Sample Proposal of Research Project

2016-2017

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

MEERUT

GRADE 'A' ACCREDITED BY NAAC

A Research Proposal

On

The Effect of Mobilization with Movement (MWM) versus Conventional Treatment on Range of Motion in Patients with Post-Traumatic Stiffness of Knee Joint

Submitted to

Swami VivekanandSubharti University, Meerut

Name of P.I: SumitRaghav,Assistant Professor
JyotiraoPhuleSubharti College of Physiotherapy

Name of Co-P.I: Anshika Singh, Assistant Professor
JyotiraoPhuleSubharti College of Physiotherapy

INTRODUCTION

Immobilization of human knees for several weeks or more can result in stiffness and diminished range of motion in the joints. This can lead to contracture of muscles and knee instability. [1] Post traumatic stiffness of knee joint is common after knee arthroplasties, cruciate ligament repairs and trauma. [2] Post-traumatic knee stiffness and loss of range of motion is a common complication of injuries to the knee area. The causes of post-traumatic knee stiffness can be divided into flexion contractures, extension contractures, and combined contractures. Post-traumatic stiffness can be due to the presence of dense intra-articular adhesions and/or fibrotic transformation of peri-articular structures. [3]
Limitation of joint movement, both flexion and extension, suggests intra-articular pathology. Sometimes, there may be extra-articular block to flexion (due to bony mass behind the knee) or due to tight quadriceps muscle holding the knee on the front (as occurs in quadriceps fibrosis). [4]Knee stiffness, or more accurately, a limitation in range of motion, is a potential complication after any intra-articular or extra-articular injury. It can be caused by a flexion contracture, an extension contracture or a combined contracture (affecting both flexion and extension) relative to the contra lateral side (if healthy). This stiffness has two components: intra-articular: tissue remodelling leading to intra-articular adhesions, excessive proliferation of fibrous scar tissue, retraction of peri-articular soft tissues and bone impingement due to intra-articular malunion; and extra-articular: quadriceps adhesions to a femoral callus, femoral aponeurosis and inter muscular septum, retraction of the muscle due to scar tissue and skin adhesions in the deeper layers[5].

In cases of limited flexion, one must look for posterior impingement (femoral malunion), anterior adhesions or retractions (joint capsule, quadriceps bursa, patellar retinaculum, quadriceps), and patella baja/infera. Recent knee radiographs are essential: A/P and lateral weight bearing, view of patellofemoral joint. Radiographs of the femur are also needed if it was fractured, along with long-leg standing views. CT arthrography and/or MRI can be useful in characterizing the reasons for stiffness. These can help determine the presence of intra-articular malunion, the capsule volume, and the presence of meniscus, cartilage and ligament injuries [6].

In cases of limited extension (flexion deformity), one must look for anterior impingement (e.g. malunion of the intercondylar eminence), contracture of anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) (retraction of the PCL, which is taut during flexion, primarily limits flexion, unless the PCL insertions were brought closer together due to malunion, in which case, the PCL will also limit extension) and contracture of the posterior joint capsule over the condyles. [7] Patient faces a complication named as stiff knee gait in knee stiffness. Normally, the knee goes in flexion duringthe early stage of swing phase to clear the foot from the ground. But if the knee is stiff during the swing phase, the patient has to raise the affected side pelvis to clear the foot from the ground and swing sideways with circumduction of the limb to propel it forward to reach the heel strike. [8]

There are various regimens to overcome joint stiffness or increase the range of motion of the joint. Previously there were studies done for post traumatic stiffness using conventional therapy such as, continuous passive motion (CPM) is used in overcoming joint stiffness or increasing range of motion of the joint and static progressive stretch using orthosis given to treat contractures of elbow, ankle and knee. [9] Repeated prolonged loading exercises for increasing knee flexion range, active range of movement exercises, isometric quadriceps femoris exercises and knee flexion stretching exercises.

On the other aspect, Physiotherapist's use many mobilization techniques from time immemorial for effectively improving the range of motion of several joints. One such mobilization technique is what Mobilization is with movement (MWM) which is a combination of Mobilizations and movement as advocated by Mulligan. Mobilization with movement is always at right angles to the plane of the movement taking place and will only work in ONE direction - when correct MWM is repeated with three sets of ten repetitions, the joint's option to stay on track seems to return. [10]

Exelby L (1996) says, as per mulligan, mobilization is applied parallel or at right angles to the restricted joint movement. If the applied mobilization achieves immediate improvement in the functional movement and abolishes the pain, the treatment involves sustaining the mobilization while the patient performs the active movement repetitively. On reassessment of the joint function, the movement should remain improved without the mobilization. [11] MWM may be applied to increase ROM and/ or decrease the pain associated with movement by improving joint tracking. Mulligan stated that MWM is more effective with loss of flexion than extension. [12]

OBJECTIVES

1. To find out the effect of MWM and conventional treatment on range of motion in patients with post traumatic knee stiffness.
2. To find out the comparative effect between MWM and conventional treatment on range of motion in patients with post traumatic knee stiffness.

MATERIALS AND METHODS

STUDY DESIGN

This is a pre and post experimental study.

Sample selection: According to the inclusion and exclusion criteria, the convenient sample of 30 patients will be assigned randomly in the study. All patients will be equally allocated in two groups, group A and group B. This study will be conducted in physiotherapy OPD of CSS Hospital, Subharti University Meerut.

Duration of study: 1year

INCLUSION CRITERIA

- Age 22-35 yrs
- Both Male and female

Fracture of unilateral knee joint and around the knee managed with conservative treatment only.

- Subjects with post traumatic stiffness of knee joint having a minimum of 70° knee flexion

EXCLUSION CRITERIA

- Any deformity of hip and knee
- Fracture or dislocation of the knee or in adjacent joints which managed with ORIIF
- Recent injuries on knee or on adjacent areas.
- Implant at fracture and around fracture site
- Neurological problems

□ Subject having polyarthritis, bleeding disorders, tumors, local infection, peripheral vascular disease, leg-length discrepancy of more than one-half inch.

OUTCOME MEASURES

Visual Analogue Scale (VAS)

The visual analog scale is one of the most basic pain measurement tools. It consists of a 10 cm line. The clinician can measure the place on the line and convert into it a score between 0 to 10 where 0 is no pain and 10 is bad as it could be. [13]

Goniometry

It is a technique in which using an instrument named as goniometer purports to measure accurately the movements present in a simple or composite joint. Actually a goniometer is used not so much to measure the exact number of degrees of the movement in a joint as to find out whether there is an increase or a decrease of such movements. In order to do this, it is desirable that a goniometry should provide an easy method of reference to the joint or joints being examined and also provide a fixed base- line point from which to measure any increase or decrease of movement. [14]

TEST PROCEDURE

Visual analogue scale (VAS)

VAS attempt to represent measurement quantities in terms of a straight line placed horizontally or vertically on paper. The endpoints of the line will belabeled with descriptive or numeric terms to anchor the extremes of the scale andprovide a frame of reference for any point in the continuum between intervals between the endpoints to assists the individual in grading responses. Commonly the entire visual analog line is 10 cm long. The patient will be asked to bisect the line at a point representing self-reported position on the scale. The patient score will be obtained by measuring from the zero mark to the mark bisecting the scale.

Range of motion

Active flexion range of motion of affected knee joint will be assessed using a universal goniometer (in degrees). Flexion will be measured in prone lying position. In flexion, lateral condyle of the femur or the lateral aspect of mid joint line of knee will be used as axis of motion. The hip joint will stabilized during flexion and extension by the research assistant in order to avoid movements of the hip joint. The movement will be stopped when the first resistance will be felt.

VARIABLES

Dependent Variables: Pain, Range of Motion (ROM).

PROCEDURE

After getting their informed consent the patients will be assigned randomly and allocate in three groups. Patients for research purpose will be selected according to inclusion and exclusion criteria. According to VAS score and goniometry score, the data of pain and range of motion will be collected and table of selected variants will be prepared and sorting of data will be done. The patients in the both experimental groups, group A and B followed paraffin wax bath (PWB), mobilization with movement (MWM), continuous passive motion (CPM) and range of motion (ROM) exercises of the

knee joint. Group 'A' received PWB and MWM and group 'B' received PWB, CPM and ROM exercises of the knee joint respectively.

In group A, the mobilization with movement (MWM) technique will beimplemented with three sets of 10 repetitions on each treatment occasion for a period of 6 days/ week. In this group, the adjustable couch will be used to treat the patients effectively. During MWM, position of the patients will be prone lying and high sitting position with swinging bilateral leg out of the couch at available various range of motion of affected knee joint. In prone lying position, the therapist will stand just behind the patient towards the affected knee joint. The mulligan belt will be placed at proximal tibial ends which already wrapped with the lower back of the therapist. In high or couch sitting position, the therapist will sitting on resting chair. The method using of mulligan belt will be the same as in prone lying position. After stabilization, the mobilization with movement (MWM) will be started in order with the therapist mobilized the knee joint followed by active movement of knee joint performed by the patients.

In group B, the continuous passive motion (CPM) in mechanical form will be given to the patients. In this group, the duration of CPM will be 40 minutes for improving flexion range of motion of the knee joint. These protocols will be used to accommodate the tolerance level of patients with various degrees of motion. Patients will also instruct to perform home exercises program in three sets of 15 repetitions, twice daily. The exercise program consisting of isometric exercises and stretching exercises will be taught to the patients. The isometric exercises consisted of three exercises using a towel roll. The patients will instruct to perform a total of 10 repetitions. Each repetition lasted6 seconds with an interval of approximately 3 seconds. In the first exercise using the towel roll, the patients will be placed in a supine position with knees flexed. The towel roll will be positioned between the patient's knees, and the patient will instruct to press the knees against the roll to perform a maximal contraction. This exercise will be aimed to strengthen the hip adductor muscles.

In the second exercise, the patients will be placed in a supine position with legs straight. The towel roll that will be place under the ankle of the affected limb, the patients will perform maximal contractions. This exercise will strengthen the hamstrings muscle. In the third exercise, patients will be in supine position with legs straight. The towel roll that will be placed under the knee, patients will ask to press the knee on the roll. This exercise will be performed to strengthen quadriceps muscle. The stretching exercises will be performed actively and included the following muscles and in order: quadriceps (standing knee bent), knee flexion in prone lying position and the hamstring muscles the calf muscle (standing and long sitting with both the knees extended, ankle dorsiflexion with the help of towel) the patients will be instructed to perform these exercise twice/day for 28 days. All data will be evaluated in three consecutive visits: initial evaluation on 1st day, second on 14th day and third or last on 28th day respectively but will be instructed to follow the home exercise program for a total of 4 weeks. The home exercise program will be consisted of hot fomentation along with range of motion exercises of knee joint.

DATA ANALYSIS

All analysis will be obtained using SPSS version 19.0. Demo graphic data of the patients including range of motion and pain will be summarized. The dependent and independent t-test will be used to find out mean differences in pre and post score of VAS and ROM. A level of significance 5% will be used to determine the statistical significance.

Required Instruments

- Couch
- Chair with Back rest
- Stationary (Pen, Pencil)
- Goniometer (Universal type full circle goniometer)
- Consent Form
- Mulligan Belt

REFERENCES

1. Richard W. Bohannan, Debbie Charis, Patricia Larkin, Cynthia Lieber and Lynnette Riddick Effectiveness of repeated prolonged loading for increasing flexion in knees demonstrating post-operative stiffness: A clinical report. American Journal of Physical Therapy 1985 April; 65(4): 494-496.
2. P. Bountti, M Mcgrath, S. Ulrich, S. Mckenzie, T Seyler, M mont. Static progressive stretch for the treatment of knee stiffness. The Knee 2008 June; 15(4) 272-276
3. N.Pujol, P.Boisrenoult, P.Beoufils; post-traumatic knee stiffness: surgical techniques:Orthopaedics& Traumatology Surgery & Research · January 2015.
4. J. Maheshwari; examination of knee joint: Essential orthopaedics, page 313, 3rd edition
5. Mariani P P, Santon N, Roveve P, Della Rocca C, Adriani E; Histological and structural study of the adhesive tissue in knee fibroartrosis: A clinical-Pathological correlation. Arthroscopy 1997; 13(3) 313-8 [E pub 1997/06/01]
6. N.Pujol, P.Boisrenoult, P.Beoufils; post-traumatic knee stiffness: surgical techniques: Orthopaedics& Traumatology Surgery & Research · January 2015
7. N.Pujol, P.Boisrenoult, P.Beoufils; post-traumatic knee stiffness: surgical techniques: Orthopaedics& Traumatology Surgery & Research · January 2015
8. SureshwarPandey, Anil Kumar Pandey, clinical orthopaedic diagnosis, page 216, 3rd edition.
9. Cynthia M. Chiarello, PhD, PT, Linda Gundersen, MS, PT,Terrance O'Halloran, MS, PT; The effect of continuous passive motion duration and increment on range of motion in total knee arthroplasty patients.
10. Brian R Mulligan. Manual therapy: "NAGs", "SNAGs", "MWMs" etc. 5th edition Wellington, New Zealand: Plane view services Ltd; 2004, page 87-88, 115-120
11. Linda Exelby: Peripheral mobilization with movement; Manual Therapy 1(3), page 118-126
12. Carolyn Kisner, Lynn Allen colbey; The knee: therapeutic exercise 5th edition, page 696
13. Susan B O'Sullivan & Thomas J Schmitz: physical rehabilitation, chapter 11, 5th edition, published by Jaypee brothers' medical publishers' ltd,page no. 381.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 11/12/2017

Head of Department ~~Dr~~

Name of Department: ~~Department~~ Department of Orthopedic Physiotherapy

Name of College: Jyotirao Phule Subharti college of Physiotherapy.

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

The Study concludes that both treatment program decrease pain & improve ROM in pt. with post-traumatic knee stiffness. on the basis of statistical analysis the significant difference found from 1st to 14th day and 28th day in VAS and goniometry score which shows MWM is comparative effective than conventional treatment in reducing pain & improving ROM in pt. with post-traumatic knee stiffness.

External Support:

Supported by Entice Way Trade Link pvt. Ltd.

Name of PI: Sumit Raghav

Name of the Department: Orthopedic physiotherapy

Name of College: Jyotirao Phule Subharti college of Physiotherapy Signature of the P.I.

Title of the Project: The effect of MWM VAS conventional Treatment on ROM in pt. with post-traumatic knee stiffness Employee Code of PI:

Duration of the Project: 1 year

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

GSM BASED NOTICE BOARD

PROJECT COMPLETION REPORT

Submitted by

Mr. Amit Kumar

(Principal Investigator)
Assistant Professor
Department of ECE
SITE, SVSU

Mr.Ashirwad Kumar

(Co-Principal Investigator)

2016-17

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Summary Sheet

(i) Name of the Principal Investigator : Mr. Amit Kumar

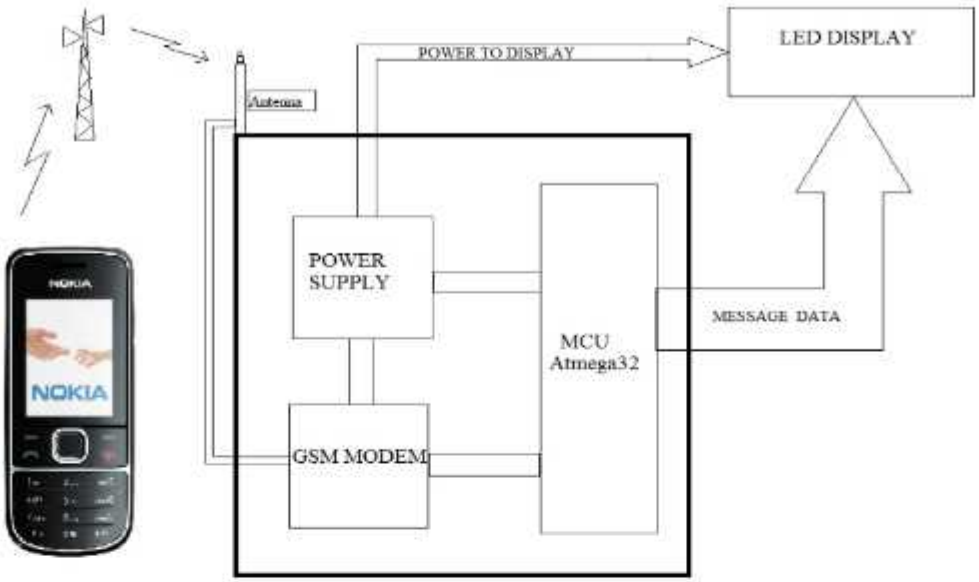
(ii) Institution : Subharti Institute of Technology & Engineering

(iii)Project Title: GSM Based Notice Board

1. Abstract and Introduction:

By using this project it is possible to display a SMS on moving LED pattern. For this project we use GSM modem as a main component. We send the SMS via mobile phone to particular GSM modem. Data from the modem is connected to the microcontroller via SERIAL PORT. Data is get into the microcontroller and store in the memory and then after into the microcontroller. This project is to be divided into two parts. One is GSM modem connectivity and second is moving display board. Some advanced GSM modems like WaveCom and Multitech, support the SMS text mode. This mode allows you to send and receive SMS messages using AT commands, without the need to decode the binairy PDU field of the SMS first. This is done by the GSM modem. A GSM phone or modem receives messages automatically. Basically you are just retrieving the messages from the memory of the device or SIM card.

2. Block Diagram



3. Methodology :

When we send the message from the mobile, the GSM Modem which is connected to the Microcontroller and the display unit, will receive the message. Now, the microcontroller reads the message from the GSM Modem and displays it on LCD. When user sends the message from the mobile, GSM modem sends the below command serially to indicate that a new message is received.

