural/ Rupoid/ Pustular/ Erythrodermic)**
Nail
Mucosa
Scalp
Other relevant cutaneous findings

Psoriasis Area and severity Index

Plaquecharacteristic	Lesionscore	Head	UpperLimbs	Trunk	LowerLimbs
Erythema	0=None 1=Slight 2=Moderate 3=Severe 4=Verysevere				
Induration/Thickness					
Scaling					
Addtogethereachofthe3scores foreachbodyregiontogive4 separatesums(A).					
LesionScoreSum(A)					

Percentageare affected	Areascore	Head	UpperLimbs	Trunk	LowerLimbs

AreaScore(B) *Degreeofinvolvementasa percentageforeachbody regionaffected(scoreeach regionwithscorebetween 0-6)*	0=0% 1=1%-9% 2=10%-29% 3=30%-49% 4=50%-69% 5=70%-89% 6=90%-100%				
MultiplyLesionScoreSum(A)byAreaScore(B),for eachbodyregion,togive4individualsubtotals(C).					
Subtotals(C)					
MultiplyeachoftheSubtotals(C)byamountofbodysurfacearearepresented bythatregion,i.e.x0.1for head,x 0.2forupper body,x0.3for trunk, andx0.4for lowerlimbs.					
BodySurfaceArea		x0.1	x0.2	x0.3	x0.4
Totals(D)					
Addtogethereachofthescoresfor eachbodyregiontogivethefinalPASIScore.					

PASIScore= [ ]

Investigations

- Complete blood count (CBC)
- Liver function tests
- Renal function tests
- Routine Urine and microscopy
- RBS
- Chest X-Ray
- Human immunodeficiency virus (HIV) test (if done)
- Serologic tests for hepatitis B, C (if done)

- Histopathology (if done)

Treatment given:

Topical:

Systemic:

Subsequent visits

VISIT	NEW COMPLAINTS	EXAMINATION FINDINGS	PASI	WEIGHT	INVESTIGATIONS (CBC, LFT, RFT)	TREATMENT CHANGES (IF ANY)
2nd Visit (4 weeks)						
3rd Visit (8 weeks)						
4th Visit (12 weeks)						

PERFORMA FOR PROJECT COMPLETION REPORT -835

To,

Date: 10-11-2021.

Head of Department

Name of Department: DERMATOLOGY, VENEREOLOGY AND LEPROSY

Name of College: SUBHARTI MEDICAL COLLEGE

Findings of the project: (Max-100 words) On comparing the monotherapy with Methotrexate and combination therapy of methotrexate and Apremilast, the latter was found to be more efficacious. ② The combination therapy had advantages in terms of better drug tolerability and early break control which can effectively shorten the duration of therapy with Methotrexate. ③ The combination can be helpful in early tapering of Methotrexate that can reduce the possible side-effects of the drug.

External Support: ~~NONE~~ Sakyamuni Buddha National Institute for Rural Development, Management and technology

Name of PI: DIVYANSHU SRIVASTAVA

Name of the Department: DERMATOLOGY, VENEREOLOGY AND LEPROSY

Name of College: SUBHARTI MEDICAL COLLEGE

Title of the Project: A COMPARATIVE STUDY OF THE EFFICACY AND SAFETY OF ORAL METHOTREXATE VERSUS ORAL METHOTREXATE WITH APREMILAST IN PATIENTS WITH MODERATE TO SEVERE CHRONIC PLAQUE PSORIASIS

Duration of the Project: 18 MONTHS 2019-2021

Signature of P.I.

Employee Code

Registrar
Swami Vivekanand
Subharti University
MEERUT

ROLE OF COMPUTER TOMOGRAPHY IN EVALUATION OF FACIAL TRAUMA

Research Proposal Submitted

By

Dr. Sachin Agrawal

DEPARTMENT OF DERMATOLOGY,

VENEREOLOGY AND LEPROSY

Subharti Medical College & Hospital

INTRODUCTION

Computer Tomography scanner was invented by "Sir Godfrey Newbold : unstleld" in!972. Hounsfield first built a prototype head scanner and tested it first ■ preserved human brain, then on fresh cow brain from a butcher shop and later on -self. CT scan was introduced into medical practice with a successful scan on- a .erebral cyst patient at Atkinson Morley's Hospital in Wimbledon London, United Kingdom.[1]

Since the first CT scanner w'as developed in 1972 by Sir Godfrey Hounsfield, ~-r modality has become established as an essential radiological technique applicable : wide range of clinical situations. CT uses X-rays to generate cross-sectional, two- _ -rnsional images of the body. Images are acquired by rapid rotation of the tube around the patient. The transmitted radiation is then measured by a ring of . "-:ive radiation detectors located on gantry around patient. The final image is ,.- .rated from these measurements utilizing the basic principle that the internal o :: jre of the body can be reconstructed from multiple X-ray projections.[2]

Facial trauma, also called maxillofacial trauma, is any physical trauma to the racial trauma can involve soft tissue injuries such as bums, lacerations and —- ses. or fractures of the facial bones such as nasal fractures and fractures of the sr»„ as well as trauma such as eye injuries. Symptoms are specific to the type of ■ . - :Tr example, fractures may involve pain, swelling, loss of function, or changes nr ~-c —ape of facial structures.[3]

ATen fractures are suspected, radiography such as X-ray, CT, USG is used for : - causes of facial trauma include falls, industrial accidents, and sports

7 canning is better for detecting fractures and examining soft tissues, and is •MCT-eecea to determine whether surgerv is necessarvf CT scanning is usually — *n* ; i ;; oe more definitive and better at detecting facial injuries than X-ray.[5]

ALMS AND OBJECTIVES OF THE STUDY

As every function has a certain objectives and without objectives, any function cannot achieve its

aim. the proposed study has also some objectives to direct the study and achieve the aim of the study and make the study meaningful and complete. The main objective of the study is to evaluate the site of fracture in CT Face. The objectives of the proposed study can be mentioned as follows:

1. To evaluate the site of the fracture in CT face.
2. To evaluate the number and type of fracture.

?reda L, La Fianza A, Di Maggio EM, Dore R, Schifmo MR, Mevio K, Campani *et.*COMPLEX MAXILLOFACIAL TRAUMA: DIAGNOSTIC CONTRIBUTION OF MULTI PLANAR AND TRIDIMENSIONAL SPIRAL CT IMAGING OF FACIAL TRAUMA[10]

Adequate radiologic assessments of the maxillofacial trauma patients were done. The greatest advantage of CT facial imaging is the improved depiction of skeletal injuries along a horizontal plane, paralleling that of axial scans. The depiction of fractures of cribriform and of orbital roof and floor was particularly useful from a clinical viewpoint. The spiral technique, with its pitch increases up to 2. permits to limit the radiation dose while preserving the quality of post processing reconstructions. Decreasing the execution time is important in multiple trauma patients who are often clinically unstable or have damaged vital organs.

Jolanta Myga-Porosilo, Stanislaw Skrzelewski, Wojciech Sraga, Hanna Borowiak, Zuzanna Jackowska and Ewa Kluczewska: CT IMAGING OF FACIAL TRAUMA - THE ROLE OF DIFFERENT TYPES OF RECONSTRUCTION-PART II[11]

CT study of the facial cranium was conducted in every case. The obtained data were presented in the transverse presentation (TP). Multiplanar (2D) and volumetric (3D) reconstructions were performed secondarily.

Out of 67 patients, in 25 cases, there wereherniations of soft-tissue elements through fractures to the paranasal sinuses. In 10 patients from this group, there was herniation of fat tissue and oculomotor muscles, while in 15 patients there w as herniation of fat tissue only. Fluid in paranasal sinuses and nasal cavity was observed in 48 cases. The presence of subcutaneous emphysema of soft tissues w as present in 29 patients.