+CMTI: "SM",3

In the above command, number "3" indicates the location of the new message i.e. it is the third message in the inbox. Now you need to read this unread message to display on LCD. The command to read the message from GSM modem is

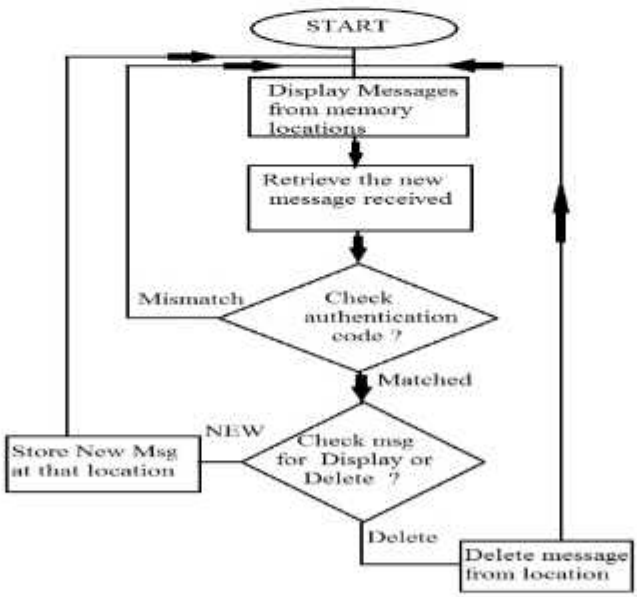
AT+CMGR=3

Here, the number "3" indicates the location of the message to be read. After giving this command to the GSM module, it will send the below command serially.

+CMGR: "REC UNREAD","MD-WAYSMS",,"13/05/20,15:31:48+34"

In the above command, "REC UNREAD" indicates that message is unread message, "MD-WAYSMS" indicates sender mobile number or name, 13/05/20 indicates the date, 15:31 indicates time and Electronics hub is the content of the message.

From the above command we need to extract message (Electronics Hub) sent by the user to display it on the notice board (LCD).



4. Working Description with various sections :

Components Used

- GSM modem (wave com RS 232)
- Microcontroller 89S51 (1)
- LED (224 LED)
- IC 74154 (2)
- IC 74138 (1)
- Transistor BC 548 (32)
- Transistor BC 558 (7)
- Ic 7805 (5 volt regulator)
- Diode (in 4007) (4)
- Capacitor 1000mfd (2), 27 pf (2), 10 mfd (1)
- Resistor 10 k (1) and 1k (40) and 470 OHM (1)
- IC MAX232 (1)
- Crystal 12 Mhtz (1)

MICROCONTROLLER SECTION(ATmega32):

Features:

- Advanced RISC Architecture
- High-performance, Low-power Atmel AVR 8-bit Microcontroller
- 32Kbytes of In-System Self-programmable Flash program memory
- 1024Bytes EEPROM and 2Kbytes Internal SRAM
- Programmable Serial USART
- 32 Programmable I/O Lines
- Full Duplex Serial Line as controller have independent receiver and transmitter registers.

ULN2003

Features:

- ULN2003 is a high voltage and current Darlington array IC
- It contains seven NPN Darlington pairs one for each input
- It is providing current amplification for LED display board
- Collector-Current rating of single darlington pair is 500Ma

The block diagram of the Electronic Notice Board using GSM consists of 8051 Microcontroller, GSM Module (Modem) and 16 x 2 LCD. Here, the 16 x 2 LCD is used to display message and is used in 8 – bit mode. Means, we need 8 data lines to display the data. The data lines of the LCD Display are connected to PORT1 Pins. The control pins RS, RW, and E pins are connected to P3.6, GND and P3.7 pins respectively. The GSM Module is directly connected to the microcontroller as the logic levels of both the GSM Modem and Microcontroller are already matched in the GSM Module Board. If there is no level converter on the board, then we need to use MAX232 level converter as a mediator between Controller and GSM to transfer the data.

5. Conclusion

We can use this Project in college Notice Board, a Professor can send message for the immediate gathering of students at department. It can be used on Highways for traffic control, like traffic on one side of the road may be blocked in view of VVIP movement or jam ahead at Bus Stands, Railway Stations and Airports for the information about the timing of the Buses , trains and airplanes. It can be used for crime prevention.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Name of Department: ECE

Name of College: SITE

Date: 25/02/2018

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

We can use this project in college notice board, a professor can send message for the immediate gathering of students at department. It can be used on highways for traffic control, like traffic on one side of the road may be blocked in view of VVIP movement or jam ahead at bus stands, and airports for the information about timing of buses, train etc.

External Support:

Supported by Indraprastha Private ITI

Name of PI: Er. Amit Kumar

Name of the Department: ECE

Name of College: SITE

Title of the Project: GSM based Notice Board

Duration of the Project: 6 Month

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING
SWAMI VIVEKANAND SUBHARTI UNIVERSITY

Solar PV Analysis with MPPT and DC Motor Application

REPORT

under
Resource Mobilization for Research

Priyanshu Sona

(Co- Investigator)

Er. T.Ramachandran

(Principal Investigator)

Assistant Professor,
Department of EEE,
SITE, SVSU

Summary Sheet

1. **Name of the Principal Investigator:** Er. T. Ramachandran

   Phone No: 7302681952 **Email: ramspower@gmail.com**
2. **Institution :** Subharti Institute of Technology & Engineering
3. **Project Title :** Solar PV Analysis with MPPT and DC Motor Application
4. **Date of Sanction :** 24/11/2017
5. **Abstract :**

Data As of recent study, the enthusiasm for solar energy has ascended because of surging oil costs and natural concern. In numerous remote or immature regions, guide access to an electric framework is inconceivable and a photovoltaic inverter framework would make life considerably more straightforward and more advantageous. Solar energy, brilliant light and warmth from the sun, has been reined by people since antiquated circumstances utilizing a scope of consistently advancing innovations. Solar brilliant energy represents the majority of the usable sustainable power source on earth. Photovoltaic (PV) is a technique for producing electrical power by changing over solar radiation into coordinate current power utilizing semiconductors that display the photovoltaic impact. In this proposition, the PV cluster is demonstrated and its voltage-current attributes and power-voltage qualities are mimicked and enhanced which is utilized to drive a DC machine engine. The primary encumbrance for the compass of Photovoltaic frameworks is their low proficiency and high capital cost. Here we mean to look at a schematic to draw out most extreme possible solar power from a PV module for use in a DC application. The idea of Maximum Power Point Tracking is to be executed which brings about calculable increment in the productivity of the Photovoltaic System. Diverse plans of MPPT calculations, for example, Perturb and Observe, Neural Network are to be examined and executed. The MPPT calculation therefore proposed will recognize the reasonable duty ratio in which the DC/DC converter ought to be worked to get most extreme power yield. The advantage of this theory is to offer access to an everlasting and contamination free use of energy.

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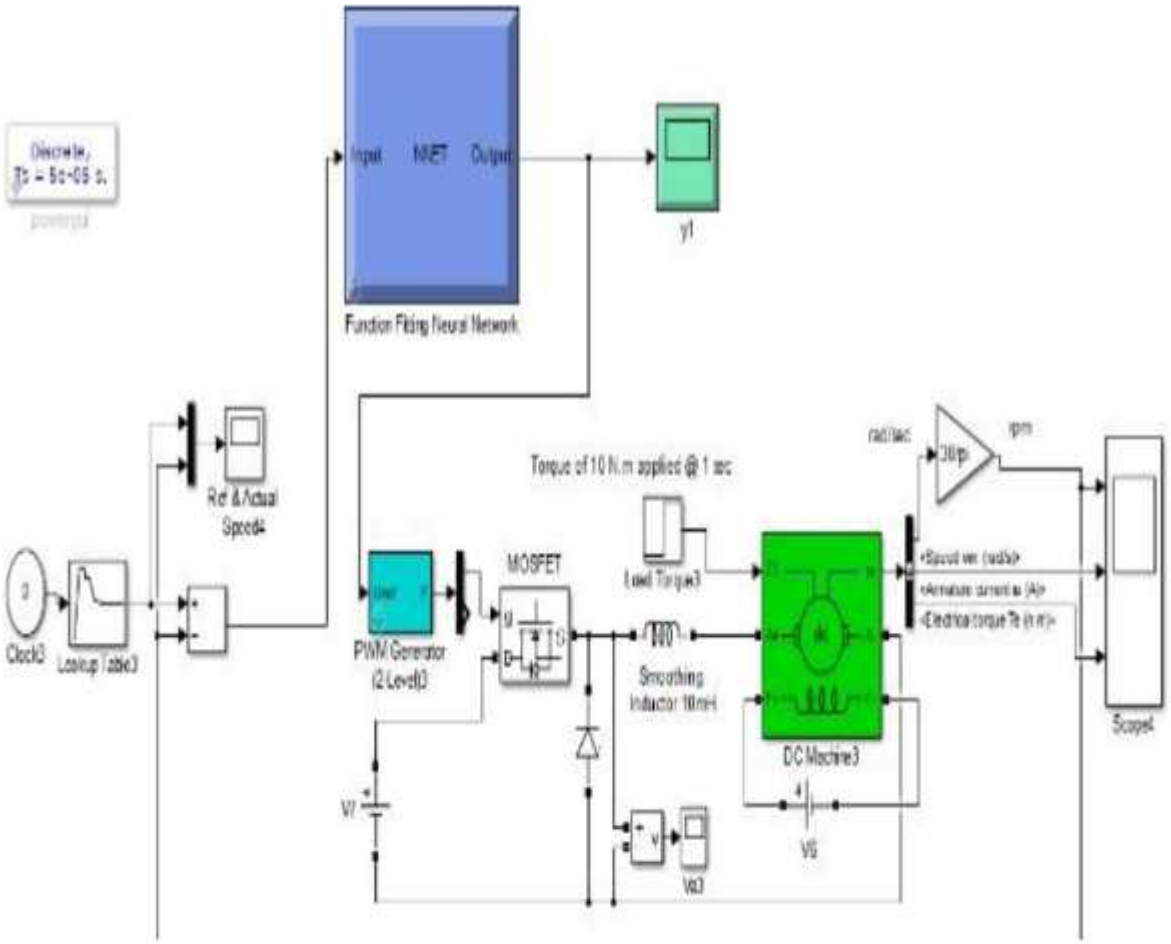
6. Major Work Done

Figure 2 shows model for DC Motor in which speed is controlled by the use of ANN (Artificial Neural Networks). In this model, a look up table is used to give reference speed for DC motor in RPM. Then a ANN based fitting network is used to generate a duty cycle. With the help of this duty cycle, a pulse is generated to give input to the gate of MOSFET of DC-DC converter. The DC Machine of the model consists of torque input armature input and supply input, which gives output in the form of speed in radians/sec which is converted in RPM. The other output is armature current and torque. The outputs of the model in Figure 2 are shown in Figure 3 below. Figure 4 gives model for MPPT in solar PV cell using P and O method, which is used further to control speed of DC Motor. This model consists of pv panel with MPPT using P and O and then fed to a boost converter. The output waveforms are shown in figure 5

7. Methodology :

The final model for PV arrays DC motor speed control is shown in figure 6, In this figure, two pv arrays are input to the boost converter which drive the DC motor to the desired speed in accordance to enabling and disabling of the PV arrays as shown in the figure 6. In this a input stream of irradiance is set in such a way to produce maximum stability and maximum output efficiency at the output. The speed control mechanism of the DC motor is controlled by the two PV arrays which are fed with different irradiance duty cycle and produce a combined output. This duty cycle using a PWM generator controls the behavior of MOSFET gate which in turn controls the output of the boost converter



8. Major outcomes

In this mathematical model of a photovoltaic panel has been developed using MATLAB Simulink to drive DC motor with a specific speed. The P&O and Incremental conductance MPPT algorithms are discussed and their simulation results are presented. It is proved that this method has better performance than simple ANN based DC motor model. These algorithms generally improve the parameters dynamics and steady state performance of the photovoltaic system as well as it improves the efficiency of the BUCK BOOST converter system. The stability period of DC motor is improved by 68.9% improving the efficiency of the system.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 15/09/2018

Head of Department

Name of Department: Electrical and Electronics Engg

Name of College: Subharti Institute of Tech and Engg

Findings of the project: (Max-100 words): Solar energy is consider as one of the most renewable energy resource, where PV panels are used to produce electricity. In this project, the maximum power transfer approach is used to track the more solar energy for the generation of electricity. The generated electric can be used to run a DC motor.

External Support:

Supported by YSSSRF

Name of PI: Er. T. Ramachandran

Name of the Department: EEE

Name of College: Subharti Institute of Technology

Signature of the P.I.

Title of the Project: Solar PV Analysis with MPPT and DC motor and

Employee Code of PI:

Duration of the Project: one year

Registrar
Swami Vivekanand
Subharti University
MEERUT

GRADE 'A' ACCREDITED BY NAAC

A Research Proposal

On

A COMPARITIVE STUDY ON THE EFFECT OF MAITLAND TECHNIQUE VERSUS MULLIGAN TECHNIQUE IN PATIENTS WITH ADHESIVE CAPSULITIS

Submitted to

Swami VivekanandSubharti University, Meerut

Name of P.I: Dr. SumitRaghav, Assistant Professor

JyotiraoPhuleSubharti College of Physiotherapy

Name of Co-P.I: Rupa Singh, MPT student

JyotiraoPhuleSubharti College of Physiotherapy

Introduction

Adhesive capsulitis is a condition of unknown aetiology characterized by a progressive, painful restriction of all joint motion, chronicity and slow spontaneous restoration of partial or complete motion over months to year[1].When the cuff or the intra-articular biceps tendon in rendered ineffective by tears, degeneration and elongation, plus superimposed muscles weakness (result of inactivity), the upward thrust of the deltoid act alone and, at about 45^0 of abduction, the tuberosity impinge on the coraco-acromial arch, and further gleno-humeral movement is limited[2]. The Pattern in which frozen shoulder usually is developed may be described as 3 times periods of six months[3].First phase, freezing phase shows as insidious onset where pain is dominating the clinical picture. Subacromial impingement is initially suspected because of the involvement of the subacromialbursa.At the end of this period range of motion becomes limited in the typical way and diagnosis is usually no longer a problem.This can last anywhere from 6 to 9 months[4]. Second phase, frozen Phasewhich shows reduction of pain but the restricted mobility remains.This stage can last 4 to 12 months.Third and last phase, throwing phase that includes successive re-establishment of normal or near normal range of motion. This can take anywhere from 6 to 2 years[5].Adhesive capsulitis rarely occurs before age of 40 year unless an acute age of trauma followed by long periods of inactivity and anxiety or trauma[6].Frozen shoulder occurs mostly between the age group of 40 to 60 year[7]. Women are affected more than men, the fact that women are more frequently affected, since women are more predisposed to developing thoracic kyphosis than men with adhesive capsulitis of shoulder joint[8].Sedentary workers are more affected than labours from adhesive capsulitis[9]. Among neck pain, low back pain and knee osteoarthritis, adhesive capsulitis of shoulder joint is the most common musculoskeletal disorder faced by the elderly population globally. So, there is need of physiotherapeutic approach to give potential benefit in the management of adhesive capsulitis. The purpose of this study was to evaluate the effect of Maitland technique versus Mulligan's technique in reducing pain and disability in patients with adhesive capsulitis of shoulder joint.

Objective

To evaluate the comparative effect of Maitland technique and Mulligan's technique in reducing pain and disability in patient with adhesive capsulitis

Hypothesis

Experimental Hypothesis

There will be significant difference between effect of Maitland technique and Mulligan's technique in reducing pain and disability and improving range of motion in patients with adhesive capsulitis of shoulder joint.

Null Hypothesis

There will be no significant difference between the effect of mulligan's technique versus Maitland technique in reducing pain and disability and improving range of motion in patients with adhesive capsulitis of shoulder joint.

Methodology

It is pre and post experimental design study. The patients will be diagnosed with adhesive capsulitis of shoulder joint which shows signs and symptoms and will be requested to participate in study. The total number of patients 46 will be enrolled in this study but on the basis of inclusion and exclusion criteria 30 subjects both male and female will be included with the ratio 10:20. Patients will be equally divided into two groups,group A and group B respectively. Group A, will receive Maitland technique and group B will receive Mulligan's technique. Moist heat pack and conventional exercises will be given to both groups.Purpose of this study will be explained to the patients. An informed consent will be taken from each patient prior to participate in this study. This study will be conducted atphysiotherapy OPD, ChhatrapatiShivajiSubharti hospital, Swami VivekanandSubharti University, Meerut India.

Duration of study: 1year

Selection criteria

Patients with age between 40 – 60 year, ender both male and female, history of pain up to 4 months, Mean range of motion (ROM) of shoulder joint upto these degree's -flexion – 70,extension –30abduction – 70, lateral rotation – 30, medial rotation – 30 will be included.Age not above 60 years, trauma to cervical spine, trauma to shoulder joint, fracture to shoulder joint, any nerve compression, systemic conditions like hypertension, Diabetes Mellitus and cardiac disease, any surgery procedure around the shoulder joint, Rheumatoid disorder, bone and joints tumourscongenital and acquired deformity at shoulder joint will be excluded in this study.

Protocol

After assessment of the patients, initially moist heat pack will be given for 10 minutes for both groups to reduce muscle tightness and pain and to help improve extensibility of tissues. Position of the patient will be supine lying on the plinth or sits on chair. Perform a skin sensation test over the neck region to be treated, wrap the heat pack in a towel (two layers) apply the heat pack over the shoulder region to be treated if the quick feels excessive hot to the patient or the therapist will detect distinct skin colour change, more towelling will be added or the hot pack will be removed and check the area after 5min.