Multiplanar facial CT reconstructions increase the effectiveness of imaging of orbital tissue herniations, especially in case of fractures in the inferior orbital wall.

In suspected soft tissue hernitations, as well as prior to surgical treatment, spiral CT with 2D multiplanar reconstruction should be the method of choice. R\an T. Whiteselil, Scott D. Steen burg Changyu Shen Hongbo Lin: FACIAL FRACTURE IN THE SETTING OF WHOLE-BODY CT FOR TRAUMA: . INCIDENCE AND CLINICAL PREDICTORS [12] ' .

The clinical data from the electronic medical records, including the final radiology reports, of486 consecutive patients who underwent MDCT for trauma face with- . dedicated maxillofacial reconstructions were studied.

Two hundred sixteen patients had fracture on the dedicated maxillofacial CT examinations, 215 of whom had facial physical examination findings. Of the 28 patients without documented physical examination findings, 27 did not have a facial fracture in CT examination. Falls from a height greater than standing height and open- vehicle collisions had the highest fracture rates.

CT is the preferred modality for the evaluation of the facial skeleton and for surgical planning and can be easily integrated into the conventional trauma scanning protocol.

The data suggest that there is clinical value in performing dedicated CT face in the setting of facial trauma.

Elina Peltola: MULTIDETECTOR COMPUTED TOMOGRAPHY OF FACIAL TRAUMA[13]

The study found that there was multiple non-contiguous fractures in most of the cases and few were solitary fractures. Of all the patients sustaining a fracture, some patients had clear sinuses.

MDCT is the cornerstone of modern emergency radiology. It can be used to detect '• and characterize the facial injuries in trauma. Non-displaced fractures as well as 3D morphology can be visualized, improving the detection of complex fractures. MDCT enables high-quality MPR and isotropic viewing.

DCT is a widely used, well-accepted, and straightforward imaging method. After trauma, the restoration of the face involves both accurate clinical and radiological evaluation to effectively plan

the management of these injuries. To achieve an accurate diagnosis, adequate imaging is essential.

MATERIALS AND METHODS

DESIGN:

... ■ : facial trauma by Computer Tomography of face.

TATE OF STUDY:

Pr *5pec • c —>ervational study.

SETTING:

:: Department of Radio-diagnosis and Imaging, Subharti Medical atrapat Shivaji Subharti Hospital, Swami Vivekanand Subharti Lancrsitv. Meerut. U.P.

r*RTCIPANTS:

Tic **scarce** of **data** for this study are the patients referred to the Department of Radio- tewKB and **Imaging** for the CT Face from OPD/IPD and emergency department of **QhMfe^pali** Sfervapi Subharti Hospital. Subharti Medical College, Meerut, U.P.

rOPITATION:

UPIDLIF:

MDjpthpaih Cat 12SSfice MDCT and single slice GE CT machine. Department **rfldb-dapasB and fcaipaf, Chhatrapati Shnaji Sobharti Hospital, Meerut, U.P.**

FNCLESON CRITERIA.

Al Ae patients referred IbrCT FACE with clinically sc—rf.ee facial injuries. EXCLUSION CRITERIA:

1. Pregnancy
2. Patients who refuse to give consent other than unknown RTA
3. Uncooperative patient>**I)S OF COLLECTING DATA:**

• -r. protection and 10 day rules will be strictly followed.

- -•taining clinical history, relevant clinical examination will be done. ,

informed consent for confirmation of diagnosis, the patient will be safpected to imaging modality.,

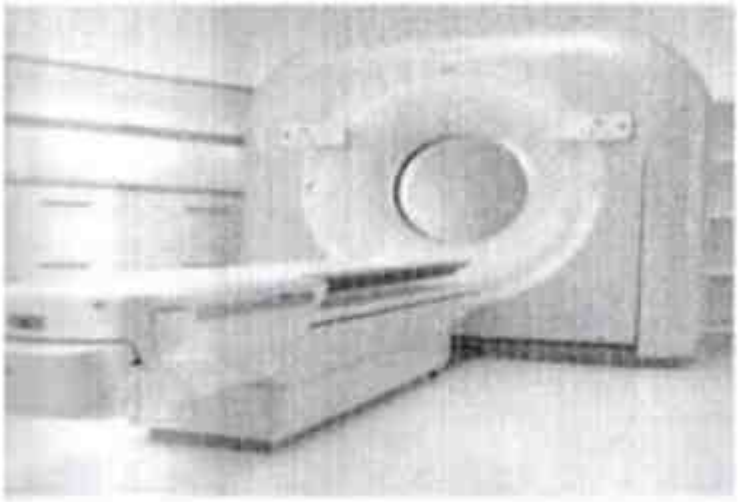
nation will be done on Philips Ingenuity Core 128 slice MDCT.

. , - _ and diagnosis of facial trauma will be made as per departmental

H i KI v E SPECIFICATION:

Table: 1 - Machine specification

[illegible]	**Philips**
[illegible]	MDCT Philips Ingenuity Core 128 slice CT
[illegible]	**120**
[illegible] of Detector Coverage	**40 cm**
[illegible]	**0.625mm**
[illegible]	EBW: V4.5.4.50015, Windows XP x64 version



f:. lips Ingenuity Core 128 Slices MDCT

>TOCOL AND TECHNIQUE:

PARAMETERS

ftosoa:	Supine
OBT	Level of chin
lie* rtpe	Helical
Sarv-gram	Anterior-Posterior/Lateral
_-nt orientation	Head First
entra! line of laser	Along the Mid-sagittal plane at chin
'-.natomical landmarks	Mid-axillary line. Mid-sagittal line
Field of view	Upper end of frontal bone to lower end of mandible
Mode of sequence	During breathing or without breathing
Scan orientation	Caudo-cranial
Gantry tilt	0 degree
Slice thickness	5 mm
Pitch	1
Reconstruction slice thickness	1 mm and 3 mm
KVp	120
MAs	220
Matrix	512x512
Window setting	Bone/Soft tissue
Window Width	1000-2000HU/300-350 HU
	150-350HU/50-100HU
Scan time	4-6 Sec.
Shape of measurement	Linear
Unit of measurement	mm

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 11/11/2021

Head of Department

Name of Department: Radio - Diagnosis

Name of College: Subharti Medical College

Findings of the project: (Max-100 words):

As far as fracture imaging is concerned, the 2D image reconstruction and volume rendering proved to be the most effective in majority of locations 3D image reconstruction proved the most sensitive in most cases of loose displaced bone fragments, except for fine structures such as ethmoid bone & inf. orbital wall

External Support: Vikramshila Shodh Sansthan

Name of PI: Dr. Sachin Agnihotri

Name of the Department: Radio Diagnosis

Name of College: Subharti Medical College

Title of the Project: Role of CT in Evaluation of Facial trauma

Duration of the Project: 2019-20

Registrar
Swami Vivekanand
Subharti University
MEERUT

INTRODUCTION

At the end of 2019, humankind was faced with an epidemic—severe acute respiratory syndrome coronavirus 2 (SARS CoV-2)–related pneumonia, referred to as coronavirus disease 2019 (COVID-19)—that people did not expect to encounter in the current era of technology. While the COVID-19 outbreak started in Wuhan, China, the significant spread of the epidemic around the world has meant that the amount of equipment available to doctors fighting the disease is insufficient. There have been more than 27,000,000 confirmed cases and more than 875,000 confirmed deaths worldwide. [1]