Group A

Maitland technique

Position of the patients will be supine lying and therapist will stand towards the affected shoulder joint while improving all movements except extension which will be performed in prone lying position.

1. To perform Flexion

One hand will stabilise the gleno-humeral joint and another hand will hold distal part of forearm and therapist will do flexion while do the movement therapist elbow supports the patient elbow, and do movement up to no pain, then slightly increase the ranges.

To perform Medial rotation

Shoulder will beabducted upto its maximum range and elbow will be flexed at 90 degree. One hand will hold the distal part of the wrist another hand of therapist the elbow and form the same hand its elbow support the shoulder. From which hand the therapist will hold the wrist do the external rotation upto range then increase the ranges.

To perform Abduction

Patient will be in supine lying position and therapist stand towards the affected side. One hand will stabilise the gleno-humeral joint and another hand hold distal part of for humerus and therapist will do abduction up to no pain, then slightly increase the ranges.

To perform Lateral rotation

Shoulder will beabducted upto 90 degree and elbow flexed 90 degree. Therapist will stand towards the affected side. One hand hold the distal part of the wrist another hand of therapist the elbow and form the same hand its elbow will support the shoulder. From which hand of the therapist will hold the wrist do the lateral rotation upto range then increase the ranges.

To perform Extension

One hand will stabilise the glenohumeral joint and another hand will hold distal part of forearm and therapist will do extension up to no pain then slightly increase the ranges.

Group B

Mulligan's technique

To perform Flexion

Patient will be in seated position and therapist stand in unaffected side with one hand placed the medial end of the affected side scapula and another thenar and hypothenar eminence of another hand placed along lateral border of scapula. Therapist will ask the patient to raise his/her arm up from his side while therapist applies a postero-lateral glide, force overthe head of humerus with the hand.

To perform abduction

Patient position will be in seated position. Therapist will stand towards unaffected side with one hand over his affected scapula and the thenar eminence of other hand will be placed over the head of humerus. Therapist will ask the patient to raise his/her arm from front while therapist will applied a postero-lateral glide, force over the head of humerus with the hand.

To perform internal rotation

Patient will be in standing position. Therapist will stand facing the patient's affected side. Place right thumb over his/her will flexright elbow. His/her hand will be as far behind his back as possible. Now place the fingers and thumb in patient's axilla. Now glide the head of humerus down in the glenoid fossa using right thumb while stabilising the scapula with left hand. Make sure left hand will be stabilized up and inwards. While this distraction will taking place, the patient will internally rotate his/her shoulder, with the help of another hand.

To perform external rotation

Patient will besupine and placed his /her shoulder up to its maximum range. Therapist will stand towards affected side. Therapist will grasp the distal part of humerus posteriorly and another hand will be placed over the axilla and give distraction perpendicularly to the sternum. Therapist will instruct the patient to do external rotation upto its maximum range.

To perform extension

Patient will be instanding position the patient's hand their back to the movement limitation or pain onset. Therapist will also be in standing on the same as the affected shoulder and facing the patient, place web space of one hand up into the axilla to stabilise the scapula in a medial and superior direction. And another hand will be placed in the cubital fossa of the patient flexed elbow, with the palm facing towards the therapist. Patient will asked to take his/her hand backward upto the pain free range.

Data analysis

All analysis will obtained using SPSS version 20.0. The dependent variables for the statistical analysis will be disability and ROM. A base line data will be taken at the beginning of the study (pre-test values) and after the completion of the treatment (post -test values) to analyze the difference between the two treatment groups; independent t-test was used. A level of 5% will be used to determine the statistical significance.

References

[1] Hussein ZA. Efficacy of mobilization techniques and range of motion in patients with adhesive capsulitis of the shoulder pain. *Int J Res Pharm Sci*. Epub ahead of print 2019. DOI: 10.26452/ijrps.v10i1.1825.

[2] Kim JY, Rhee SM, Rhee YG. Accuracy of MRI in diagnosing intra-articular pathology of the long head of the biceps tendon: Results with a large cohort of patients. *BMC Musculoskelet Disord*. Epub ahead of print 2019. DOI: 10.1186/s12891-019-2654-5.

[3] Hanchard NCA, Goodchild L, Thompson J, et al. A questionnaire survey of UK physiotherapists on the diagnosis and management of contracted (frozen) shoulder. *Physiotherapy*. Epub ahead of print 2011. DOI: 10.1016/j.physio.2010.08.012.

[4] Abramovitch, A., Anholt, G. E., Cooperman, A., van Balkom, A. J. L. M., Giltay, E. J., Penninx, B. W., & van Oppen, P. (2019). Body mass index in obsessive-compulsive disorder. Journal of Affective Disorders, 245 145–151. https://doi.org/10.1016/j.jad.2018.10.116, Affleck, A., & Stewart, M. (2016). Body dysmorphic disorder in dermatology: Beware of diagnostic overlabelling. Clinical and Experimental Dermatology, 41(2) 214–215. https://doi.org/10.1111/ced.12685, Aguilar-Gaxiola, S., Loera, G., Geraghty, E. M., Ton, H., Lim, C. C. W., de Jonge, P., … Scott, K. M. (2016). Associations between DSM-IV mental disorders and subsequent onset of arthritis. Journal of Psychosomatic Research, 82 11–16. https://doi.org/10.1016/j.jpsychores.2016.01.006, et al. Gender related differences in obsessive-compulsive disorder: A clinical study on a sample of 415 patients. *Quad Ital di Psichiatr*.

[5] Nagy MT, MacFarlane RJ, Khan Y, et al. The Frozen Shoulder: Myths and Realities. *Open Orthop J*. Epub ahead of print 2013. DOI: 10.2174/1874325001307010352.

[6] Miftari S, Lahu N. *THE ROLE OF PHYSIOTHERAPY IN TREATMENT OF FROZEN SHOULDER*. 2019.

[7] Giannakos A, Lazovic D, Beuchel M. Prognosis of arthroscopic capsular release for refractory frozen shoulder. Assistance for estimating postoperative treatment and expected clinical result for different etiologies and preoperative range of motion. *Obere Extrem*. Epub ahead of print 2009. DOI: 10.1007/s11678-009-0023-y.

[8] Hand C, Clipsham K, Rees JL, et al. Long-term outcome of frozen shoulder. *J Shoulder*

Elb Surg. Epub ahead of print 2008. DOI: 10.1016/j.jse.2007.05.009.

[9] Rauoof MA, Lone NA, Bhat BA, et al. Etiological factors and clinical profile of adhesive capsulitis in patients seen at the Rheumatology clinic of a tertiary care hospital in India. *Saudi Med J*.

[10] Moon G Do, Lim JY, Kim DY, et al. Comparison of Maitland and Kaltenborn mobilization techniques for improving shoulder pain and range of motion in frozen shoulders. *J Phys Ther Sci*. Epub ahead of print 2015. DOI: 10.1589/jpts.27.1391.

[11] Doner G, Guven Z, Atalay A, et al. Evaluation of mulligan's technique for adhesive capsulitis of the shoulder. *J Rehabil Med*. Epub ahead of print 2013. DOI: 10.2340/16501977-1064.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 20/12/2017

Head of Department

Name of Department: Department of orthopedic Physiotherapy

Name of College: Motirao Phule Subharti college of Physiotherapy.

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

4 weeks, both manual technique resulted in significant effect in both groups individually in improving range of motion and decrease pain & disability but Group B received Mulligan Technique showed statistically more significant difference in pre to post SPADI and ROM score in order to decrease pain, disability and increase in ROM.

External Support:

Support received from Entice Way Trade Link pvt. Ltd.

Name of PI: Sumit Raghav.

Name of the Department: Department of orthopedic Physiotherapy

Signature of the P.I.

Name of College: Motirao Phule Subharti college of Physiotherapy.

Title of the Project: A comparative study on effect of Maitland and Mulligan Technique in pt. with Adhesive Capsulitis of Shoulder.

Employee Code of PI: -

Duration of the Project: 1 year.

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

IOT BASED SMART LED STREET LIGHTING

PROJECT COMPLETION REPORT

Submitted by

Mr. Rajesh Parihar

(Principal Investigator)
Assistant Professor,
Department of ECE
SITE, SVSU

Mr. Abhilash Gaur, Kumari Shivani, Shivani Jayant

(Co-Principal Investigator)

2016-17

Index

Summary Sheet

(i) Name of the Principal Investigator : Mr. Rajesh Parihar

(ii) Institution : Subharti Institute of Technology & Engineering

(iii)Project Title: IOT Based Smart LED Street Lighting

1. Abstract and Introduction:

Smart LED street lighting system aims for designing and executing the advanced development in IOT for energy saving of street light, the best solution for electrical power wastage is automation of street light, the manual operation of the lighting system is completely eliminate. A method for modifying street light illumination by using sensor at minimum electrical energy consumption ,when object presence is detected, street lights glow at their brightest mode, else they stay in the dim mode during night time Internet of things (IOT) is used to visualize the real time updates of street processing and notifying the changes occur. This shall reduce heat emissions, power consumption, maintenance and replacement costs and carbon dioxide emissions.

Due to high precision in performing different tasks and can perform multitasking work in same; s smart Street light system has been widely used. This technology has grown exponential every year and some competition is held selecting the best controller and wireless Communication. Modern design to perform specific task within period of time. This operation is done everywhere because a lot of human involvement reduced. Smart Street Light system using IOT is defined as a simple street light which automatically ON/OFF and can handle faults with extreme care using exceptional handling. Here the information is transferred pint –to point using Wi-Fi transmitters and receivers and is sent to a server use to Control and monitoring the status of the street lamps and to take appropriate measures in case of failure. Thus system allows substantial energy.

2. Block Diagram

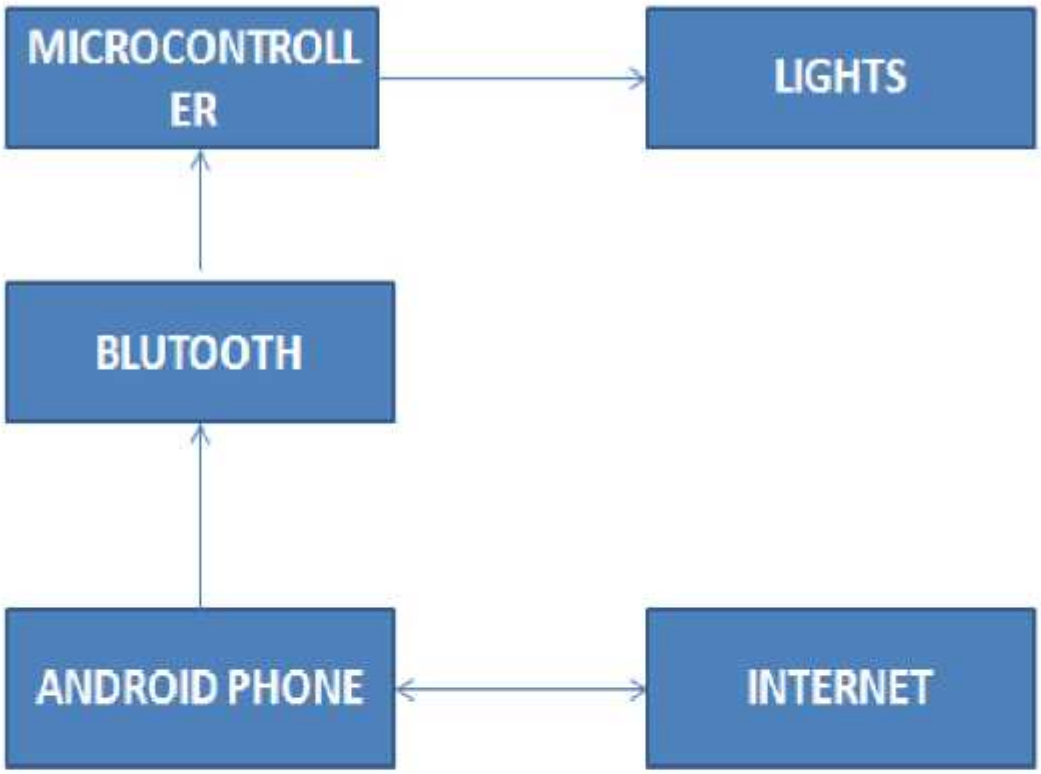


Fig1 Block diagram of IOT based street light

3. Methodology :

The work aims at unification of the three prospects, making an intelligent lamppost managed by A IOT based controlled system that uses LED-based lightweight supply and is powered by transmission line or battery. The management is implemented through a network of sensors to gather the relevant info associated with the Management and maintenance of the system, transferring the data in wireless mode using the Wi-Fi protocol (which has been chosen among numerous alternatives because it is the most convenient, see clarification below). The Wi-Fi remote sensing and management systems are widely described in the literature; we can cite here as examples the applications for the lighting systems.

Many mainstream processor applications need ever increasing levels of performance to handle higher data rates, more media services and new features such as cryptography and security utilizing a rich user interface. Since consumer demand is the main driver of product development in this application space, a big challenge for manufacturers is to reduce the cost of end products. This isn't just a competitive issue: it is also about opening up new markets in developing countries where disposable income is much lower than in the west.

4. **Working Description with various sections :**
   1. Microcontroller Unit
   2. Bluetooth Unit
   3. GSM Module/Android Phone
   4. Lights

1. MICROCONTROLLER SECTION:

Requires three connections to be successfully done for it's operation to begin.

1. **+5v supply:** This +5v supply is required for the controller to get start which is provided from the power supply section.
2. **Crystal Oscillator:** A crystal oscillator of 4 MHz is connected at pin no.9, and pin no.10, to generate the frequency for the controller. The crystal oscillator works on piezoelectric effect.The clock generated is used to determine the processing speed of the controller. Two capacitors are also connected one end with the oscillator while the other end is connected with the ground. As it is recommended in the book to connect two ceramic capacitor of 22 pf to stabilize the clock generated.
3. **Reset section:** It consists of an RC network consisting of capacitor and one resistance . This section is used to reset the controller.

2. BLUETOOTH UNIT

HC-05 Bluetooth module, this module is capable of communicating with pc, mobile phone or any other Bluetooth enabled device. It is interfaced with the microcontroller over the serial UART port of micro-controller. Bluetooth is a wireless communications protocol running at 2.4 GHz, with client-server architecture, suitable for forming personal area networks. Bluetooth is an extremely integral feature designed for low power devices. Bluetooth is a standardized feature or specification that is available in all Smartphone running on android, laptops and computers. It is very handy as it can be easily fitted with a module to allow Bluetooth communication. Bluetooth is the only appropriate communications protocol that has no fear of getting the frequency interferences because it uses the MAC Address of the device i.e. Bluetooth allows the connectivity between two devices using their MAC Address.

5. Conclusion

i. In this project the new technologies are integrated to offering ease of maintenance and energy savings and it is appropriate for street lighting in remote as well as urban areas where traffic is low at times.

ii. Wireless Sensor networks may present a new solution to bring the installed cost down and to ensure energy efficiency

iii. Smart Street lighting application presented in this article describes a full system solution to efficiently manage a public street lighting network. It quickly allows to build up own system thanks to provided Hardware and Software materials.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Name of Department: ECE

Name of College: SITE

Date: 11/03/2018

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

This project describes a full system solution to efficiently manage a public street lighting network. It quickly allow to build up own system. It present a new solution to bring the installed cost down and to ensure energy efficiency. It is appropriate for street lighting in remote as well as urban area where traffic is low at times

External Support:

Supported by Indraprastha Private ITI

Name of PI: Er. Rajesh Parihar

Name of the Department: ECE

Name of College: SITE

Title of the Project: IOT based Smart LED Street Lighting

Duration of the Project: 8 Month

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

GRADE 'A' ACCREDITED BY NAAC

A Research Proposal

On

Eccentric Loading Response in Achilles Tendinopathy: A quasi-experimental Study

Submitted to

Swami VivekanandSubharti University

Name of P.I: Dr. SumitRaghav, Assistant Professor

JyotiraoPhuleSubharti College of Physiotherapy

Name of Co-P.I: Dr. Anshika Singh, Assistant Professor

Jyotirao Phule Subharti College of Physiotherapy

INTRODUCTION

Achilles tendinopathy is a prevalent overuse injury that usually presents between the ages of 30 and 60 years . Many causes oftendinopathy have been proposed, but the etiology has not yet been elucidated fully. Some proposed mechanisms include hypoxia, oxidative stress, hyperthermia, excessive apoptosis, inflammation, and matrix metalloproteinase imbalance. In the past, the term tendinitis was used widely because the etiology of this condition was thought to be associated with an inflammatory process. However, in most cases, the tendon involved shows no signs of inflammation but instead shows fibroblasts, vascular hyperplasia, hypercellularity, and disorganized collagen. The affected tendon also shows an increased infiltration of new blood vessels, which is known as neovascularization. With these changes identified, tendinopathy has been accepted as a more appropriate term. In one study, histopathologic findings were similar when comparing patellar and Achilles tendinopathy, which suggests that tendinopathy has a similar appearance at different body regions. The source of pain in tendinopathy is unknown. Theories on the causes of pain in tendinopathy suggest that a combination of mechanical and biochemical factors may play a role. Tendon degeneration with mechanical breakdown of collagen could theoretically generate pain. Chemical irritants and neurotransmitters also have been proposed as causing pain. These include lactate, glutamate, and substance P, all of which have been found to be elevated in tendinopathy. More recently, the nonneuronal cholinergic system has been implicated as a factor in chronic tendinopathy with evidence of both acetylcholine and a marked increase of muscarinic receptors; however its role in painmechanisms is unclear.