The clinical spectrum of the disease ranges from being asymptomatic to full blown acute respiratory distress syndrome (ARDS) [2]. Since its first observation, SARS-CoV- 2 infection outbreak has transformed into an unprecedented worldwide healthcare emergency, which recently reached the necessary epidemiological criteria to be declared pandemic by the World Health Organization.The most common symptoms as per the World health organization are as follows: Fever, sore throat, dry cough, tiredness, aches and pains,diarrhoea, conjunctivitis, headache, loss of taste or smell,a rash on skin or discoloration of fingers or toes.Serious symptoms:difficulty breathing or shortness of breath,chest pain or pressure,loss of speech or movement.[3]

Viral serological test is an efficient investigative means to determine the prevalence for SARS-CoV-2 infection among the population.[4] COVID-19 infection stimulates IgG antibodies against N protein that can be noticed in serum as early as day 4 after the onset of disease, and in most patients seroconversion take place by day 14.[5] Combined examination of the IgM-IgG proved better efficacy and sensitivity compared to a single antibody.[6]

The assenting diagnosis of COVID-19 is dependent on the viral isolation by polymerase chain reaction (PCR) from sputum, or nasal swab, or throat swab for the categories of those with symptoms or potentially exposed.[7] The real-time-reverse transcription (RT)-PCR detection of viral nucleic acid test (NAT) is considered as sensitive, specific and able to process large batches of samples.[8]The RT-PCR results generally become positive after 2–8 days. [9] However, the commonly used RT-PCR method shows false-negative in some cases, such as mutations of the SARS-CoV-2 genome, variable viral load kinetics or laboratory errors. [10] It may lack sensitivity, particularly in the advanced phase of infection, and depends closely on the samples' quality. [11] As turnaround time of RT-PCR is long, molecular point of care tests (POCT) should be considered in situations where quick results are critical.[8]

This rapid PCR by cartridge system (CBNAAT: cartridge-based nucleic acid amplification test or GeneXpert polymerase chain reaction test) reduces response times [11], demonstrated equal performance compared to routine in-house RT-PCRs [8], but is not suitable for laboratories with high throughput of requests. [11]

In COVID-19, chest X-ray (CXR) shows patchy or diffuse reticular-nodular opacities and consolidation, with basal, peripheral and bilateral predominance.[12]The consideration of CXR

for early detection may contribute an important role in the regions around the world with limited access to RT-PCR COVID testing. [13]

Computed tomography (CT) can be considered as an essential supplemental investigative tool for the detection of COVID-19 pneumonia in this pandemic context. In severe cases, CT plays an important role in identifying viral lung infection, examining the nature and extent of pulmonary lesions, and scrutinizing the disease severity.[14] Known features of COVID-19 on initial CT consist of bilateral multilobar with an usual of three lung segments, ground-glass opacification (GGO) with a peripheral or posterior distribution, principally in the lower lobes and some times inside the right middle lobe. Consolidative opacities superimposed on GGO may be reported in a few elderly population. Other uncommon findings include septal thickening, bronchiectasis, pleural thickening, and subpleural involvement, which are rarely reported in the later stages of the disease.[15] The imaging pattern readily change over a short period of time.[16]

It plays an irreplaceable role in the screening of suspected patients, the diagnosis and differential diagnosis of diseases, clinical classification, assessment of disease progression, detection of pulmonary complications, and follow-up after discharge.[17] Chest X-ray is limited in its ability to detect the presence and extent of lung involvement with COVID-19 infection.[18] In contrast, high-resolution chest computed tomography (HRCT) has been reported to provide immediate results with a high sensitivity and specificity for detecting COVID-19 infection and the extent of lung involvement.[17,18,19]

Infection due to SARS-CoV-2 causes an activation of the host immune response leading to rise in inflammatory mediators.[20] Inflammatory responses triggered by rapid viral replication of SARS-CoV-2 and cellular destruction can recruit macrophages and monocytes and induce the release of cytokines and chemokines.[21] Inflammatory markers such as procalcitonin (PCT), serum ferritin, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) and interleukin-6 (IL-6) have been reported to be significantly associated with the high risks of the development of severe COVID-19. [22]

Acute inflammation in the lungs is a complex pathophysiological mechanism involving inflammatory mediators such as cytokines and chemokines, which stimulate the macrophages in the alveoli, leading to poor regulation of the immune system.[23] In humans, the clinical progression of the novel coronavirus-induced disease exists in a triphasic form.[24] The clinical features in first phase include fever, dry cough, myalgia, and other systemic infections that are likely to be increased by the replication of the virus and cell necrosis. The associated feature of the second phase is the onset of IgG immunoglobulins conversion, correlated with the decrease in viral replication. During this phase, uncontrolled viral replication occurs causing severe worsening of symptoms. The exact hypothesis behind this might be the severe damage to alveoli caused by over exuberant immune response of the host.[24,25] A decreased lymphocyte count and an increased high-sensitivity C-reactive protein (hs-CRP) level are the most common laboratory findings.[26] As the infection advances, white blood cell count (WBC), neutrophil count, platelet count, red blood cell distribution width-coefficient of

variation (RDW-CV), and RDW-standard deviation (RDW-SD) parameters elevates with severity of the diseases; while, lymphocyte count, eosinophil count, red blood cell count (RBC), hemoglobin, and hematocrit parameters decreases. The combined neutrophil-to-lymphocyte ratio and RDW-SD parameter is the best hematology index.[27]

In nCOVID-19-infected patients, the major patient population recovered after two weeks, but one-third of the patients progressed to the third phase, which is characterized by severe lung inflammation leading to ARDS, i.e. acute respiratory distress syndrome. [28]

In absence of specific therapeutic drugs or vaccines for 2019 novel coronavirus disease (COVID-19), it becomes necessary to detect the disease at an early stage, and immediately so as to isolate the infected person from the healthy population from COVID-19 cohorts and autopsies highlight significant diffuse inflammation and widespread tissue damage, such as renal, cardiac and muscular damage, in addition to pulmonary impairment. [29]

AIMS AND OBJECTIVES

i. To study the different patterns of HRCT chest findings seen in covid patients.

ii. To evaluate whether CT findings and severity scoring maybe predictive of patient's outcome.

iii. To evaluate whether inflammatory markers indicate the severity of the disease.

MATERIALS AND METHODS

SETTING:

Department of Radio diagnosis, Imaging &Interventional radiology N.S.C.B Subharti Medical College, CSS Hospital, Meerut.

TYPE OF STUDY:

Prospective observational study.

SAMPLE SIZE:

The study will be conducted on minimum of 150 patients.

DURATION OF STUDY:

The source of data for this study are patients referred to Department of Radio diagnosis, Imaging and interventional radiology from OPD/IPD of C.S.S. Hospital, under the ageis of N.S.C.B Subharti Medical College,Meerut for a period from October2020 to August 2022.

INCLUSION CRITERIA

- All COVID- 19 positive patients with or without chest symptoms.

EXCLUSION CRITERIA

- Patients with negative RTPCR.
- Other influenza like illness.
- Patients who have not given consent.
- Pregnant patients.
- Paediatric patients.

METHODOLOGY:

- Taking informed consent from the patient.
- After obtaining clinical history(ANNEXURES).
- HRCT examinations will be done on Phillips Ingenuity 128 Slice (MDCT).
- Imaging and Diagnosis of COVID chest findings will be made as per departmental protocols.

CT EXAMINATION

- HRCT of the patients with confirmed COVID.
- CT will be performed using Phillips Ingenuity 128 Slice (MDCT)

POSITIONING

- Supine: Inspiration and expiration, feet down with arms above head
- Prone: Inspiration, feet down with arms above head .