The current most common therapeutic exercise regimen for treatment of tendinopathy involves mechanically loading thepainful or abnormal tissue with the use of eccentric exercises. Eccentric exercises involve lengthening of the musculotendinousunit while a load is applied to it. While eccentric muscle strengthening has been used for some time, until recently, little was known about how eccentric exercises result in decreased pain and normalization of the tendon in those with tendinopathy. In recent years, eccentric training has gained popularity as an effective intervention for Achilles tendinopathy. Eccentric muscle action is a lengthening muscle contraction. The muscle fiber (sarcomeres) cross bridges are at their maximal overlap at the beginning of the contraction; therefore, the eccentric contractiongenerates more tension than both concentric and isometriccontractions."It has been proposed that possible explanations for the positive effects of eccentric training on tendinitis might beeither an effect of stretching, with a lengthening of the muscle tendon unit, and consequently less strain during ankle jointmotion, or hypertrophy and increased tensile strength in the tendon. It is this concept that may explain the possible remodelingeffect of the tendon due to the eccentric exercise. Eccentric training has been identified as an important part of clinicalrehabilitation of chronic tendinopathy, particularly of the Achilles tendon at the midportion .

MATERIALS AND METHOD

Study Design

This is a pre and post quasi-experimental study.

Sample selection: According to the inclusion and exclusion criteria, the convenient sample of 30 subjects will be assigned randomlyin the study. This study will be conducted in physiotherapy OPD of CSS Hospital, Swami VivekanandSubharti University Meerut.

Duration of Study: 1year

Inclusion Criteria
Age between 18-30yrs
Both Male and female

Exclusion Criteria
Any deformity of foot and ankle,Any neurological problem and peripheral vascular disease,History of fracture or trauma and surgery to lower limbSubject having calcaneal spur and planter fasciitis rheumatoid arthritis generalized polyarthritis, Reiter syndrome, bleeding disorders, severe endocrine disease, tumor, local infection, advanced peripheral vascular disease, previous Achilles tendon surgery, ankle arthrodesis, hindfoot fracture, or leg-length discrepancy of more than one-half inch.

Variables
Dependent Variables: Pain, Severity

OUTCOME MEASURES

VISUAL ANALOGUE SCALE (VAS)
The visual analogue scale is one of the most basic pain measurement tools. It consists of a 10 cm line. The clinician can measure the place on the line and convert into it a score between 0 8 to 10 where 0 is no pain and 10 is bad as it could be.

VISA-A QUESTIONNAIRE
The VISA-A aims to evaluate the clinical severity for patients with chronic Achilles tendinopathy. It is an easily self-administered questionnaire that evaluates symptoms and their effect on physical activity. It can be used to compare different populations with chronic Achilles tendinopathy, and facilitate comparisons between studies. It can be used to determine the patient's clinical severity and provide a guideline for treatments as well as for monitoring9 the effect of treatment. The VISA-A is very user friendly, as it generally takes less than five minutes to complete, even for patients with chronic and severe symptoms. The questionnaire represents a valid, reliable and disease specific questionnaire to measure the condition of the Achilles tendon, but it is not a diagnostic tool. The final version of the questionnaire was named the Victorian Institute of Sport Assessment-Achilles Questionnaire.

Test Procedure

Self-administered questionnaire
The self-administered questionnaire was employed to assess severity of Achilles tendinopathy. This included a tendon-specific,VISA-A questionnaire. The questionnaire contains eight questions, covering three necessary domains: 1) pain, 2) functional status, and 3) activity (= three significant domains of dysfunction):

Time to complete: 5 minutes.
Scoring: The maximum score that can be achieved on the question is 100, and would be the score of person who is completely asymptomatic. A lower score indicates more symptoms and greater limitation of physical activity.

Visual analogue scale (VAS)
VAS attempt to represent measurement quantities in terms of a straight line will be placed horizontally or vertically on paper. The endpoints of the line will be labeled with descriptive or numeric terms to anchor the extremes of the scale and provide a frame of reference for any point in the continuum between intervals between the endpoints to assists the individual in grading responses. Commonly the entire visual analog line is 10 cm long. The patient will be asked to bisect the line at a point representing self-reported position on the scale. The score will then obtained by measuring from the zero mark to the mark bisecting the scale.

PROCEDURE

After getting their informed consent, the subjects will be assignedrandomly. Subjects for research purpose will be selected according to inclusion and exclusion criteria. According to VAS score and VISA-A questionnaire score, the data of pain and severity of Achilles tendinopathy will be collected and table of selected variants will be prepared and sorting of data will be done. All patients will beseen for two visits: initial evaluation, 1 day and 21 day but were instructed to follow the home exercise program for a total of 3 weeks. The home exercise program will consisted of gastrocnemius, soleus, and hamstring self-stretching, ice massage on the Achilles tendon twice a day (5-10 minutes). Patients willbe instructed to perform each stretch for three repetitions (30 seconds) twice day.

The patients in the experimental group will follow everything in the control protocol with the addition of eccentric loading exercises. Inthis, the patient will stand bearing weight on the involved foot in plantarflexion with the knee slightly bent; the patient then slowly will lowered the heel into dorsiflexion to a count of five. The other leg will be used to assist the patient in returning to plantarflexion. Again, the patient will lowered the heel to a count of five into dorsiflexion. If too weak to hold the single leg in plantar flexion, the patient stood with the heel off a step as high as possible (which might be neutral) and slowly lowered the heel to a count of five. Patients will be instructed to perform exercises in two sets of 15 repetitions, twice daily. This protocol will be used to accommodate the tolerance level of patients with various levels of activity,including those participating in recreational sports or those who will perform manual labor.

DATA ANALYSIS
All analysis will be obtained using SPSS version 20.0. Demo graphicdata of the patients including pain and severity will besummarized. A base line data will be taken and analyze. The

paired **t-test** will be used to find the mean differences of pre and post score of VAS and VISA-A questionnaire. A level of **0.05**will be used to determine the statistical significance.

Required instruments

- Couch
- Stool
- Wedge Board
- Stationary (Pen, Pencil)
- Consent Form

REFERECES

1. Alfredson H Chronic midportion Achilles tendinopathy; an update on research and treatment. Clin Sports Med. 22:727-741, 2003 [PubMed]
2. Sharma P, Maffulli N. Tendon injury and tendinopathy: healing and repair. J. Bone Joint Surg. 2005; 87:187Y202.
3. Skjong CC, Meininger AK, Ho S. Tendinopathy treatment: where is the evidence? Clin. Sports Med. 2012; 31:329Y50.
4. Maffulli N, Vittorino T, Capasso G, et al. Similar histopathologicalpicturein males with Achilles and patellar tendinopathy. Med. Sci. Sports Exerc.2004;
36(9):1470Y5.
5. Bisset L, Paungmali A, Vincenzio B, Beller E. A systematic review and metaanalysis of clinical trials on physical interventions for lateral epicondylalgia. Br. J. Sports
Med. 2005; 39:411Y22.
6. Alfredson H Pietila T Jonsson P Lorentzon R Heavy-load eccentric calf muscle training for the treatment of chronic Achilles tendinosis. Amer J Sports Med.
1998;26:360-366 [PubMed]
7. Stanish WB Rubinovich RM Curwin S Eccentric exercise in chronic tendonitis. ClinOrthopRelat Res. 1986;208:65-68 [PubMed]
8. Susan B O' Sullivan& Thomas J Schmitz: physical rehabilitation, chapter 11, 5th edition, published by Jaypeebrothers medical publishers ltd, page no. 381.
9. Silbernagel KG, Thomeé R, Karlsson J. Cross-cultural adaptation of the VISA-A questionnaire, an index of clinical severity for patients with Achilles tendinopathy,
with reliability, validity and structure evaluations.BMC MusculoskeletDisord. 2005 Mar 6;6:12.
10. Stanish WD, Rubinovich RM, Curwin S. Eccentric exercises for chronic tendinitis. Clin.Orthop.Relat. Res. 1986; 208:65Y8.
11. Komi PV, Buskirk ER. Effect of eccentric and concentric muscle conditioning on tension and electrical activity of human muscle. Ergonomics.1972; 15:417Y34
12. Alfredson H, Pietila T, Jonsson P, et al. Heavy-load eccentric calf muscle training forthe treatment of chronic Achilles tendinosis. Am. J. Sports Med.1998; 26:360Y6.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 15/12/2017

Head of Department

Name of Department: Department of Orthopedic Physiotherapy

Name of College: Jyotirao Phule Subharti College of Physiotherapy

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

This study states that eccentric loading decrease pain & disability severity in patients with Achilles tendinopathy. It is concluded that the eccentric loading is effective in reduction of pain & severity in Achilles Tendinopathy. Significant difference was found between 1st to 21st day in VAS and VISA-A score. This study supports the experimental hypothesis.

External Support:

Supported by Entice Way Trade Link pvt. Ltd.

Name of PI: Sumit Raghav

Name of the Department: Department of orthopedic Physiotherapy Signature of the P.I.

Name of College: Jyotirao Phule Subharti college of Physiotherapy Employee Code of PI: —

Title of the Project: Eccentric loading response in Achilles Tendinopathy.

Duration of the Project: 1 year

Registrar
Swami Vivekanand
Subharti University
MEERUT

Development and Validation Of Hplc Method For Estimation Of Fluconazole In Solid Dosage Form

Project Investigator: Dr Viktant Verma

Background:

Fluconazole1 is chemically 2-(2,4-difluorophenyl)-1,3-bis(1H-1,2,4-triazol-1-yl)-2-propanol, a synthetic triazole derivative antifungal agent that has been shown to be effective against a wide range of systemic and superficial fungal infections, following both oral and intravenous administration2. GC3,4 and HPLC5-7 methods for the determination of fluconazole in biological fluids, HPLC for eye drops8 and creams9, UV spectrophotometry for syrups10, capsules and intravenous solution11, and microbiological assay for capsules12 are some of the methods reported for analysis of fluconazole. There is however no reported HPLC method for the analysis of fluconazole in solid dosage forms (capsules and tablets). This paper describes a validated HPLC method for the quantitative determination of fluconazole in solid dosage forms. This paper also reports a new validated UV spectrophotometric method for the uantitative determination of fluconazole in capsule dosage forms. The proposed HPLC method fulfilled the requirements of analytical parameters necessary to be applied to the content uniformity tests for finished pharmaceutical products in the study and hence can be successfully applied for routine quality control. The proposed UV method however was found satisfactory only for capsule dosage forms.

METHODS

Equipment Used : Agilent HPLC (LC-10 AT *VP*) system; LC system used consist of pump with universal loop injector (Rheodyne 7725 i) of injection capacity 20 µl. Detector consists of photodiode array detector SPD-10 AVP, the reverse phase column used was Luna C_{18} (5µM, 25cm×4.6mm i.d) phenomenex, USA, at ambient temperature.

Preparation and selection of Mobile phase: The preliminary isocratic studies on a reverse phase C18 column with different mobile phase combination of acetonitrile and phosphate buffer pH 7.0±0.1 were studied for simultaneous separation of both the drugs. The optimal composition of mobile phase determined to be acetonitrile: buffer (30:70v/v) and the pH was adjusted to 7.0±0.1 by addition of triethylamine and was filtered through 0.2 micron membrane filter.

Preparation of calibration curves: Stock solutions of Fluconazole awas prepared by dissolving 10 mg of each in mobile phase and the volume were made up to 10 ml by mobile phase. From the above stock solutions, dilutions were made in the concentration range of 0.0625 to 6 µg/ml of Fluconazole. All solutions were stored at room temperature; these solutions were shown to be stable during the period of study. A volume of 20 µl of each sample after filtration by 0.2 micron membrane filter was injected into column. All measurements were repeated five times for each concentration and respective calibration curves were constructed by plotting the peak area versus the corresponding drug concentration. The slope and correlation coefficients were determined, which were found to be 0.9986 for Fluconazole.

Analysis of Capsule Dosage form: To determine the content of Fluconazole in capsule dosage form (Label claim: 20 mg of Fluconazole); twenty capsules were weighed, with and without shell, their average weight was determined and the content was finely powdered. Then 50.14 mg of powered content was taken, which was equivalent to 1 mg of Fluconazole and dissolved in 1 ml of mobile phase by stirring for few minutes and the volume was made up to 10 ml by mobile phase. Then 1 ml of that solution was diluted with mobile phase to 10 ml. The final solution was filtered by 0.2-micron membrane

filter by using the instrument called Injection Filter. Then by the help of 1000 µl Micropipette 10, 20, 30, 40, 50, 60, 70, and 80 µl of the filtered solution was taken in small test tubes and diluted up to 1000 µl of each respectively, Which contain 0.062:0.468, 0.125:0.937, 0.25:1.878, 0.5:3.751, 1.0:7.5, 2.0:15, 4.0:30, and 6.0:45 µg/ml of RS and IH respectively.

A 20 µl of the above dilutions were injected one by one to the HPLC with the help of Hammilton Syringe and the amounts of both the drugs were determined. The results are reported in Table 1.

RESULTS & DISCUSSION

The HPLC method was found to be simple, accurate, economic and rapid for routine simultaneous estimation of Fluconazole and itopride hydrochloride in combined capsule dosage form at 266 nm. The regression: 0.9986 and 0.9992, intercept: 41830 and –5256 and slope: 42248 and 14149 were found to be for Fluconazole and itopride hydrochloride respectively. Recovery was in the range of 99.87 – 101%; the value of standard deviation and percentage relative standard deviation were found to be less than 2%; shows the high precision of the developed method (Table 1 and Table 2).

TABLE 1: RESULTS OF ANALYSIS OF CAPSULE FORMULATION

Drug	***Conc. taken (µg)**	***Conc. found (µg)**	**S.D.***	**% RSD***
	0.125	0.125	0.001	0.1
rabeprazole	0.250	0.250	0.003	0.1
sodium	0.500	0.500	0.003	0.1
	1.000	1.001	0.004	0.2

Results are mean of five replicates, S.D.*- standard deviation,
RSD*- relative standard deviation, *Conc.- concentration

TABLE 2: EVALUATION STUDY OF FLUCONAZOLE IN MARKETED FORMULATION

Conc. of RS (µg)	Conc. of RS Found (µg)	% of RS	Found (mg of Label Claim of RS)	Conc. of IH (µg)	Conc. of IH Found (µg)	% of IH	Found (mg of Label Claim of IH)
0.0625	0.062700	100.32	20.57	0.4680	0.467921	99.98	149.98
0.1250	0.125030	100.02	20.01	0.9360	0.935837	99.98	149.95
0.1875	0.187505	100.00	20.00	1.4040	1.404002	100.00	150.00
0.2500	0.250085	100.03	20.01	1.8720	1.872004	100.02	150.00
0.3125	0.312480	99.99	19.99	2.3400	2.339256	99.96	149.91
0.3750	0.375043	100.01	20.01	2.8080	2.808010	100.00	150.00
0.4375	0.437640	100.03	20.01	3.2760	3.275947	99.99	149.96
0.5000	0.500530	100.10	20.01	3.7440	3.743977	100.01	150.01

Results are mean of five replicates

The pH optimization is a key factor in proposed method because Fluconazole is rapidly degrades in acidic medium at low pH HPLC conditions were optimized to obtain, an adequate separation of eluted compounds. Amongst the various mobile phases used, acetonitrile: buffer in (35:65v/v) and the pH was adjusted to 7.0±0.1 by addition of triethylamine was found robust with 1ml/min. flow rate. Mobile phase and flow rate selection was based on peak parameters such as

height, tailing, theoretical plates, capacity factor, run time, resolutions etc. A typical chromatogram of Fluconazole and itopride hydrochloride is shown in Fig.1.

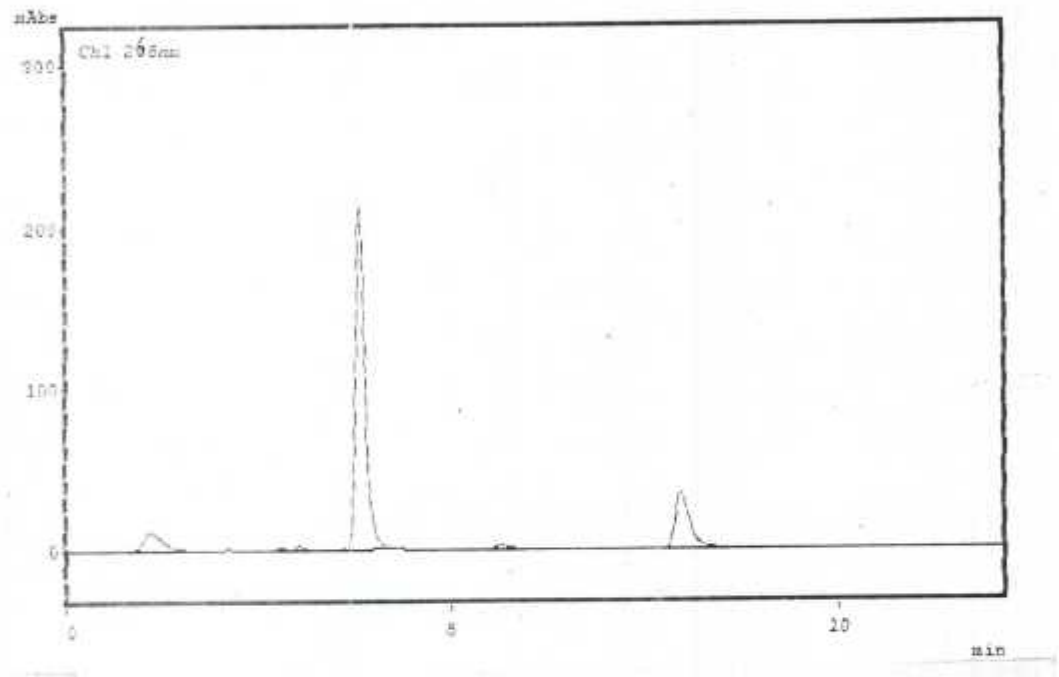


Fig1: Typical chromatogram of Fluconazole in capsule dosage form

The optimum wavelength for detection was 266 nm at which detector response was obtained best. The average retention time for Fluconazole was found to be 8.01 ± 0.05 min.. According to USP XXIV (621) system suitability tests are an integral part of chromatographic method. They are used to verify reproducibility of the chromatographic system. To ascertain its effectiveness system suitability tests were carried out and its results are shown in Table 3.