PROTOCOL OF CT IMAGING

Patients included in the study shall be subjected to routine HRCT of Abdomen by:

- **slice thickness:** 0.625-1.25 mm
- **scan time:** 0.5-1 second
- **kV:** 120
- **mAs:** 100-200
- **collimation:** 1.5-3 mm
- **matrix size:** 768 x 768 or the largest available
- **FOV:** 35 cm
- **reconstruction algorithm:** high spatial frequency
- **window:** lung window
- **patient position:** supine (routinely) or prone (if suspected ILD)
- **level of inspiration:** full inspiration (routinely recommended expiratory HRCT scans in patients with obstructive lung diseases

COVID- 19 Diagnosis

COVID- 19 will be diagnosed based on the World Health Organization interim guidance. The patient information regarding demographic data, medical history, clinical manifestation, general physical examination, laboratory findings, chest radiograph (CXR) findings, high- resolution computed tomography (HRCT) scans of the chest, treatment, and outcome data will be extracted from the medical records for data analysis. For clinical correlation, the study participants will be segregated into four categories based on the level of disease severity, viz. asymptomatic, mildly ill, severely ill and critically ill as per the Indian Council of Medical Research (ICMR) guidelines. The mild illness group constituted COVID- 19- positive patients with symptoms of upper respiratory tract infection including fever, cough, sore throat, headache, shortness of breath, myalgia, joint pain, etc. without evidence of viral pneumonia or hypoxia. The severely ill category has COVID- 19- positive patients with clinical signs of pneumonia (fever, cough, shortness of breath, fast breathing) with respiratory distress and SpO2 >90% on room air. The critically ill category has COVID- 19- positive patients with clinical signs of severe pneumonia and radiological evidence of bilateral opacities in the chest with respiratory failure and COVID- 19- related complication such as ARDS, sepsis, and septic shock after exclusion of other causes.

CT severity score

CT images will be reviewed and scored independently by two respiratory and critical care physicians who will be blinded to the clinical information in a consistent manner. CT severity score will be evaluated based on the criteria as previously described[22]. Briefly, each of the five lung lobes will be assessed for percentage of the area involved. It will be defined as none (0%), minimal (1–25%), mild (26–50%), moderate (51–75%), or severe (76–100%), with corresponded lobe score of 0, 1, 2, 3, 4, respectively. A CT severity score will be calculated by summing the five lobe scores. The total score ranges from 0 to 20.

Cytokine measurement

Blood samples will be collected from the patients on admission or the second day after admission. Serum cytokines including IL-1β, IL-2R, IL-6, IL-8, IL-10, and TNF- α were measured using chemiluminescent immunoassay (CLIA) by Siemens Immulite 1000 analyzer according to the manufacturer's instructions.

Data concerning specific pharmacological treatment against IL- 6, such as tocilizumab therapy and supportive measures such as intensive care unit (ICU) care and noninvasive ventilation (NIV) will be also collected. Mortality will be recorded too.

STATISTICAL ANALYSIS:

• Data will be entered in MS excel and will be analysed using Statistical Package for Social Sciences (SPSS) version 21.0

• Quantitative data will be expressed in mean, standard deviation and difference between two comparable groups will be tested by Unpaired t test or Man Whitney U test.

• Qualitative data will be expressed in percentage. Statistical differences between the proportions will tested by Chi square test or Fisher's exact test.

• Sensitivity, specificity, positive predictive value, negative predictive value of CT will be calculated.

• 'P' value less than 0.05 will be considered statistically significant.

ANNEXURE A

PROFORMA:

PARTICULARS OF THE PATIENT

Case no:

Name: IP number:

Age / sex: Hospital number:

Occupation: Date of admission:

Place: Date of discharge:

Presenting Complaint

fever:
sore throat:
malaise:
anosmia:
loss of taste:
diarrhea:

Past history

Similar complaints in the past:

Diabetes:
Hypertension:
Bronchial Asthma/TB:

Personal history

Diet - Appetite - Sleep -

Addiction - Beedi/Cigarettes/Tobacco/Alcohol.

Findings:

Study Quality

- Adequate
- Motion artifact
- Incomplete

Endotracheal tube

- None
- Appropiate position
- Inappropiate position

Ground glass opacity (GGO)

- Present
- Absent

Laterality of ground glass opacity (GGO)

- Right
- Left
- Bilateral

Location of ground glass opacity (GGO)

- Peripheral
- Central
- Diffuse

Predominant distribution of ground glass opacity (GGO)

Right Left

- Upper
- Middle
- Lower

Quantity of ground glass opacity (GGO)

- Single
- Multiple

Pattern of ground glass opacity (GGO)

- Mosaic attenuation
- Crazy paving
- With consolidation
- Reverse halo/atoll sign

Morphology of ground glass opacity (GGO)

- Rounded
- Not rounded

Centrilobular nodules/Tree-in-bud sign

- Present
- Absent

Solid nodules

- Present
- Absent

Air space consolidation

- Present
- Absent

Lymphadenopathy
Presence of lymphadenopathy

- Present
- Absent

Location of lymphadenopathy

- Hilar
- Mediastinal
- Other

Plueral effusion size

- None
- Small
- Medium
- Large

Presence of mucoid impaction

- Present
- Absent

Presence of bronchial wall thickening

- Present
- Absent

Smooth interlobular septal thickening severity

- None
- Mild
- Moderate
- Severe

Presence of pulmonary cavities

- Present
- Absent

Investigations

- Serum ferritin
- CRP
- ESR
- IL-16
- TNF-α

Impression (based on CT findings):

Treatment and follow up:

ANNEXURE B

PATIENT INFORMATION SHEET

You are entering into a study on"**evaluation of disease patterns and severity by hrct chest in covid-19 patients and its correlation with clinical severity and inflammatory biomarkers''**

Participation in this study is completely voluntary and you can withdraw at any point of time. The refusal to participate will not draw any penalty or loss of benefits to which you are entitled otherwise. The study will be confidential.

The ill effects of CThave been reported to the patient.

I acknowledge that I understand the consent form and my participation is voluntary and give my consent for the study and I also give consent for usage of my study data for research purpose

Date Signature(patient's)

Date Signature (researcher's)

Name of the doctor: Sachi Ojha
PG 2020 Batch
Mobile no9161333133
Radiodiagnosis

PERFORMA FOR PROJECT COMPLETION REPORT

To,
Head of Department
Name of Department: Department of Radio-Diagnosis & Imaging.
Name of College: Subharti Medical College

Date: 18.9.2021

Findings of the project: (Max-100 words): The posterior segment of upper lobe, superior segment of lower lobe, lateral basal segment & posterior basal segment of lower lobe were most frequently involved sites in COVID-19. Lung opacification mainly involved in the lower lobes, in comparison with middle upper lobes. Non survivor groups had lower levels for CRP and serum ferritin compared to survivors. Survivors had low levels of IL-6 than non-survivors

External Support: Nuktatar.