TABLE 3: RESULTS OF VALIDATION STUDIES

SST* and other parameters	**Results**	
	Fluconazole (RS)	
*Theoretical plates(N)	9208	
*Resolution (Rs)	2.05	
Linearity Range(µg/ml)	0.062 - 6	
Percentage Recovery (%)	99.2- 100.1	
Drug Recovered(20:150mg)	19.97	
*LOD(µg/ml)	0.297	
*LOQ(µg/ml)	1.01	
*Tailing factor	1.27	
*Capacity factor	0.44	
*Retention time(minutes)	8.01	
% RSD	0.13	
Co-rrelation coefficient	0.9982	
Accuracy	99.89-100.3	
Specificity/Selectivity	no interference	
Stability of sample solution	48 hrs.	

SST*- System Suitability Test, *Calculated at 5% Peak height
*LOD- Limit of Detection, *LOQ- Limit of Quantitation

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Date: 20.02.2021

Name of Department: Pharmaceutical Chemistry

Name of College:Kharvel Subharti College of Pharmacy

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

In this project an novel RP-HPLC method for the determination of Ciprofloxacin HCl was developed and validated. Linearity was observed over a concentration range of 10 to 50µg/ml for the standard Ciprofloxacin Hydrochloride. The results obtained indicate that the proposed method is simple, rapid, accurate, and specific. The lower %RSD and lower low value of % CV indicates that there are less variation and there are high precision in the values and method is precise within the acceptance limit of 2%. This method provides adequate sensitivity for routine use and diminishing the time of sampling and chromatographic analysis.

External Support: Yonker foundation

Name of PI: Mr. Vikrant Verma

Signature of PI:

Name of the Department: Pharmaceutical Chemistry

Employee Code of PI:

Name of College: Kharvel Subharti College of Pharmacy

Title of the Project: High Performance Liquid Chromatography (HPLC) Method Development and Validation Indicating Assay for Fluconazole

Duration of the Project: 1Year

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

CNG/LPG GAS DETECTION AND CONTROL SYSTEM USING MOBILE

PROJECT COMPLETION REPORT

Submitted by

Mr. Dharmendra Verma

(Principal Investigator)

Assistant Professor,

Department of ECE

SITE, SVSU

Swatantra Kumar Dubey, Avinash Rathi,
Akshay Kumar Teotia

(Co-Principal Investigators)

2016-17

Index

Summary Sheet

(i) Name of the Principal Investigator : Mr. Dharmendra Verma

(ii) Institution : Subharti Institute of Technology & Engineering

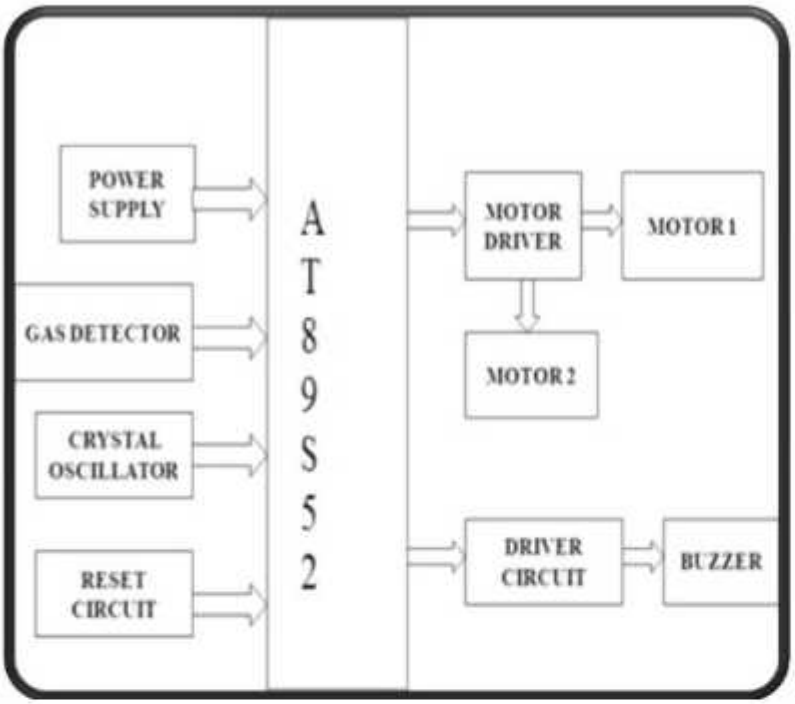
(iii)Project Title: Cng/Lpg Gas Detection And Control System Using Mobile

1. Abstract and Introduction:

Aim of this project is to design a remote home security system based on wireless sensor network using GSM Technology. home security system can be combined by wireless sensor network and GSM Technology gas leakage being a common problem in industries as well as household and can do a lot of destruction if not detected and corrected at the correct time. it can also be life threatening and therefore it is essential to develop a system which can detect this issue.

This project looks forward to connect GSM unit as well as gas detection system to work together and use it for safety purposed against Gas leakage issues.

2. Block Diagram



3. Methodology :

- We need to incorporate our Design as per components and block diagram
- After this we need to apply 9v dc to the Vcc pin of the microcontroller through regulators.
- The reset pin is used to clear all the values of temporary register of microcontroller.
- Crystal oscillator is connected between the 18,19 pins of the microcontroller here the crystal frequency is 11.0529mhz.
- The ULN2003 driver is used as h-bridge and also as a current amplifying ic to increase the power to drive the motor.
- Here we use two side shaft dc motor to wheels with 300rps and the power to the motors is from the ULN2003.
- The microcontroller AT89S52 is used to control the total system by its internal program code.
- When we press the reset button the dc motors starts and travel its predefined area and when Co gas is detected by the sensor then the buzzer is starts buzzing and motors will stop until we press the reset button.

4. Working Description with various sections :

- The working process can be explained when we know about the components used and they are
- AT89S52 microcontroller
- Gas sensor
- ULN2003 driver
- Buzzer
- Dc motors
- Power supply
- A Kiel software is used which is a cross compiler
- A cross compiler is similar to the compilers but we write a program for the target processor (like 8051 and its derivatives) on the host processors (like computer of x86)
- Kiel Software provides us with software development tools for the 8051 family of microcontrollers.
- With the combination of the above we design a system capable to detect gas leakage.

GRADE 'A' ACCREDITED BY NAAC

A Research Proposal

On

EFFECT OF AGING ON RANGE OF MOTION AND FUNCTION OF DOMINANT SHOULDER JOINT IN HEALTHY GERIATRIC POPULATION

Submitted to

Swami VivekanandSubharti University, Meerut

- Name of P.I: Dr. Anshika Singh, Assistant Professor

JyotiraoPhuleSubhartiColllege of Physiotherapy

- Name of Co-P.I: Dr. SumitRaghav, Assistant Professor

Dr. GauravPratapTyagi, Clinical Physiotherapist

JyotiraoPhuleSubhartiColllege of Physiotherapy

INTRODUCTION

No matter how healthy an individual is, as they age their joints will show some changes in mobility, due to changes in the connective tissues. As joint range of movement has a direct effect on posture and movement, this can result in marked alteration of function.Bony changes have a direct effect on joint mobility, influencing the joint surfaces to alter joint mechanics[1]. Subchondral bone (the layer directly below the articular cartilage) undergoes reduction in thickness and density with increased age[2].The shoulder complex shows the greatest changes in the upper limb, whereas no age-associated decline in ROM of the elbow or wrist has been noted[3].

Gender related differences in strength have been reported. More specifically, Hughes et al. have shown that men are stronger than women when controlling for age and weight[4]. The effects of age and dominance, however, are less well known. It has been suggested that, in the normal population, age is negatively associated with isometric shoulder strength and that some shoulder rotational strength measurements differ between dominant and non dominant sides[5]. Studies examining range of motion and its relationships with age, gender and dominance, unfortunately, have reported varied results[6]. Most studies have reported that only some shoulder motions decrease with age however, the specific shoulder ranges of motion affected by age are inconsistent between studies. As for gender-related effects, minimal differences between genders have been described by Murray et al., while Barnes et al. observed greater range of motion in women as compared to men[7]. Measures of function provide a broader view of patient status and are considered more patient centered. Several studies have examined the contribution of self-report questionnaire to disability assessment, or reported on their validity[8]. Unfortunately, very few studies have established normative values for these self-report scales[9]. Furthermore, those that have presented normative values have not included a determination of how self-reported function is related to strength and range of motion[10].

Recently, one of the upper-extremity functional performance tests, the simple shoulder test (SST) has been proposed by Martsen FA, Lippitt SB, et al. This standardized test was developed to assess functional performance for sustained shoulder joint activity. The Simple Shoulder Test (SST) can be used to aid the practitioner in evaluating the success of treatment in terms of shoulder function and specific activity intolerance[11]. It is important to establish a pre-treatment baseline and then periodically monitor the patient's progress and response to treatment. The SST may be given at the beginning of a shoulder treatment regimen and then at intervals throughout treatment, such as at re-examinations. The answers are then compared to assess the patient's response to treatment. The reliability and concurrent validity of the SST have been established in persons with shoulder disorders. It has been shown to discriminate between persons with and without shoulder disorders. Furthermore, the relation between the SST, range of motion and self-reported function has not been established for individuals without shoulder pathology[12].

Hypothesis

Experimental Hypothesis

There will be significant effect of aging on range of motion and function of dominant shoulder joint in healthy geriatric population without upper extremity problem.

Null Hypothesis

There will no significant effect of aging on range of motion and function of dominant shoulder joint in healthy geriatric population without upper extremity problem.

MATERIALS AND METHOD

Study Design:

Single-blind, randomized and observational in nature

Sample selection: According to the inclusion and exclusion criteria, the convenient sample of 330 subjects will be randomly assigned in the study. This study will be conducted in physiotherapy OPD of CSS Hospital, Subharti University Meerut.

Duration of study: 1year

Inclusion Criteria

- Age above 60 yrs
- Both Male and female without any pathology to dominant upper extrimity

Exclusion Criteria

- Any previous pathology of dominant shoulder joint
- Brachial plexus injury
- Any pathology to cervical region
- Axillary cyst on dominant side
- Any previous pathology to elbow and wrist joint on dominant side

Outcome Measures

Simple Shoulder Test

The Simple Shoulder Test was developed by the University of Washington, Department of Orthopedics. It is a self-administered questionnaire designed to document the functional status of a symptomatic shoulder. It consists of 12 "yes" or "no" questions derived from common

shoulder complaints. Each question focuses on shoulder function and a specific activity intolerance.Patients should answer all 12 questions. They should answer them as best they can without any assistance; the instrument is based on patient's evaluation of their shoulder function[13].

Goniometry

It is a technique in which using an instrument named as goniometer purports to measure accurately the movements present in a simple or composite joint. Actually a goniometer is used not so much to measure the exact number of degrees of the movement in a joint as to find out whether there is an increase or a decrease of such movements. In order to do this, it is desirable that a goniometry should provide an easy method of reference to the joint or joints being examined and also provide a fixed base- line point from which to measure any increase or decrease of movement[14].

Test Procedure

Self- report upper extremity function

The self-reported disability scale will be employed to assess shoulder function. It consists of 12 "yes" or "no" questions derived from common shoulder complaints and with respect to time (2 to 3 minutes) to completion. The SST measures functional limitations of the affected shoulder. The SST consists of dichotomous (yes [1] or no [0]) response options. For each question, the patients indicate that they are able or are not able to do the activity. The scores range from 0 (worst) to 12 (best).

Time to complete: 2–3 minutes.

Scoring: Original score: 0 = worst and 12 = best.

Transformed by: (number of "yes" items/number of completed items) × 100 = % "yes" responses.

Score interpretation.

0 = worst and 100 = best function in %

Range of motion

Active flexion, extension, abduction, internal and external rotation range of motion of dominant shoulder joint will be assessed using a universal goniometer (in degrees). Flexion and abduction will be measured in both supine and sitting positions respectively. Extension will be measured in prone lying position. In flexion and extension, center of the humeral head or the lateral aspect of greater tubercle of humerus will be used as axis of rotation. In abduction, the center of the

humeral head near or close to the anterior aspect of acromion process will be used as axis of rotation. External rotation will be measured in both the sitting and supine positions, whereas internal rotation will only measurein supine. For sitting external rotation, subjects will be seated in a straight-backed chair with both feet flat on the floor. Measurements will be taken during active motion with the humerus at 0° of abduction and elbow at 90° of flexion. The olecranon process will be used as the axis of rotation. Supine external and internal rotations will be measured passively with the humerus abducted in the frontal plane to 90° and the elbow will be flexed to 90°. The scapula will be stabilized during internal rotation by the research assistant in order to avoid protraction of the shoulder girdle. The scapula will not be stabilized in external rotation. The movement will topped when the first resistance is felt.

Limitation of study

Research is done only among a particular age group.

Only function and range of motion of dominant shoulder joint are measured.

Variables

Dependent Variables: SST score (in %) and goniometry score (in degrees).

Procedure

After getting their informed consent the subjects were randomly assigned. Subjects for research purpose will be selected according to inclusion and exclusion criteria. According to the goniometry and SST questionnaire, the data of the range of motion and function will be collected and table of selected variants will be prepared and sorting of data will do.

DATA ANALYSIS

All analysis willbe obtained using SPSS version 21.0. Demo graphic data of the patients including range of motion and function of the shoulder joint will be summarized. The dependent variables for the statistical analysis will be SST and goniometry. Paired t-test will be used to find out the mean difference.

Required Instruments

- Couch
- Stool
- Goniometer (Universal full circle)
- Stationary (Pen, Pencil)
- Consent Form
- SST Questionnaire Form

REFERENCES

1. Freemont AJ, Hoyland JA: Morphology, mechanisms and pathology of musculoskeletal ageing. J Pathol 211:252-259, 2007
2. Yamada K, Healey R, Amiel D, et al: Subchondral bone of the human knee joint in aging and osteoarthritis. Osteoarthritis Cartilage 10:360-369, 2002
3. Doriot N, Wang X: Effects of age and gender on maximum voluntary range of motion of the upper body joints. Ergonomics 49:269-281, 2006
4. Hughes RE, Johnson ME, O'Driscoll SW, An KN. Age-related changes in normal isometric shoulder strength. Am J Sports Med. 1999;27:651–657
5. Cahalan TD, Johnson ME, Chao EY. Shoulder strength analysis using the Cybex II isokinetic dynamometer. ClinOrthopRelat Res. 1991:249–257.
6. Barnes CJ, Van Steyn SJ, Fischer RA. The effects of age, sex, and shoulder dominance on range of motion of the shoulder. J Shoulder Elbow Surg. 2001;10:242–246. doi: 10.1067/mse.2001.115270.
7. Murray MP, Gore DR, Gardner GM, Mollinger LA. Shoulder motion and muscle strength of normal men and women in two age groups. ClinOrthopRelat Res. 1985:268–273
8. Getahun TY, MacDermid JC, Patterson SD. Concurrent validity of patient rating scales in assessment of outcome after rotator cuff repair. Journal of Musculoskeletal Research. 2000;4:119–127. doi: 10.1142/S021895770000015X.
9. Hunsaker FG, Cioffi DA, Amadio PC, Wright JG, Caughlin B. The American academy of orthopaedicsurgeons outcomes instruments: normative values from the general population. J Bone Joint Surg Am. 2002;84-A:208–215.
10. Hughes RE, Johnson ME, O'Driscoll SW, An KN. Normative values of agonist-antagonist shoulder strength ratios of adults aged 20 to 78 years. Arch Phys Med Rehabil. 1999;80:1324–1326. doi: 10.1016/S0003-9993(99)90037-0.
11. https://www.researchgate.net/publication/5656975Scoring Systems for the Functional Assessment of the Shoulder [accessed May 5, 2017].
12. Martsen FA, Lippitt SB, et al. Practical Evaluation and Management of the Shoulder, 1994. Used with permission W. B. Saunders Company
13. Martsen FA, Lippitt SB, et al. Practical Evaluation and Management of the Shoulder, 1994. Used with permission W. B. Saunders Company.
14. Bryan o. Scott. A universal goniometer Rheumatology (Oxford) (1965) 8 (4): 138-141.
15. Morrison DS, Frogameni AD, Woodworth P. Non-operative treatment of subacromial impingement syndrome. J Bone Joint Surg Am. 1997;79:732–737.
16. Kim HM, Teefey SA, Zelig A, Galatz LM, Keener JD, Yamaguchi K. Shoulder strength in asymptomatic individuals with intact compared with torn rotator cuff. J Bone Joint Surg Am. 2009;91:289–296. doi: 10.2106/JBJS.H.00219
17. Walker, TM, et al: active mobility of the extremities in older subjects. Phyther 64:919,1984.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 10/12/2017

Head of Department → Neurological Physiotherapy.