Name of PI: Dr. Mukta Lutal
Name of the Department: Department of Radio-Diagnosis & Imaging.
Name of College: Subharti Medical College
Title of the Project: Evaluation of Disease Patterns & Severity by HRCT Chest in COVID-19 Patients & its correlation with Clinical Severity & Biomarkers
Duration of the Project: 2020-21

Registrar
Swami Vivekanand
Subharti University
MEERUT

"TO STUDY THE OCCURRENCE OF MDR - TB IN CASES OF GENITAL TUBERCULOSIS IN FEMALES OF FERTILE AGE GROUP THROUGH NAAT ON MENSTRUAL BLOOD"

Research Proposal Submitted

By

Dr. Eema Chaudhary

Department of Respiratory Medicine

INTRODUCTION

Although pulmonary tuberculosis is the primary and the most common presentation of tuberculosis in India, there are significant number of cases of extra-pulmonary TB reported. Genital tract is no exception to this. Female genital tract tuberculosis not only poses a diagnostic challenge but may lead to infertility and change in genital functions, which is a " source of great disturbance in patients. Infertility is taken as curse in this country. Fallopian- • tubes being affected most commonly (90 %), followed by the endometrium (50 %) and the ovaries (10-30 %). It is almost always secondary to a tubercular lesion elsewhere in the body. Apart from infertility other clinical presentations include oligomenorrhoea, amenorrhoea. menorrhagia, abdominal pain, dyspareunia, and dysmenorrhea. The tubercle bacilli reach the genital tract mainly by haematogenous spread from foci outside the genitalia. Conventional methods for the diagnosis of TB include microscopy and culture. (ISSN: 1756-2228) 2008: DOI 10.3843/GLOWM.10034)[7]

Various nucleic acid amplification tests like TB PCR/RIF RESISTANCE and Cartridge Based Nucleic Acid Amplification Test (CBNAAT)(GenXpert) represents a major advance in the diagnosis of TB. With the use of amplification systems, nucleic acid sequences unique to MTB can be detected directly in clinical specimens, offering better accuracy than microscopy and greater speed than culture. Hystero-salpingography. laparoscopy-dye test, endometrial curettage and laparoscopy with multiple sampling for smear microscopy and culture for Mycobacterium Tuberculosis can detect the cases. Due to the paucibacillary nature of genital tuberculosis, diagnosis by mycobacterial culture and histopathological examination (HPE) has limitations and low detection rate. The involvement - of female genital tract along with resistance pattern has, however, attracted scant attention.This study has been planned with the objective of detection of this resistance partern for better outcomes.

AIMS AND OBJECTIVES

1. To study the occurrence of MDR TB in females of fertile age group suffering from genital tuberculosis using newer diagnostic methods like NAAT on menstrual blood sample.
2. To study the clinical presentations of genital tuberculosis in such patients

MATERIAL AND METHODS

Setting: Females patients of fertile age group having symptoms of genital tuberculosis coming in IPD & OPD of department of Respiratory medicine and gynecology and obstetrics subharti medical college, meerut.

Type of study: Prospective, Cross sectional and observational study.

Sample Size: A minimal of 50 cases of genital tuberculosis will be included in study Duration:

September 2018 - August 2020

Data will be entered in excel sheets, master chart prepared and multivariate statistical analysis will be performed using Chi Square test via SPSS 25.0 software.

A complete clinical histoiy and examination, including genital examination as per standard practice would be done in these patients. They would also be subjected to routine investigations such as sputum for AFB as per RNTCP protocol, complete blood count, Serum glutamic-pyruvic transaminase (SGPT)/(ALT), Alkaline phosphatase, serum bilirubin, Fasting and 2 hours after oral glucose test and chest X-ray PA view. Urine pregnancy test would be also be done. Other radiological views and investigations if required would be done. An ultrasound examination of abdomen would be done. If required a Trans-vaginal ultrasound (TVS) examination of the genital system would be done. In females of childbearing age group along with amenorrhea, after ruling out pregnancy using urine pregnancy test, an endometrial biopsy would be taken.

Dayl or Day2 Menstrual Blood of all females of child bearing age would be taken. The specimen would be subjected to NAAT like CBNAAT (Cartridge Based Nucleic Acid Amplification Test), histological/ cytology and if possible for culture for mycobacteria.

WORKING PROFORMA

Patients's Name:

Age / Sex:

Registeration No. OPD/IPD:

Father/Husband name:

Mobile number/phone number:

Address:

Occupation:

Chief Complaints:

Present History:

Past History:

Diabetes Hypertension

Tuberculosis exposure Chronic

kidney disease Acid peptic disease

Coronary artery disease Personal

History:

Special investigations :

Urine pregnancy test Abdominal

ultrasound Transvaginal ultrasound

Endometrial biopsy Day 1 and Day 2

Menstrual blood

Nucleic acid amplification tests (TB PCR/RIF RESISTANCE AND CBNAAT): True Nat is state of art, innovative molecular technique. Based on real time PCR, this chip based amplification system has made the diagnosis of MDR TB very simple, easy to do and rapid diagnosis possible.

Having the principle of Real time PCR, this technique, can detect TB and Rifampicin resistance from both pulmonary and extrapulmonary samples, having steps of:

DNA EXTRACTION AMPLIFICATION & DETECTION QUANTIFICATION

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 19/01/2021

Head of Department Dr. Eeena Chaudhary.

Name of Department: TB & Respiratory Diseases.

Name of College: Subharti Medical College

Findings of the project: (Max-100 words): Prospective study. included 50 cases.
All patients suspected of Genital TB to were subjected to Menstrual AFB stain & TrueNAAT MTB DNA was detected in only 1 out of 50 patients 7 out of 50 patients were Menstrual AFB stain positive but were found to be Rifampicin Sensitive

External Support: ~~NIL~~.
Buddhist Education Mission

Name of PI: Dr. Pallavi Bajpai

Name of the Department: TB & Respiratory Diseases

Name of College: Subharti Medical College

Title of the Project: To study incidence of MDR-TB in Genital TB. Using Nucleic Acid Amplification Test.

Duration of the Project: 02 years.

Eeena

Employee Code

Signature of P.I.

Registrar
Swami Vivekanand
Subharti University
MEERUT

TO STUDY THE DRUG RESISTANCE PATTERN IN CASES OF DIABETES WITH PULMONARY TUBERCULOSIS IN WESTERN UP

Research Proposal Submitted to

Swami Vivekanand Subharti University,

Meerut (U.P.)

By

Dr. Tamishi Sharma and Dr. Eema Chaudhary

Department of Tuberculosis & Respiratory diseases

INTRODUCTION

DIABETES AND MDR-TB

The emergence of MDR-TB (multidrug resistant tuberculosis), caused by *M. tuberculosis* (MTB) that is resistant to at least Isoniazid and Rifampicin, is posing a great threat to global public health. Despite effective preventive and therapeutic methods that have been actively promoted worldwide, it is still estimated that 3.3% of newly diagnosed tuberculosis (TB) cases and 20% of previously treated TB cases have MDR-TB according to WHO reports[1]. The treatment of patients infected with MDR-TB strains is extremely challenging due to the complexity of chemotherapy regimens and the toxicity of alternative drugs. Furthermore, treatment of MDR-TB imposes a huge financial burden on public health systems. However, compared with the cure rate of 96% in drug-susceptible TB, the cure rate of MDR-TB reaches only 54%, making it known as a fatal disease[2]. Accordingly, identifying the risk factors associated with MDR-TB is of great significance, which may assist in the guidance of intervention measures, promote development of follow-up strategies in specific susceptible populations, and help decision-making in terms of resource allocation.[3]

Several risk factors have been identified for MDR-TB. Among them, previous treatment ranks the strongest and most frequent determinant of MDR-TB, which may be related to the selective pressure of suboptimal regimens or treatment interruptions[4]. Other factors include younger age, human immunodeficiency virus (HIV) infection, smoking or other substance abuse, being a health care worker and so on. However, as the association

between most risk factors and MDR-TB differed in different regions and study designs varied, further insight into this area is required[5].

Recently, along with the convergence of the diabetes mellitus (DM) and TB epidemics, the high prevalence of DM among MDR-TB patients is a serious cause for concern, with a range of 10–23% of MDR-TB patients having DM[6]. Whether DM, usually accompanied with altered immunity, has an effect on MDR-TB transmission, as similar with other immunodeficiency related disease (e.g. HIV), is yet to be determined[7]. Findings from studies exploring the associations between DM and MDR-TB have been discordant and some studies did not consider potential confounding factors[8].