Name of Department:

Name of College: Jyotirao Phule Subharti College of Physiotherapy.

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

This study yields several important facts about the relationship among range of motion and self-reported function in the individuals with unaffected shoulders and can serve as a valuable clinical resource for comparison with a patient population. Measurement of 5 active motions and functions of dominant shoulder joint in 330 subjects showed that individuals above 60 years of age differ significantly and showed decline in ROM and self-reported function.

External Support:

Supported by Entice Way Trade Pvt. Ltd.

Name of PI: Anshika Singh.

Name of the Department: Neurological Physiotherapy.

Name of College: Jyotirao Phule Subharti College of Physiotherapy

Signature of the P.I.

Title of the Project: Effect of Aging on ROM and function of dominant Shoulder joint in healthy geriatric population.

Employee Code of PI:

Duration of the Project: 1 year.

Registrar
Swami Vivekanand
Subharti University
MEERUT

A Study To Assess The Effectiveness Of Skill Competency Skill Program In Terms Of Knowledge Regarding Interpretation Of Ecg Among Nurses Working In Icu At Selected Hospitals, Meerut.

Research Proposal Submitted

By

Mrs. Hepsi Natha

Faculty of Nursing

INTRODUCTION

People with life-threatening injuries and illnesses need critical care. Critical care involves close, constant attention by a team of specially-trained health professionals. It usually takes place in an intensive care unit or trauma center. Problems that might need critical care treatment include complications from surgery, accidents, infections and severe breathing problems. Monitors, intravenous tubes, feeding tubes, catheters, ventilators and other equipment are common in critical care units. These can sustain life but can also increase the risk of infection.

Central venous catheters are the devices that can be inserted under the skin into the larger veins. Central venous catheters are small, flexible tubes placed in large veins for people who require frequent access to the bloodstream. They allow medications to be delivered directly into larger veins, are less likely to clot, and can be left in for long periods. Different types of venous access devices are available. They are essentially used to give intra venous medications, obtain venous samples and measurements of central venous pressure. The main advantages of using these devices are administering large volumes of fluids and medications simultaneously quickly and safely.

The central venous catheter may have single or multiple lumens. The central venous catheter is usually inserted in the Jugular vein, Subclavian veins and femoral vein[1]. The prior to insertion of one of these devices get informed consent is routinely obtained from the patient. Complications that can occur during or after placement of a central venous access device includes Cellulitis, Pneumothorax , Catheter related infection,Venous Thrombosis.

Intravascular catheters have become essential devices for the management of critically and chronically ill patients. However, their usage is associated with serious infectious complications resulting in significant morbidity, increased duration of hospitalization, and additional medical costs. Most central venous catheter related infections are preventable, and different measures have been implemented to reduce the risk for catheter-related bloodstream infection including maximal barrier precautions during catheter insertion, catheter site maintenance, and hub handling.

NEED FOR THE STUDY

In India, the use of central venous catheter (CVC) is routine in critically ill patients, in fact 78% of the patients had some form of central venous catheter. Central venous catheterization may cause different complications including infection, haemorrhage and thrombosis. Catheter related bacteraemia is a major and common clinical problem particularly in critically ill patients. Catheter related bacteraemia rates up to 43% (Schulmeister, 1998).

Nurses are responsible for teaching patients about device care and how to troubleshoot complications. Nurses must be aware of factors that can affect learning, such as the patient's age, physical and emotional status, educational level, and current stress level. Failure to provide proper instruction may resort in the omission of vital steps, which may create

problems with any type of device. Educational programs that advance knowledge, skill and competence and determine performance levels for nurses caring for patients with central venous access devices will be effective. Specific policies and procedures, based on the current evidence can be implemented and these can evaluate and review the process (Talbot, 1995).

Approximately, 3.4 million central venous access catheters are placed in patients, in each year. Every year, almost 6000 patients acquire a catheter-related bloodstream infection. Catheter malfunction has an incidence of 10-20%. Catheter fracture is rare (<1%). A total of 41% of central venous catheters (CVC) result in thrombosis of the blood vessel. The major thrombotic complication of CVCs is deep venous thrombosis. These mural thrombi may partially or completely block the blood vessel and involve 12 – 74% of all CVCs (Abedin, 2008). Central line placement in the emergency department is a common practice. The studies have quoted mechanical complication rates in emergency medicine patients of 10- 15%. Central venous access catheter .

A study was conducted over 6 months to determine the rate of infection associated with short-term central venous catheters. The investigators examined 448 catheters in 209 patients. Out of 309 catheters in 158 patients, a total of 5 clinical line infections were found. The infection rates were 1.6% for catheters, 2.8 infections per 1000 catheter days, and 3.2% per patient. The clinical line infection rates found in this study compare favourably with other rates reported .

The use of central venous catheters for vascular access is now common place in a variety of care settings. The nurse must be able to recognize the indications, advantages and disadvantages associated with each device, and to assist the patient in making an informed decision regarding the appropriate device for his or her therapy needs. It is essential that care and maintenance procedures be delivered by those whose knowledge base and experience make them competent care providers with the expertise to initiate appropriate prevention and troubleshooting measures, as well as to evaluate and implement nursing actions related to complications (Drewett, 2000).

As central venous catheters become more widely used in today's healthcare environment, nurses require expert knowledge in relation to central venous catheter maintenance to prevent complications and maximize efforts to optimize the individual's health status. Central venous catheters have begun to be used outside Intensive Care Units (for example, in general wards), and can be associated with high incidences of infection, occlusion and subsequent compromise in patient health. Nurses are responsible for the maintenance of central venous catheter resulting in a need for literature specific to the nursing aspects of management (Gilleece, 1997).

In all India Institute of Medical Sciences, New Delhi, over a 24 month period in a cardiac surgical intensive care unit was used to determine the incidence of infection associated with multi-lumen venous catheters. The influence of various factors including fever, peripheral blood culture, catheter site, catheter usage for monitoring central venous pressure and/ino-

trope therapy on infection rates were statistically evaluated. Bacteraemia occurred in 3% of catheter insertions and catheter colonisation developed in 24%. The data indicate that the inability to identify —risk factorsl for catheter infection emphasise the need to maintain a high index of suspicion (Jansen, 1994).

Registered ICU nurses require specific education and training to gain the knowledge, assessment skills and technical expertise required to manage the care for patients who have central venous access devices and the device-related complications that patients may experience.The nursing role includes educating the patient and the family about the device and its care, administering medications, blood transfusion, providing ongoing central venous access devices management, including the management of complications and the ability to advocate for the patient whenever necessary.

As per the above mentioned need the investigator selected a research study on effectivenessof competency programme on Central Venous Catheter in term of knowledge and practice regarding central venous catheter among I C U nurses at selected hospital at Meerut.

PROBLEM STATEMENT

"A study to evaluate the effectiveness of competency program on central venous catheter care in term of knowledge and practice regarding central venous catheter among I C U nurses at selected hospital at Meerut."

OBJECTIVES:

1) To develop and validate competency program.
2) To assess the pre- test knowledge and practice regarding care of central venous catheter among staff nurses working in I C U at selected hospital at Meerut.
3) To assess the post- test knowledge and practice regarding care of central venous catheter among staff nurse working in I C U.
4) To find out the effectiveness of competency program in improving knowledge and practice regarding central venous catheter care
5) To find out association between post test knowledge score with selected demographic variable.

OPERATIONAL DEFINITION

Evaluate: In this study evaluate refers to a assess the impact of the competency programme on knowledge of the ICU staff nurses regarding central venous catheter care.

Effectiveness: Refer to gain knowledge as determine by significant differencein post test knowledge score of staff nurses who taking care of patient withcentral venous catheter.

Competency Programme: A teaching method to impart knowledge to ICU staff nurses on care of

patient with central venous catheter.

Central venous catheter: Central venous catheter are small, flexible tube placed in large veins like subclavan veins , femoral veins, and jugular veins .

Staff nurses: Staff nurse is the person who take care of patients with central venous catheter.

Nurses: Nurses Reffers to nurses working in intensive care unit.

HYPOTHESIS

H_1 – There will be a significant difference between pre and post test knowledge scores among ICU staff nurses.

H_2 - There will be a significant association between post test knowledge level knowledge score with selected Socio-demographic variables.

ASSUMPTIONS

1. The ICU staff nurses will have some knowledge related central venous catheter care.
2. Competency teaching method is one of the best teaching strategies in imparting knowledge on central venous catheter care among ICU staff nurses.

DELIMITATIONS

1. The study is limited to the selected hospitals at Meerut .
2. The study is limited to the ICU staff nurses only.

CONCEPTUAL FRAMEWORK

Donabedian model will be applied to evaluate the skill competency program regarding central venous catheter in terms of knowledge and practice.

REVIEW OF LITERATURE

Dong-kai Li, and Xiao-ting Wang (july 2017), has conducted a study on Association between elevated central venous pressure and outcomes in critically ill patients. The main objective of the study is to assess the Association between elevated central venous pressure and outcomes in critically ill patients. It was a quantitative research approach with retrospective research design. 500 sample were collected by the using of simple random sampling technique. The main result of the study shown that There were 365 deaths at 28 days after admission. Compared with the lowest quartile of mean central venous pressure [mean (SD) 7.4 (1.9) mmHg], the highest quartile [17.4 (4.1) mmHg] was associated with a 33.6% (95% CI 1.117–1.599) higher adjusted risk of death. Poor secondary outcomes were also associated with higher quartiles of elevated mean central venous pressure. After stratification by mean central venous pressure, elevated duration of central venous pressure above 10 mmHg was significantly higher in the non-survival group.

	N.Caramelo ,at al, (march 2016) has introductedComparative study on central venous pressure evaluation in jugular or subclavian and femoral accesses. The main objectives of this study To compare central venous pressure (CVP) measurements obtained in two different locations (jugular or subclavian veins and femoral veins). It was a quantitative research approach with retrospective research design. Twenty four patients were studied and three patients were excluded. The mean age was 61.2 ± 9.3 years, the ICU stay was 9.8 ± 4.1 days, the APACHE II score was 24.8 ± 5.7, and SAPS II was 52.7 ± 10.4. The mean CVP measured with jugular or subclavian access was 12.1 ± 4.1 mmHg and 12.9 ± 4.2 mmHg at the femoral access. A good correlation between measurements was found with a correlation coefficient and $P > 0.001$. **Harsha V ,at al,** (2011 Oct). Conducted a study on Central venous catheter-related bloodstream infections in the intensive care unit in India. This was a prospective, observational study carried out in the medical intensive care unit (MICU) . A total of 54 patients were taken as the sample by using non probability purposive sampling technique. Result of this study shown that from 54 patients with CVCs studied for bacteriology, 39 (72.22%) catheters showed negative SQCs and also negative blood cultures. A total of 15 (27.77%) catheters were positive on SQC, of which 10 (18.52%) were with catheter-associated infection and four (7.41%) were with catheter-associated bacteremia; the remaining one was a probable catheter-associated bacteremia. **PAULA PARÁS-BR, at-al,** (September 2, 2016) conducted study onComplications of Peripherally Inserted Central Venous Catheters: A Retrospective Cohort Study. This study was conducted in the Day Hospital, Marqués de Valdecilla University Hospital, in Cantabria, a region in northern Spain, between October 2010 and December 2013. Total patient were taken 603 This was a retrospective longitudinal cohort study. All patients were treated according to the same "nursing care" protocol. The incidence rate of complications was two cases per 1000 days of catheter duration. The most relevant complications were infection and thrombosis, both with an incidence of 0.17 cases per 1000 days of the total catheterization period. The total average duration of catheterization was 170 days [SD 6.06]. Additionally to "end of treatment" (48.42%) and "exitus", (22.53%) the most frequent cause of removal was migration (displacement towards the exterior) of the catheter (5.80%). **N. SAFDAR (2002)**, A study conducted to review the risk factors for catheter-related bloodstream infection caused by percutaneously inserted, non cuffed central venous catheters. Strategies for preventing central venous catheter related bloodstream infection are most likely to be effective if guided by an understanding of the risk factors associated with these infections: formal training in central venous catheter insertion and care, use of maximal sterile barriers at insertion, use of chlorhexidine rather than povidone-iodine for cutaneous antisepsis, applying a topical anti-infective cream or ointment or a chlorhexidine-impregnated dressing to the insertion site, and the use of novel catheters with an anti-infective surface or a contamination resistant hub are more effective strategies for prevention of catheter-related

blood stream infections.[12]

Higgins M.et al. (OCT 2008), A study conducted on nurses' knowledge and practice of vascular access infection control in haemodialysis patients in the Republic of Ireland aimed to investigate nurses' knowledge and practice of vascular access infection control among adult haemodialysis patients. A confidential self-completion questionnaire was sent to all 190 qualified nurses employed in nine haemodialysis units to asses the knowledge and behaviour in infection control. Although 92% of respondents reported that policies had been developed by their units and 47% had received infection control education in the previous year.[13]

EggimannP,et-al (AUG 2007) A Study conducted on Prevention of intravascular catheter infection to review recent evidence supporting the guidelines for preventing catheter-related and catheter-associated infections A series of studies has confirmed, over the past few years, that education-based preventive programmes can reduce these infections by one half to two-thirds. The evidence supporting some specific measures has increased for the optimal timing for set replacement, for catheter-site dressing with chlorhexidine-impregnated devices, and for the use of some coated or impregnated intravascular devices. The Catheter-related and associated infections are largely preventable and should not be viewed as an unaffordable tribute to technical medicine. Improvements in existing techniques and new technologies should all be integrated into a structured process of continuous improvement in the quality of care

MATERIAL AND METHODS

RESEARCH DESIGN: Pre-experimental one group pre-test and post-test design

RESEARCH APPROACH: a quantitative research approach will be used

VARIABLES

A concept which can take in different quantitative value is called as variables. The variable under the study are as follows:

Independent variables:competency program on central venous catheter care.
Dependent variables:knowledge and practice regarding central venous catheter.

STUDY SETTING: The study will be conducted at CSSH hospital at Meerut

TARGET POPULATION /SAMPLE: Staff nurses working in ICU.

SAMPLING TECHNIQUE: Non probability purposive sampling technique

SAMPLE SIZE: In this study, the total sample size will be 50 samples.

CRITERIA FOR SELECTION OF SAMPLES

INCLUSION CRITERIA

- Staff nurses working in ICU of selected hospital.
- Staff nurses who are willing to participate in the study.
- Staff nurses with qualification of GNM, B. Sc (N).
- Staff nurses who are present at the time of data collection.

EXCLUSION CRITERIA

- Staff nurses on leave during the period of study.

TOOLS FOR DATA COLLECTION

It deals with the demographic data which consist of age, gender, educational status, years of experience, designation and exposure to central line education programme.

In this study self administered questionnaire related to care of patient with central venous catheter will be used for data collection.

Part 1- Demoghraphic data.

Part-2- structured questioners .

Validity of Tool:-

It refers the measuring instrument accurately measures what it supposed to measure. To determine content validity the constructed tool will given to (8-10) nursing experts in Subharti nursing college and will request to give their opinions and suggestions.

Reliability of Tool:-

Reliability of an instrument is the degree of consistency with which it measures the attribute it is supposed to measure. The reliability of the tool will be elicited by using test-retest method.

PILOT STUDY

Pilot study is a small preliminary investigation of the same general character as major study. The study will be conducted in Lokpriya hospital on 10% of total sample

DATA ANALYSIS METHOD

Analysis and interpretation of data is the most important phase of research process. Analysis is compilation, editing, coding, classification and presentation of data to answer the question. It is a process of organizing and synthesizing data in such a way that research questions can be answered and hypothesis tested.

In this present study the collected data will be tabulated, organized and analyzed by using descriptive and inferential statistics.

Demographic data will be analyze by using frequency and percentage distribution.

TIME AND DURATION OF THE STUDY-

Time and duration will be according to the need of course of work.

DOES THE STUDY REQIRE ANY INTERVENTION OR INVESTIGATIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

No , the study does not require any intervention or Investigations to be conducted on patients or other humans or animals.

ETHICAL CLEARENCE

- Permission will be obtained from the research ethical committee.
- Informed consent will be taken from the CSSH hospital.
- Informed consent will be taken from the sample(staff nurses)

COST INVOLVED (APROX IN RS) –

Approximately this study requires 5000 rupees for paper work, data collection procedure, other requirements etc.

WHO WILL BEAR THE COST OF THE REQUIREMENT

Researcher will bear the cost of this study.

REFRENCES :

BOOKS

1. Black M Joyce, Jane HokansonHawks,Medical Surgical Nursing',7th edition, St.Louis: Elsevier publishers,2007,1535-40
2. Lewis, Heitkemper, Dirksen. Medical Surgical nursing. 6th ed. St.Louis: Mosby publishers; 2004. p. 929-33.
3. Potter A P ,Perry G A ,Fundamentals of nursing ,6th revised edition ,New Delhi,Elsevier,2005,pp 1427,28,31
4. Suzanne C Smeltzer, Brenda G Bare. Text book of medical surgical nursing,10th edition, Philadelphia, Lippincott Wilkin,2004,935-937

JOURNALS

1. PisulkarGajanan ,MahendraGudhe, Khan Soheal.Global journal of research analysis2016 Sep ;Vol.5(9):321-322.
2. Kathryn A.Lavall, Joanne F.Costello.Assessment of the public's knowledge of venous catheterization. .JVascNurs. 2015 Jun.
3. Leonardo Lorente 2005, Central venous catheter-related infection in a prospective and observational study of 2,595 catheters.https://doi.org/10.1186/cc3824
4. Dong kai li et al.2017. Association between elevated central venous pressure and outcomes in critically ill patients.PMC journal https:// www.ncbi.nlm.nih.gov,

NET DATABASE

5. disesequtotes https:// www.successories .com

6. Care of Your Central Venous Catheter - UPMC. ***www.upmc.com/patients-visitors/education/.../care-your-centeral-venous-catheter.asp***
7. www.endovascularsurgery.com. patients
8. Kline AM. Pediatric catheter-related bloodstream infections: latest strategies to decrease risk. AACN Clin Issues. 2005 Apr-Jun;16(2):185-98.
9. CVC 2005-2018 https://webmed.com
10. A.H,Akmal and A Mariam,(2007), incidence of comlicatioms of CVC at ICU,NCBI annals for thoracic medicine.PMID 19727348
11. Smith PL,et al. 1995 central venouscatheter infection rate. Pubmed. PMID 7562225.
12. N safdar-2002, a review of risk factor for catheter related blood stream infection NCBI, hhhps://www.ncbi.nlm.nih.gov.pubmed
13. Higgins M et al, 2008,nurses knowledge and practice of vascular access infection . Pubmed lab, article 34(2).

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 29.09.2019

Head of Department

Name of department: Medical Surgical Nursing

Name of College:PannaDhaiMaaSubharti Nursing College

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

The study revealed that the mean post-test knowledge score of staff nurses in experimental group (24.23) is significantly higher than then mean post test knowledge score of control group (9.13). The mean difference between the post test knowledge score of both the group was found to be (4.8). Then unpaired't' value (13.14) and the df (58) was found to be statically significant at 0.05 level of significance.

The study concluded that nurses working in ICU were having deficit knowledge regarding ECG interpretation and competency skilled programme was found to be an effective method to improve the knowledge of staff nurse.

External Support: Entireway Tradelink Pvt. Ltd. Supported the project

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Name of PI: Ms. HepsiNatha

Name of the Department: Medical Surgical Nursing

Name of College:PannaDhaiMaaSubharti Nursing College

Title of the Project: Effectiveness of competency skilled programme in terms of knowledge and practice regarding interpretation of ECG among nurses working in ICU at selected hospitals, Meerut

Hepsi (Hepsi Natha)

Signature of the P.I.

Duration of the Project:55 weeks

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING
SWAMI VIVEKANAND SUBHARTI UNIVERSITY

"Soil Stabilization Using Waste Crumb Rubber"

REPORT

By

Er. Rohit Puzara

(Principal Investigator)

Assistant Professor,
Department of CE, SITE,
SVSU

Subharti Institute of Technology & Engineering
Swami Vivekanand Subharti University,
Subhartipuram, NH-58, Delhi-Haridwar Bypass Road,
Meerut-250005

Summary Sheet

1. **Name of the Principal Investigator:** Er. Rohit Puzara

Phone No: 8630490351 Email: rohitpujara.11@gmail.com

2. **Institution :** Subharti Institute of Technology & Engineering
3. **Project Title :** "Soil Stabilization Using Waste Crumb Rubber"
4. **Introduction :**

Soil reinforcement is one of the geotechnical branches which has been reinforcing and improving the soil engineering specifications and mechanical properties like strength, plasticity, bearing capacity and elasticity modules by the use of new technologies and suitable materials. Soil reinforcement is a reliable and effective method to improve the soil strength and stabilization which has always been the human interest.

At the present times, the elements which are used in soil reinforcement are made of metal or polymeric materials or even herbal like jute and Coir fiber geotextiles. Friction phenomena between the soil and its reinforcement materials play an important role in mechanism of action and behavior in soil.

India's waste tyres (Rubber) account for about 6-7% of the global total. With the local tyre industry growing at 12% per annum, waste volumes are rising. India has been recycling and reusing waste tyres for four decades, although it is estimated that 60% are disposed of through illegal dumping. Despite this, India is the second largest producer of reclaimed rubber after China. In 2012, India produced 90,000 metric tonnes of reclaimed rubber from waste tyres.

5. **Objectives of the study**

- To study the compaction parameter i.e. OMC and MDD of soil treated with different proportions of rubber and soil combination.
- To study the unconfined compressive strength characteristics of soil treated with different proportions of tyre rubber and soil combination.
- To determine the California Bearing Ratio (CBR) values with different percentage of rubber
- Analysis and interpretation of result.

6. Methodology:

In this phase of study a detailed investigation of the compaction characterstics of the parent soil and the blended sample containing different crumb rubber percentage, in order to obtain the optimum moisture containt and maximum dry densities. The optimum moisture containt thus obtained was used in prepairing samples for Unconfined Compressive Strength test and CBR test. This test confirms to IS:2720-1980.

7. Major Outcomes:-

Following conclusions can be drawn from the results obtained through experimental investigation.

- It has been observed that the OMC and maximum dry density of soil decrease with increase in rubber. Since it does not absorb water, OMC decrease for the mix.
- As the compaction was carried out immediately after mixing and rubber is inert material which does not react with soil , so no chemical reaction is expected in this process of hydration. The reduction in maximum dry density with increasing rubber content might be the result of the replacement of soil particles by rubber particle in a given volume, they partially filled the voids between the soil particles and prevented them from coming into a closer state of packing, and their lower specific gravity resulted in less density of soil rubber mix.
- Unconfined compressive strength of virgin soil increased significantly when mixed with rubber at different percentage.
- The study shows an improvement in soil sample when mixed with rubber buffing causes change in the strength. There is a particular ratio at which maximum benefit can be obtained. From UCS test the optimum value for rubber buffing is found to be 10% and corresponding increase in strength was recorded as 44.82% .
- CBR tests have shown increasing trend till 10% of rubber buffing and decrease as the percentage of rubber was increased to 12% and 14% . the CBR value at 10% for soaked condition is 3.5 which is highest and also higher to the conrol CBR (3.15) without rubber. Therefore it is concluded that addition of rubber in soil has the characteristics of of increased strength values, and also solve the problem associated with disposal of waste rubber tyre to some extent which otherwise cause environmental degradation.

- The application of this will be for both rural and urban roads with moderate speed of vehicle.

8. Scope of further studies:

- Improving properties of soil has become a matter of paramount importance today. Here an effort has been made to study the effect of tyre buffing in strength of soil. There are many alternative available for doing the same.
- Here are some suggestion made for further research in the area.
- The entyre exercise may be done on various soils for arriving at conclusions having wider applications.
- Other materials such as cement, rish husk ash, may be mixed in the mixture of rubber and soil for further reasearch.
- Other geotechnical parameters such as hydraulic conductivity , consolidation parameters can be investigated
- Durability aspects of rubber treated soil like drying and wetting , freezing and thawing action and response to various chemicals like alkalis, chlorides, sulphides may also be investigated.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 18/07/2018

Head of Department

Name of Department: Civil Engineering

Name of College: S.I.T.E

Findings of the project: (Max-100 words): The application of recycled tire waste has a positive effect on the engineering properties of the poorly graded sand. Crumb rubber consist of the potential to improve the strength of treated sand. The shear strength of crumb rubber and sand mixture is greater than the sand alone. The dry density of the sand decreases initially but at 20% it is maximum. Hence it is used in lightweight backfill material.

External Support: yes, Scientific and Social Service Research Foundation

Name of PI: Rohit Purohit

Name of the Department: Civil Engineering

Name of College: S.I.T.E

Title of the Project: Soil Stabilization using Waste Crumb Rubber.

Duration of the Project: 01 year

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

A Study To Evaluate The Effectiveness Of Skill Competency Program On Central Venous Catheter In Terms Of Knowledge And Practice Among ICU Nurses At Selected Hospital At Meerut

Research Proposal Submitted

By

Mrs. Hepsi Natha

Faculty of Nursing

Introduction

"Don't learn safety by accident"

-Painting

The health care providers and patients face multiple challenges, where new treatment modalities and technology interfere with the continuing effort to strive forquality care and expected outcomes. Competence and cost effectiveness must go hand inhand, to satisfy the patients and to improve the quality of care. While encouraging therenovations, it makes a sense; their variant effects need to be screened.

A normal healthy person also will suffer from any kind of serious illness due to improper diet, sedentary life style and poor personal habits. People with life-threatening injuries and illnesses need critical care and It's usually takes place in an intensive care.

Patient safety has become a major focus of attention by health care consumers, providers of care, and administrators of health care institutions. *21st Century* was the impetus for debate and in actions to improve the safety of health care environments. This report was given information that health care harms patients too frequently and routinely fails to deliver its potential benefits.Often, the definitions of medical errors and approaches to resolving patient safety issues differ among nurses, physicians, administrators, and other health care providers.

Care managementis enabling, support, and coordinates patient care throughout the continuum of health care services. Care management takes place in many different settings and many quality improvement tools are available to providers for care management. The three evidence-based tools addressed in this chapter are clinical algorithm, practice guideline, and protocol.

A protocolis a common tool in research studies. Protocols are more directive and rigid than guidelines, and providers are not supposed to vary from a protocol. Patients are screened carefully for specific entry criteria before being started on a protocol. Protocols are helpful when built-in *alerts* signal the provider to potentially serious problems.

When an injury or inappropriate care occurs, it is crucial that health care professionals promptly give an explanation of how the injury or mistake occurred and the short- or long-term effects on the patient and family. They should be informed that the factors involved in the injury will be investigated so that steps can be taken to reduce or prevent the likelihood of similar injury to other patients. Medical and surgical intensive care units segregated the most critically ill patients in locations where they could be cared for by nurses with specialized knowledge in those areas of care. In the hospital units established for patients needing such specialized care, nurses assumed many functions

and responsibilities formerly reserved for physicians, and they assumed a new authority by virtue of their knowledge and expertise.

Researchers have studied critical care nurses to better understand their clinical judgment and interventions. They identified two major categories of thought and action and nine categories of practice that illustrate clinical judgment and the clinical knowledge development of critical care nurses.

When we send the critical patient to any scan like CT scan, MRI, X-ray and other, there is a need of proper transportation even when the patient on sedation via transportation needsanaesthesiologist and registered nurse with in assistance.

Nurses contribution to reduce transport related complications play foremost role.

The critical conditions of the patient warrant the support of advanced equipments. ICUStaff has a crucial role in developing transport standards and protocols to reduce thetransport related events. Implementation of transport checklist plays a vital role inenhancing the patient safety and to reduce the transport related complications.

7.1 BACKGROUND OF THE STUDY

Transport mainly comprises of accompanying personnel, selection of appropriate equipment and patient physiological monitoring. The complications acts like a scenario. Complications proceeds from a simple event to complex event. This results in prolonged length of stay. Most episodes of complications are developed from failure in oxygen supply, disconnection of inotroph, over sedation, ignorance of finding and so on. Management of critical ill patient require establishment of database, identification of actual nursing diagnosis and collaborative problem. The assessment process for the critical patient different from other patient.

As per the Indian society of Critical Care Medicine guidelines (2007) intrahospitaltransport involves protocol development and written procedures, the decision to

transport, identifying high risk patients, preparation of the patient, accompanying

personnel, equipment, drugs, prêtransportation coordination& communication between the

accompanying personnel, equipment, drugs and monitoring, care during transport and care at destination.

When the patient is transferring for the first time after prolonged bed rest, for surgery, spinal cord trauma require supervision by professionals nurses. A poorly organized and hastily done patient transfer can significantly contribute to morbidity and mortality.This article reviews the various guidelines for an effective intra-hospital transfer and current scenario of patient transfer in developing countries like India.

7.2 NEED FOR STUDY

"You are the key to your patient safety"

Indian ICUs range from state of the art ICUs; which can compete with the best inthe world; to basic ICUs. It is a difficult task to develop guidelines for such diverserequirements. There is not much Indian data available due to scarcity of evidence inmany areas. (ISCCM Guidelines). Transport protocol should include the assessment ofrisk and benefits of moving the patient, minimum equipment required for monitoring andlife support, trained accompanying personnel, transport checklist and a register fordocumentation of adverse events.

The reported global incidence rate range from 6% to 70% (Waydhas 1999).There is no Indian data published on transport of critically ill patients. (ISCCMGuidelines). Equipment and monitoring related complications have been reported fromrange of 10-34% during transport (Wallen, et.al, 1995).

Successful intra-hospitaltransport directly depends on the planning and organization of the multidisciplinary teamas well as appropriate monitoring and intervention during transport.Knight, et.al, (2015) described the potential complications caused due tointrahospital transport of critically ill patients are pulmonary complications,hemodynamic complications, nosocomial infection, isolated complications duringtransport of patients with spinal injury and brain injury, patients with hypoglycaemia andhyperglycemias, patients in acid-base disturbances which are considered to be morecautious.

Transport of critically injured patients are at risk for complication duringtransport, mainly for orthopaedic and neurosurgical patients because various traction,monitoring and stabilization devices must be perfectly aligned and secured or elsepatient's functional outcomes may be affected. Spinal injury is the most critical. Minorpatient manipulation without proper precautions may result in severe injury. (Conradet.al, 2012)

Complications that occurred during transport are either related to nursing/ medicalerrors/ worsening of patients physiological condition (Harish, et.al, 2016). Nursesawareness regarding transport related complication has to be updated and even in manyof the Indian hospitals the usage of transport protocol is an upcoming task. The intrahospitaltransport of critically ill patients comprises of multidisciplinary actions. whichcannot be displayed as like a protocol in the words. To prevent the transport relatedcomplications a checklist which comprises of all the transport phases makes the standardof care as well as promote quality of care (Shields et.al, 2015).

Nurses are a constant presence at the bedside and regularly interact with physicians, pharmacists, families, and all other members of the health care team. Of all the members of the health care team, nurses therefore play a critically important role in

ensuring patient safety during transportation and performing countless other tasks to ensure patients receive high-quality care. Hence, the researcher felt the need to conduct this study regarding patient transportation safety protocol to educate ICU nurses.

7.3 STATEMENT OF THE PROBLEM

A study to evaluate the effectiveness of Structured Teaching program on patient safety protocol for critical care patients in terms of knowledge among ICUs nurses at selected hospitals in Meerut

7.4 OBJECTIVES OF THE STUDY

1. To prepare and validate the structured teaching program on safety protocol for critical care patient
2. To evaluate the pre test and post test knowledge score on safety protocol for critical care patient before and after administration of structured teaching program among ICUs nurses in experimental group
3. To compare the post test knowledge score on safety protocol for critical care patient between experimental and control group among ICUs nurses
4. To find the association between post test knowledge score with their selected demographic variable in experimental & control groups

7.5 OPERATIONAL DEFINITION

EVALUATE: To judge or calculate the quality, importance, amount, or value of something.

–oxford dictionary

In this study evaluate refers to a assess the impact of the competency program on knowledge of the ICU nurses regarding patient transportation safety protocol

EFFECTIVENESS: The degree to which something is successful in producing a desired result

In the study it refers to gain in knowledge and practice skills as determined by significant difference in pre-test and post-test knowledge and practice scores regarding patient transportation safety protocol among nurses working in ICUs

STRUCTURED TEACHING PROGRAM:

In this study it refers toa systematic teaching method to impart knowledgeto ICU nurses regarding patient transportation safety protocol.

STAFF NURSES: a registered nurse working in various ICUs

PATIENT SAFETY PROTOCOL: in this study it refers to protect the patient from environmental hazards injury while transfer the patient from one place to another place

7.6 **RESEARCH HYPOTHESES (0.05 level of significance)**

H_1 – There is a significant difference between knowledge score in experimental and control group.

H_2 - There will be a significant relationship between post test knowledge score in experimental group as compare to control group.

H3- there will be significant association between post test knowledge score with selected socio demographic variables

7.7 **ASSUMPTION**

1. The ICUs nurses will have some knowledge related patient transportation safety protocol
2. Structured teaching program is one of the best teaching strategies in imparting knowledge of patient transportation safety protocol among ICUs nurses.

7.8 **DELIMITATION**

1. The study is limited to the selected hospitals at Meerut.
2. The study is limited to the ICU nurses only.

7.9 CONCEPTUAL FRAME WORK

Wiedenbach's theory

8 REVIEW OF LITERATURE

Despoina G. Alamanou and Hero Brokalaki (2014) was conducted study on intra hospital transports are performed daily in hospitals. They saw various risks to patients, which could lead to life threatening complications. Nursing care contribute to achieve the above, although the role of the nurse has never been studied, separately. The aim of this study was to analyze the risk factors for complications that usually occur during intra hospital transports. Describe the role of nursing in intra hospital transport policies. Method and Material were used to search electronic databases Medline, Cinahl, Cochrane Library and Scirus, for the period 1980-2013, on both original articles and reviews, selecting and analyzing the articles related to the issue and Results shows about risk factors for complications during intra hospital transport are related to patient's illness severity, handling during transport, inadequate equipment, lack of highly trained staff, inadequate monitoring and ineffective communication among staff during transport. Nurses can create an intra hospital transport protocol, based on published guidelines, train the staff on it, assess and stabilize patient's health condition prior to transport and improve the overall quality of care for transported patients. In the conclusion of research the risks posed by intra hospital transports for critically ill patients can be minimized or even prevented by a well-designed transport protocol with

the effective participation of the nurse.

Marie Haggstrom and Britt Backstrom(2014) was conducted study on an Organize and performing patient transfers in the pattern of care is part of the work of nurses and other staff. Discharge practices is needed in order to ultimate patients' transfers from high technological intensive care units (ICU) to general wards. Aim of the study was to describe, as experienced by intensive care and general ward staff, what strategies could be used when organizing patient's care before, during, and after transfer from intensive care. In the study researcher used method as Interviews of 15 participants, audio-taped, transcribed verbatim, and analyzed using qualitative content analysis.