Increase in the burden of non-communicable diseases and aging populations are changing the importance of different risk factors for TB. Although classic risk factors and co-morbidities such as overcrowding, under-nutrition, silicosis and HIV infection are crucial to address, chronic conditions like diabetes are important factors that impair host defenses against TB[9]. The association of Diabetes and TB was confirmed by Root since 1934. So far, many types of research and reviews have confirmed this finding and suggest that the overall risk of TB in persons with DM is two to three times higher than in the general population DM in this association may still contribute substantially to the burden of TB and negatively affect the treatment outcome. Chronic hyperglycemia alters the treatment outcome and prognosis of TB to a great extent[10].

CAUSES OF DRUG-RESISTANT TUBERCULOSIS

Drug-resistant TB, like TB is a disease of Poverty, expressed through microbial, clinical and programmatic channels. From a microbiological perspective, the resistance is caused by genetic mutation that makes a drug ineffective against the mutant bacilli. In clinical settings, as inadequate or poorly administered treatment regimen allows drug-resistant

mutants to become the dominant strain in a patient infected with TB. Clinical characteristics of patients have also been recognised where appropriately administered drugs have not achieved necessary drug levels to deal with all populations of mycobacteria. From a programmatic perspective, weak TB services lead to delay in detection and effective treatment of drug resistance and are unequipped to support patients to keep adherence to treatment and prevent ongoing transmission[11].

PREVENTION OF DRUG RESISTANCE

The problem of DR-TB cannot be addressed completely by standalone systems for detection and treatment of drug resistance. Strong systems to detect, successfully treat and ensure long-term disease-free status of TB patients, are required to prevent emergence of resistance. Thus, basic TB diagnostic and treatment services should receive priority and systems for early detection and treatment of drug-resistance forms of TB which should be integrated into existing TB services. Improperly treated patients with resistant strains of TB will constitute a source of ongoing transmission of resistant strains. The interruption of transmission and not only rapid detection and immediate enrolment on effective regimens are therefore necessary to prevent the emergence of new DR-TB patients. Measures to prevent incidence and transmission of TB are also effective in prevention of drug-resistance[12].

AIMS AND OBJECTIVES

To study the drug resistance pattern in cases of diabetes with pulmonary tuberculosis in western UP.

MATERIALS AND METHODS

- **INCLUSION CRITERIA**

(1) Exploring the association between DM and MDR-TB (diagnosed by CBNAAT) with consideration of potential confounding factors.
(2) Patients who are Sputum positive and CBNAAT resistant to rifampicin.
(3) To evaluate the resistance pattern in MDR-TB.

- **EXCLUSION CRITERIA**

(1) Critically ill patients.

WORKING PROFORMA

NAME-

AGE/SEX-

DOA/OPD VISIT DATE-

IHD/IPD NO.-

TB DIAGNOSED SINCE-

DIABETES MELLITUS DIAGNOSED SINCE-

CURRENT DRUGS-

RECENT/LAST BLOOD SUGAR LEVEL-

HbA_1C-

SPUTUM STATUS-

CB-NAAT STATUS-

HISTORY OF TB IN PAST-

SITE OF TB-

REMARKS-

DRUG SUSCEPTIBILITY TEST (DST)-

Rifampicin	
Isoniazid (inhA/0.1)	
Isoniazid (katG/0.4)	
Streptomycin	
Ethambutol	
Pyrazinamide	
Kanamycin	
Capreomycin	
Amikacin	
Levofloxacin	
Moxifloxacin (0.5)	
Moxifloxacin (2)	
Fluoroquinolones Class	
Second-line injectable Class	
Second-line injectables (eis)	
Ethionamide	
p-aminosalicylic acid	
Linezolid	
Clofazimine	
Clarithromycin	
Azithromycin	
Bedaquiline	
Delamanid	

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 20/06/2021

Head of Department Dr. Eema Chaudhary.

Name of Department: TB & Respiratory Diseases.

Name of College: Subharti Medical college.

Findings of the project: (Max-100 words): 72 patients presenting with Diabetes and Multi Drug resistant TB were studied. Male to Female ratio was 72:28. Maximum subjects belonged to age group 41-50 yrs. Mean RBS was 310.17 ± 110.56 and mean HbA1c was 9.01 ± 1.52 MDR-TB was reported among 47.62% of subjects with HbA1c of 7-9 and among 2.38% subjects with HbA1c >9. Pre XDR was among 53.3% subjects with HbA1c 7-9 & 6.67% in subjects with HbA1c >9

External Support: LiH's Laboratories

Most patients were resistant to Rifampicin 69.05%, Flouroquinolone resistance was found in 11.9% and SLID resistance was in 4.76%. Every patient on ATT should be screened for DM. and control of sugar is very important.

Name of PI: Dr. Tanishi Sharma

Name of the Department: TB & Respiratory Diseases.

Name of College: SMC.

Title of the Project: TO STUDY THE DRUG RESISTANCE PATTERN IN CASES OF DIABETES WITH PULMONARY TB IN ~~2nd~~ WESTERN UP.

Duration of the Project: 02 YEARS

Eema

Employee Code

Signature of P.I.

Registrar
Swami Vivekanand
Subharti University
MEERUT

COLPOSCOPIC EVALUATION IN CASES OF PERSISTANT INFLAMMATORY PAP SMEAR

Research Proposal Submitted

By

Dr. Paridhi Chaudhary

Department of Dermatology,

Subharti Medical College & Hospital

INTRODUCTION

COLPOSCOPIC EVALUATION IN CASES OF PERSISTANT INFLAMMATORY PAP SMEAR

Cervical cancer is a public health problem in developing countries like India. In India, Cervical cancer is the second most common cancer among women and accounts for 20% of all malignant tumors in females. India has a population of 436.76 million women aged 15 years and older who are at risk of developing cervical cancer, out of which over 1,20,000 women are diagnosed with cervical cancer and over 65,000 dies from it every year. Despite the fact that Cervical cancer is a largely preventable disease if diagnosed in the early stages, in India only 5% are reported in the early stages. [1,6]

Cervical cancer is the fifth most common cancer in the world, it is the main cancer among women in sub-Saharan Africa, India, and other parts of the developing world. Evaluation of screening performance of effective, feasible and affordable early detection and management methods is a public health priority.[2]

An HPV infection is caused by the *human papillomavirus*, a DNA virus from the papillomavirus family. Over 170 types have been described. More than 40 types may be spread through sexual contact and infect the anus and genitals. Risk factors for persistent infection by sexually transmitted types include early age of first sexual intercourse, multiple sexual partners, smoking, and poor immune function.HPV is the most common sexually transmitted infection globally. Worldwide in 2018, an estimated 569,000 new cases of cervical cancer occurred, with 311,000 deaths. Around 85% of these cervical cancers occurred in low- and middle-income countries. [WHO]

Diagnosis of HPV starts with clinical suspicion and certain diagnosis can be attained by histological, cytological examinations and molecular methods looking for HPV DNA. At present, there are various molecular methods for detecting HPV DNA. The expectation from

these methods is to detect high-grade lesions and the risk of developing high-grade lesions and also to detect women with low risk. [8]

The HPV has emerged over the past decade as the leading candidate to be the sexually transmitted etiological factor in cervical cancer.[5]

. However, most HPV infections become undetectable by even sensitive HPV DNA testing within 1 to 2 years. The prevalence of infection peaks at young ages and declines thereafter, perhaps as the result of HPV type-specific acquired immunity[5]. Most HPV infections are neither microscopically evident nor visible, making HPV DNA detection the diagnostic reference standard. Poorly defined immunologic factors are the major determinants of viral outcome. Smoking, multiparity, and long-term oral contraceptive use increase the risk of persistence and progression. Other sexually transmitted infections (eg, *Chlamydia trachomatis*), chronic inflammation, and nutritional factors might also play a role.

Early cervical epithelial changes can be identified by a Pap smear test, which is the primary screening test for the detection of precancerous cervical intraepithelial neoplasia and the early stage of invasive cervical cancer. [9]These changes can then be confirmed by Cytology and Colposcopy methods as precancerous lesions.

As per screening guidelines, colposcopy is done only on detection of atypical cells on cytology. It is important to assess whether persistant inflammatory changes on pap smear could be the first indication of premalignant changes in the cervix and whether further evaluation by colposcopy would help to triage these women.

In the study ,women attending the gynecology OPD will be screened with a pap smear , those with inflammatory PAP smear will be treated with antibiotics according to WHO guidelines and a repeat pap smear will be taken. Women with persistent inflammatory smear will be subjected to colposcopy and directed biopsy if required.

AIMS AND OBJECTIVES

1. To study colposcopic features in the cervix of persistant inflammatory cellular changes on pap smear.

2. To study HPV DNA in cervix of persistant inflammatory cellular changes on Pap smear.

3. To study epithelial cell abnormalities by taking colposcopic directed multiple biosy of abnormal areas in such cases.

4. To determine the incidence of cervical intraepithelial neoplasia or invasive carcinoma in patients with persistant inflammatory pap smear.

MATERIAL AND METHODOLOGY

Study design:

This is a prospective analytical study will be conducted amongst woman attending the out patient department of OBG at Subharti Medical College

Sample Size:

Total 100 cases

Duration of study:

2 years

INCLUSION CRITERIA- All females sexually active females in reproductive age group (21 to 60 yrs) attending the obstetrics and gynecology out-patient-department of Chattrapati Shivaji Subharti Hospital, Meerut, over a period of two years.

EXCLUSION CRITERIA-

1. Women less than 21 years of age.

2. Women more than 60 years of age.

3. Patients with previous surgeries on cervix.

4. Hysterectomised women.

5. Women with obvious growth on cervix.

6. Women already being treated for cervical cancer.

7. Patients with pap reports other then persistant inflammatory reports.

8. Pregnant ladies.

METHODOLOGY

A detailed history about various general and clinical aspects will be taken from the patients attending the OPD of OBG at Subharti Medical College and who are willing to take part in the study.

Detailed menstrual history and obstetric history including married life, parity number of abortions ,age of coitarche, Number. of partners, History of any STD, etc will be asked from the patients to rule out any exclusion criteria of the study.

All women who fulfill the above criteria will be enquired in detail about personal history.

A general physical examination would be done and then these women would be subjected to conventional PAP test, Individual data will be recorded on a pre-structured Proforma for future analysis.

Patients with a report of inflammatory Pap smear will be selected at random for initial recruitment. These patients will be advised to take complete treatment of pelvic inflammatory disease. A repeat Pap smear was performed after a period of 3 months with Ayer's wooden spatula. No preparation of the cervix will be undertaken at the time of sampling and women should not be menstruating or using any vaginal douche or vaginal contraceptives at the time of sampling. If inflammatory cellular changes are reported again on the repeat Pap smear, these patients will be subjected to HPV DNA testing and colposcopic examination and multiple biopsies will be taken from abnormal areas after taking written informed consent from the patient.

METHODS

1) **PAP SMEAR-** We will perform pap smear by introducing the bivalve cusco speculum without lubricants,cervix will be exposed and will be studied in good light, the squamo columnar junction will be scraped with an ayre's spatula and anendo cervical brush,will be smeared on glass ,will be immediately dipped in a jar containing fixative (equal parts of ether and 95% alcohol) for 20 minutes and then will be sent .Pap will be interpreted as per Bethesda

2) **BETHESDA SYSTEM**

CLASSIFICATION

Classification	Notation
• Negative for intraepithelial lesion or malignancy	•NILM
•Atypical squamous cells of undetermined significance	•ASC-US
•Atypical squamous cells cannot exclude HSIL	•ASC-H
•Low grade squamous intraepithelial lesion	•LSIL
•High-grade intraepithelial lesion	•HSIL
•Squamous cell carcinoma	•SCC

3) **HPV DNA detection in cervical scrape by PCR**

HPV PCR Is carried out by Ampligene HPV detection supplied by Gene 1,Bangalore ,India. A cytology brush is taken and rotated by 360 degree, scraping the squamocolumnar junction. The cytology brush is placed in a container containing the viral transport media prepared by

collecting 5ml sample collection buffer (provided with kit) in a 50 ml of oak ridge tube, this tube is already prepared beforehand.Specimens are transported at 4 degrees centigrade to the laboratory.In the laboratory ,temperature of the specimen is maintained at 4 degrees centigrade for testing within 24hrs and those for long term storage to be kept at -20 degrees centigrade. The sample is then centrifuged at 10,000 rpm for 10 minutes just prior to use and then tested for high risk HPV by a PCR – based method.

4) COLPOSCOPY

These patients will be subjected for colposcopy. The patient will be kept in a dorsal position and the cervix will be exposed by inserting a cusco's speculum. Excess mucus will be wiped off with a cotton swab soaked in saline, cervix will be observed for colour, surface, contour and vascular pattern and cervical biopsy will be taken of abnormal areas

ANNEXURE- 1

PROFORMA

NAME-

AGE-

ADDRESS-

DOMICILE- RURAL URBAN

RELIGION- HINDU MUSLIM OTHERS

CONTACT NO-

EDUCATION STATUS-

SOCIO-ECONOMIC STATUS- UPPER MIDDLE LOWER

PARITY-

LMP-

CHIEF COMPLAINT-

DISCHARGE PER VAGINUM

MENSTRUAL HISTORY

LMP- PAIN-

MENARCHE- LENGTH OF CYCLE-

DURATION-

INTER-MENSTRUAL BLEEDING-

AMOUNT OF FLOW-

CLOTS-

OBSTETRIC HISTORY

AGE AT MARRIAGE

AGE AT FIRST COHABITATION

INTER PREGNANCY INTERVAL

MULTIPLE PARTENERS

PAST HISTORY

FAMILY HISTORY

DRUG HISTORY

O/E-

PR

ICTREUS

BP

CLUBBING

TEMPERATURE

CYNOSIS

RR

LYMPHNODES

PALLOR

EDEMA

CHEST

ANNEXURE II

Informed Consent form

Study Title: **COLPOSCOPIC EVALUATION IN CASES OF PERSISTANT INFLAMMATORY PAP SMEAR.**

Study Number: .....

Subject' Initials: ..... Subject's Name: .....

Date of Birth / Age: .....

Address: .....

(i) I confirm that I have read and understood the information sheet dated ..... for the above study and have had the opportunity to ask questions. [ ]

(ii) I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected. [ ]

(iii) I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose (s) [ ]

(iv) I agree to take part in the above study. [ ]

Signature (or Thumb impression) of the Subject/Legally Acceptable Representative: .....

Signatory's Name:..... Date: ...../...../.....

Signature of the Investigator: .....

Study Investigator's Name: ..... Date: ...../...../.....

Signature of the Witness: .....

Name of the Witness: ..... Date: ...../...../.....

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 11/11/21

Head of Department Dr. mamta Tyagi

Name of Department: Department of Obstetrics & Gynaecology

Name of College: Subharti Medical college.

Findings of the project: (Max-100 words):

In our study, on colposcopic evaluation of patient of persistent inflammatory PAP smear we found that majority of women had Swede score of 5-6 (55%) and 75% women were negative for HPV-DNA and 25% were positive. 69% women had CIN-I, 23% had CIN-2, 5% had CIN-3 & 3% had Squamous cell carcinoma.

External Support: Marc Laboratories Ltd.

Name of PI: Dr. Pavidhi Chandhary

Name of the Department: Department of Obstetrics & Gynaecology

Name of College: Subharti Medical college

Title of the Project: Colposcopic evaluation in cases of Persistant Inflammatory Papsmear.

Duration of the Project: 2 years

Employee Code

Signature of P.I.

Registrar
Swami Vivekanand
Subharti University
MEERUT

DEPARTMENT OF BOTANY

Keral Verma Subharti College of Sciece

Swami Vivekanend Subharti University, Meerut (U.P.)

Principal Investigator (PI): Dr. Anju Rani, Associate Professor

Title of the research Project: Medicinal value of bryophytes

1. Introduction:

Among plant kingdom Bryophytes are second largest group having round about 21000 species all over the world. The use of bryophytes in herbal medicines has been common in India, China, and among Native Americans since earliest times. The chemical composition depends on growth, environment, season and species. Numerous compounds, including polysaccharides, oligosaccharides, amino acids, sugar alcohols, aliphatic compounds, Fatty acids, aromatic, Prenyl-quinones and Phenolic compounds found in Bryophytes. Most commonly uses of Bryophytes are to treat liver problems; Jaundice and inflammation (*Marchantia polymorpha*). Riccia species were used in the Himalayas to treat ringworm. A general lack of commercial value, small size, and inconspicuous place in the ecosystem have made the bryophytes appear to be of no use to most people. The use of bryophytes for therapeutic purpose is not popular. The phyto-medicinal uses of these plants are neglected due to their sizes and distribution pattern. We hope that this abstract provide a baseline for phyto-medicinal researchers to take interest and explore the medicinal importance of these neglected division of Plants in Pakistan.

Objectives:

1. Survey and collection of bryophytes from Western Uttar Pradesh.
2. Prepare herbarium of collected samples.
3. Study medicinal value of collected samples.

2. Review of literature:

Bryophytes are one of the largest and ancient non-vascular plant groups that include the liverworts (Marchantiophyta), hornworts (Anthocerotophyta) and mosses (Bryophyta). Bryophytes (commonly referred to as mosses) are the first dwellers of the land plant history, play a spirited role in ecosystems. Land plants evolved 480 million years ago. First land plants evolved from freshwater algae like ancestors (Sakakibara, 2016). The term 'bryophyte' has its origin in the Greek language, referring to plants that swell upon hydration. The occurrence of bryophytes takes place in wet, humid or boggy areas such as damp rocks, damp land area, forests and tree trunks. With the development of the concept of conservation biology which is closely related to biodiversity, conservation of bryophytes initially and completely overlooked by least amount of scientists and researchers. Bryophytes were first studied centuries ago. And also, nobody has understood the plant life cycle so the conversation among the researchers was disorganized. As a result, the meaning of some of the many terms that have been coined over the years to explain bryophytes is confusing and overlapping. Bryophytes have gained considerable publicity in the past fifteen years at least among scientists. Literary evidence prove the negligence of bryophyte studies; "a lot of time has passed since and most certainly a vast corpus of bryophytes research did not receive the proper attention it deserved, but ever since the publication and availability of the Physcmitrella patens genome(as the fourth genome of land plant after Arabidopsis thaliana (the *Arabidopsis* genome initiative, 2000), *Oryza sativa* (Goff et al, 2002; Yu et al, 2002) and *Populus trichocarpa* (Tuskan et al, 2006) and as the first nonvascular plant genome(Rensing et al, 2008) bryophytes and mosses in particular, again serve as focal points of plant and genome research". -Lang et al, 2016 Thus the vocabulary of bryophytes has developed recently than the early times. Extant bryophytes belong to either liverwort (Marchantiophyta), mosses (Bryophyta in the strict sense) or hornworts (Anthocerotophyta) (Wellman and Gray, 2000). Liverworts are the earliest diverged lineage of land plants, their origin dates back to the Silurian period (Kenrick and Crane, 1997 a, b; Wellman et al, 2003 and Heinrichs et al, 2006). The vegetative gametophyte is either thalloid i.e. ribbon like plants or composed of a leafy stem, with leaves arranged in two or three parallel rows. Specialized water-conducting cells account for endohydric transport in the gametophytes of some taxa (Edwards et al. 2003) but are always lacking in the sporophyte. The sporophyte produces a single sporangium elevated, at maturity, on a seta that grows

primarily by cell elongation rather than extensive cell divisions. The mode of dehiscence of the sporangium varies but typically, the capsule wall splits along four vertical lines. Stomata are always lacking in the sporangial wall. The capsule holds spores and elaters, elongated cells with spiral wall thickenings that are thought to promote spore release. An axial columella is lacking in the sporangium (Vanderpoorten and Goffinet, 2009). They are a rich source of sugar alcohols, aliphatic and aromatic compounds, prenylquinones, phenolics and other secondary metabolites, many of which exhibit extraordinary range of bioactivities and medicinal properties. Several evidences have been reported on the use of bryophytes as herbal medicine by the native inhabitants of China, India and native Americans since the ancient time. Ethno-bryology is now receiving much attention as there is hardly little documented information. This brief review summarises the available reports on the uses of Liverworts and mosses as ethno-medicine by Indian tribal communities such as Adivasi Oriya, Adivasi Telegu, Irula, Muduga, Gaddi, Khamti, Kani and other tribal communities from Himalayan and Melghat Forest region, as well as from several other countries. Common ethno-medicinally utilized Liverworts are *Riccia, Marchantia, Plagiochasma, Targionia, Riccardia, Dumortiera, Reboulia.* Mosses like *Polytrichum, Sphagnum, Bryum, Pogonatum, Rhodobryum, Entodon, Fissidens,* etc., are also popular sources of ethnomedicines.

3. Work Plan:

1. Plants will be collected from different regions of Western Uttar Pradesh.
2. Collected samples will be preserved in the form of Herbarium in the Botany Lab, KVSCOS.

4. Duration of the Project: 1 year

5. Outcome of the project:

Currently, scientific research on medicinal use of bryophytes is being carried out in most pharmaceutical laboratories, research institutes and universities. The current research is going on the active ingredients of medicinal bryophytes are used in curing diseases such as hepatic disorders, skin diseases, cardiovascular diseases, and many more other ailments. Another area of research is directed towards the discovery of new kinds of drugs from the medicinal bryophytes which have not been explored so far this new trend of evaluation and validation of traditional practices with modern knowledge provides significant opportunities for newer drug discoveries and would be an effective strategy for the improvement of human health care.

6. References:

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Name and Sign of Principal Investigator (PI): Dr. Anju Rani

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Date: 05/10/2020

Name of Department:

Name of College: KVSCOS

Findings of the project: (Max-100 words):

Many bryophytes have been found effective against many diseases like skin diseases etc.

External Support: Support financially by K.S Associates

Name of PI: Dr. Anju Rani

Name of the Department: Botany

Name of College: KVSCOS

Title of the Project: Medicinal Value of Bryophytes

Duration of the Project: 01 Year

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

Jai Hind!!

Swami Vivekanand Subharti University, Meerut
(Established under U.P. Govt. Act no. 29 of 2008 and approved under section 2(f) of UGC Act 1956)