The results showed that the categories secure, encourage, and collaborate are strategies used in the three phases of the ICU transitional care process. The main category; a safe, interactive rehabilitation process, illustrated how all strategies were characterized by an intention to create and maintain safety during the process. In Conclusions findings highlight that ICU transitional care implies critical care rehabilitation. Discharge procedures need to be safe and structured and involve collaboration, encouraging support, optimal timing, early mobilization, and a multidiscipline approach.

Parmentier-Decrucq E' , Poissy J, Favory R, Nseir S, Onimus T, Guerry MJ, Durocher A, Mathieu D (2013) were conducts study on Adverse events during intra hospital transport of critically ill patients in that Transport of critically ill patients for diagnostic or therapeutic procedures is at risk of complications. Adverse events during transport are common and may have significant consequences for the patient. The objective of the study was to collect prospectively adverse events that occurred during intra hospital transports of critically ill patients and to determine their risk factors. In this study method was using prospective, observational study of intra hospital transport of consecutively admitted patients with mechanical ventilation was conducted in a 38-bed intensive care unit and the result was this study 262 transports observed (184 patients), 120 (45.8%) were associated with adverse events. In risk factors were ventilation with positive end-expiratory pressure >6 cmH2O, sedation before transport, and fluid loading for intra hospital transports. Within these intra hospital transports with adverse events, 68 (26% of all intra hospital transports) were associated with an adverse event affecting the patient. Identified risk factors were: positive end-expiratory pressure >6 cmH2O, and treatment modification before transport. In 44 cases (16.8% of all intra hospital transports), adverse event was considered serious for the patient. In our study, adverse events did not statistically increase ventilator-associated pneumonia, time spent on mechanical ventilation, or length of stay in the intensive care unit. In this study conclusion was confirms that the intra hospital transports of critically ill patients leads to a significant number of adverse events. Although in our study adverse events have not had major consequences on the patient stay, efforts should be made to decrease their incidence.

Ayako Okuyamaand KartinicMartowirono and Bart Bijnen (2011) conducted

study on patient safety competencies of healthcare professionals: a systematic review is Patient safety training of healthcare professionals is a new area of education. aims of the study to identify the available assessment tools for different patient safety domains and evaluate them according to Miller's four competency levels. In this study researcher used method searched PubMed, MEDLINE, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, psycINFO and the Education Resource Information Center (ERIC) from the start of each database to December 2010 for English-language articles that evaluated or described tools for the assessment of the safety competencies of individual medical and/or nursing professionals. For the results in this study 34 assessment tools in 48 studies were identified: 20 tools for medical professionals, nine tools for nursing professionals, and five tools for both medical and nursing professionals. Most of the tools that aimed at the higher levels assessed the skills of working in teams (17 tools), risk management (15 tools), and communication (11 tools). Internal structure (reliability, 22 tools) and content validity (14 tools) when described were found to be moderate. There are conclusion many tools designed to assess the safety competencies of healthcare professionals. However, a reliable and valid toolbox for summative testing that covers all patient safety.

Fanara B[1], Manzon C, Barbot O, Desmettre T, Capellier G. (2010) was conducted study Recommendations for the intra-hospital transport of critically ill patients. In this study was to provide Intensive Care Units with a set of practical procedures (check-lists) for managing critically-ill patients in order to avoid complications in during intra-hospital transport . in this method digital research was carried out via the MEDLINE, EMBASE, CINAHL and HEALTHSTAR databases using the following key words: transferring, transport, intra-hospital, and critically ill patient. Result for this review focuses on the analysis and intra hospital transportation -related risks, the associated adverse events, and their nature and incidence. A check-list used for justified. For the conclusion improvements in intra hospital transportation practices, significant risks are still involved. A critically ill patient, prepared and accompanied by an inexperienced team, is a risky combination. The development of adapted equipment and the widespread use of check-lists and proper training program would increase the safety of intra hospital transportation and reduce the risks in the long-term

9. MATERIALS AND METHOD OF THE STUDY

9.1 RESEARCH APPROACH

Quantitative research approach

RESEARCH DESIGN: Quasi experimental design

SCHEMATIC REPRESENTATION OF THE STUDY

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

Keys:

O_1 :- Pre test (knowledge questionnaire to assess level of knowledge regarding patient safety protocol)

X :-Structured teaching program regarding patient safety protocol

O_2 :- Post test (knowledge questionnaire to assess level of knowledge regarding patient safety protocol)

9.2 VARIABLES

INDEPENDENT VARIABLE

Structured teachingprogramme

DEPENDENT VARIABLE

Level of knowledge

9.3 SETTING OF THE STUDY

The study will be conducted at CSSH hospital at Meerut

9.4 POPULATION

ICUs Nurse

SAMPLE

ICUs nurse working in CSS Hospital Meerut.

9.5 SAMPLING SIZE

In this study, the total sample size will be 60 samples.

9.6 SAMPLPING TECHNIQUE

In this study the non-probability purposive sampling technique will be used.

9.7 CRITERIA FOR SAMPLESELECTION

INCLUSION CRITERIA

- Nurses working in ICU of selected hospital.
- Nurses who are willing to participate in the study.
- Nurses with qualification of GNM, B. Sc (N), Post B.Sc(N).
- Nurses who are present at the time of data collection.

EXCLUSION CRITERIA

- Nurses on leave during the period of study.
- Nurses who have attended conference or workshop regarding patient transportation safety protocol

9.8 **TOOLS FOR DATA COLLECTION**

It deals with the demographic data which consist of age, gender, educational status, and years of experience and source of information.

In this study self administered questionnaire related to care of patient while patient transportation will be used for data collection.

Part 1- Demographic data.

Part-2- structured questioners.

Validity of Tool:-

It refers the measuring instrument accurately measures what it supposed to measure. To determine content validity the constructed tool will be given to (7) nursing

experts & (3) medical experts outside the Subharti nursing college and will request to give their opinions and suggestions.

Reliability of Tool:-

Reliability of an instrument is the degree of consistency with which it measures the attribute it is supposed to measure. The reliability of the tool will be elicited by using test-retest method.

9.9 **PILOT STUDY**

Pilot study is a small preliminary investigation of the same general character as major study. The study will be conducted in Chhatrpati Shivaji Subharti Hospital on 90%& in Lokpriya hospital 10% of total sample

9.10 **METHOD OF DATA ANALYSIS**

Descriptive statistics

- Frequency and percentage distribution will be used to analyze the demographic data of student.
- Mean percentage and standard deviation will be used to assess the level of knowledge and practice of student.

Inferential statistics

- Paired 't' test will be used to assess the effectiveness of skill competencyprogramme.
- Chi square test will be used to find the association between post-test knowledge and practice with demographic variables.

Analyzed data will be presented in the form of tables, graphs and diagrams based on the findings.

9.1 **TIME AND DURATION OF THE STUDY**

The proposed study duration is 30 days.

9.2 **HAS THE ETHICAL CLEARENCE BEEN OBTAINED YOUR INSTITUTION IN CASE OF 7.3?**

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.

REFRENCES :

BOOKS

1. Linda D. Urden, A Textbook of Critical Care Nursing, Publication *Elsevier,* Edition 2014, Pages: 01-11
2. Brunner &Suddarth's, textbook of medical-surgical nursing, publication Wolters Kluwer Health / Lippincott Williams & Wilkins, edition 12th
3. Chintamani, A Text Book For Medical Surgical Nursing, Edition -2nd Published By Elsevier
4. Phipps', A textbook of medical surgical nursing, Edition-8th, Published By Elsevier Pages: 179-198

5. Potter & Perry, A textbook of basic nursing, Published By Elsevier Pages: 671-687

JOURNALS:

1. Health Science Journal, Intra hospital Transport Policies: The Contribution Of The Nurse,2014

NET DATABASE:

1. Despoina G. Alamanou1 , Hero Brokalaki ; Intra hospital Transport Policies: The Contribution Of The Nurse, Year: 2014, Vol: 08
(http://www.hsj.gr/medicine/intrahospital-transport-policies-the-contribution-of-the-nurse.pdf)

2. Parmentier-Decrucq E, Poissy J, Favory R, Nseir S, Onimus T, GuerryMj, *Et Al.* Adverse Events During Intra Hospital Transport Of Critically Ill Patients: Incidence And Risk Factors. Ann Intensive Care 2013;3:10
(https://www.ncbi.nlm.nih.gov/pubmed/23587445)

3. Fanara B, Manzon C, Barbot O, Desmettre T, Capellier G. Recommendations For The Intra Hospital Transport Of Critically Ill Patients. Critical Care 2010; (3)14: 87.
(https://www.ncbi.nlm.nih.gov/pubmed/20470381)

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date:30.09.2019

Head of Department

Name of department: Medical Surgical Nursing

Name of College:PannaDhaiMaaSubharti Nursing College

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

The mean pre-test knowledge score of the experimental group was (13) and the standard deviation was (2.12) against the maximum score (25). The range of obtained score was between (1-8) indicating there was the knowledge deficit exists regarding Central venous catheter care. The mean post-test knowledge score of the experimental group was (20.6) and standard deviation (2.39) against the maximum score of (25). There was an increase of knowledge regarding Central venous catheter care among staff nurses working in ICU. The study implied that the competency program was effective in enhancing the knowledge score of staff nurses working in ICU in the experimental group regarding Central venous catheter care.

External Support: Entrieway Travellers Pvt Ltd.

Name of PI: Ms. HepsiNatha

Name of the Department: Medical Surgical Nursing

Name of College: PannaDhaiMaaSubharti Nursing College

Title of the Project:A Study to evaluate the effectiveness of competency programme on central venous catheter care in terms of knowledge and practice among ICU nurses at selected hospitals, Meerut

Hepsi (Hepsi Natha)

Signature of the P.I.

Duration of the Project:54 weeks

Employee Code of PI

Registrar
Swami Vivekanand
Subharti University
MEERUT

GRADE 'A' ACCREDITED BY NAAC

A Research Proposal

On

Role of Vestibular Adaptation Exercises on Motion Sickness

Submitted to

Swami VivekanandSubharti University, Meerut

Name of P.I: Dr. Anshika Singh, Assistant Professor

JyotiraoPhuleSubharti College of Physiotherapy

Name of Co-P.I: Dr. Sanjai Kumar, Associate Professor

JyotiraoPhuleSubharti College of Physiotherapy

Introduction

Motion sickness is also known as travel sickness, is a condition in which a disagreement exists between visually perceived movement and the vestibular system's sense of movement. Depending on the cause it can also be referred to as car sickness, bus sickness or train sickness [1]. Dizziness, fatigue, and nausea are the most common symptoms of motion sickness [2]. If the motion causing nausea is not resolved, the sufferer will frequently vomit. Unlike ordinary sickness, vomiting in motion sickness tends not to relieve the nausea. About 33% of people are susceptible to motion sickness even in mild circumstances such as being on a boat in calm water, although nearly 66% of people are susceptible in more conditions [3]. Individuals and animals without a functional vestibular system are immune to motion sickness [4]. The restrictive definition (e.g., onset of vomiting, nausea) and lack of clear diagnostic testing may result in false negative identification and an underestimation of the incidence of motion sickness [5]. If current theories of motion sickness are correct then the principles of habituation that have been applied with varying success to reduce or prevent motion sickness in pilots and astronauts [6] might be applicable to the development of evaluation and treatment methods for individuals with motion sickness that interferes with daily function. Motion is sensed by the brain through three different pathways of the nervous system that send signals coming from the inner ear (sensing motion, acceleration, and gravity), the eyes (vision), and the deeper tissues of the body surface (proprioceptors). When the body is moved intentionally, for example, when we walk, the input from all three pathways is coordinated by our brain. When there is unintentional movement of the body, as occurs during motion when driving in a car, the brain is not coordinating the input, and there is thought to be incoordination or conflict aamong the inputs from thethree pathways. It is hypothesized that the conflict among the inputs is responsible for motion sickness. Many of the drugs that are used to treat motion sickness act by influencing or affecting the levels of these compounds within the brain. Without the motion-sensing organs of the inner ear, motion sickness does not occur, suggesting that the inner ear is critical for the development of motion sickness. Visual input seems to be of lesser importance, since blind people can develop motion sickness. Motion sickness is more likely to occur with complex types of movement, especially movement that is slow or involves two different directions (for example, vertical and horizontal) at the same time. Sudden jerky movements tend to be worse for provoking motion sickness than slower smooth ones, because they disrupt the fluid balance more. Motion sickness is greatest for vertical sinusoidal motion in the frequency range of 0.05- 0.08 Hz and is maximal at 0.167 Hz [7]. The most common hypothesis for the cause of motion sickness is that it functions as a defense mechanism against neurotoxins [8].

Vestibular Rehablitaton Therapy

Vestibular Rehabilitation Therapy (VRT) is a form of physical therapy that uses specialized exercises that result in gaze and gait stabilization. Most VRT exercises involve head movement, and head movements are essential in stimulating and retraining the vestibular system. Vestibular

rehabilitation therapy has been a highly effective modality for most adults and children with disorder of the vestibular or central balance system. The basis for the success of VRT is the use of existing neural mechanisms in the human brain for adaptation, plasticity and compensation. The extent of vestibular compensation and adaptation is closely related to the direction, duration, frequency, magnitude and nature of the retraining stimulus. Our inner ear controls our sense of balance. The delicate bones and organs of the inner ear are known as the vestibular system. If something goes wrong with this system due to illness or injury, we may find our self dizzy, nauseous and unable to balance properly. Vestibular adaptation exercises strive to train our body to compensate and regain our sense of balance. A trained therapist will work to learn exercises to compensate for particular condition [9]

Vestibular System

The vestibular system is the system of balance. It is also involved in the function of maintaining visual fixation during head movement and in maintainingposture and lower muscular control. An understanding of the anatomy and physiology of the normal vestibular system is the first step in being able to understand the symptoms, physical exam findings, and testing results during disease states. The vestibular system is made of five sensory organs on each side of the head embedded in the petrous portion of the temporal bone. There are the superior, posterior, and lateral semicircular canals as wells as the utricle and saccule [10].

Statement of Study

Does the vestibular adaptation exercises effects on motion sickness?

Aims and Objectives: To investigate the effect of vestibular adaptation exercises on motion sickness.

Hypothesis

Experimental Hypothesis

The Vestibular adaptation exercises decreases the motion sickness.

Null Hypothesis

The Vestibular adaptation exercises does not effect on motion sickness.

Significance

1. This research should be able to give concrete baseline information regarding the effects of vestibular adaptation exercises on motion sickness and its modification for therapeutic intervention.

2. The result of this study would be widely applied in clinics as well as in hospitals.

3. This research would upgrade the professional skills and show the path for future research.

Materials and Methods

Vestibular Adaptation Exercises: There are numerous exercises but the most popular exercises are: 1. Head fixed, object fixed & eye balls moving. 2. Head fixed, object & eye balls moving. 3. Head moving, object fixed && eye balls moving. 4. Head, object & eye balls moving.

Sample selection

Convenient sample of 25 subjects with the signs and symptoms of motion sickness while travelling in a bus, car or train, according to the inclusion and exclusion criteria, will be included in the study. The study will be conducted in the O.P.D. of Physiotherapy at CSS Hospital and Jai Physiotherapy and Dental Clinic, SF-06, Ansal Galleria, Ansal Town, Meerut.

Duration of study: 1year

Variables

Dependent variable:

Motion sickness

Independent variable:

Vestibular adaptation exercises

Inclusion Criteria

- Age between 17 – 25 years.
- Presence of signs and symptoms of motion sickness.
- Normal subjects without any pathology.

Exclusion Criteria

- Individuals on medications for motion sickness.
- Individuals with any kind of central or peripheral vestibular pathologies.
- Subjects who are suffering from any kind of injury, fracture or any other pathology.

Protocol After getting theirinformed consent, the protocol of the vestibular adaption exercises was told to them.

Vestibular Adaptation Exercises

1. Rising while focused INTENSITY: 5 repetitions / 30 seconds. Total= 20 repetitions. 2 minutes break after every 5 repetitions. DURATION: 10 min

2. Moving head while focused INTENSITY: 5 repetitions / 30 seconds. Total= 20 repetitions. 2 minutes break after every 5 repetitions. DURATION: 10 min.

3. Focus on moving target INTENSITY: 5 repetitions / 30 seconds. Total= 20 repetitions. 2 minutes break after every 5 repetitions. DURATION: 10 min.

4. Move with moving target INTENSITY: 5 repetitions / 30 seconds. Total= 20 repetitions. 2 minutes break after every 5 repetitions. DURATION: 10 min.

Total Duration will be 40 min per session, twice a day (40 + 40 min), = 80 min every day, per week for 12 weeks.

Time of Scoring

All the scoring of data will be recorded prior to the commencement of the treatment and after every week till 12 weeks by using a motion sickness severity questionnaire.

Procedure

Rising While Focused

Sitting in a chair, focus on a stable object across the room, 5 to 10 feet away. Keeping your focus on this object, stand up. Repeat this exercise as prescribed and remain balanced. Then practice sitting and standing with your eyes closed.

Moving Head While Focused

Focus your gaze on a bright object about 5-feet away. This could be a picture on the wall or a targetprinted on a piece of paper and tacked to the wall. Keep your eyes focused on this object while you turn your head from side to side, slowly at first, then more rapidly.

Focus on Moving Target

This time, you remain still but follow the movement of a target with your eyes. The direction of the target'smovement will vary, from side to side to up and down and diagonal.

Move with Moving Target

While focused on a target, you'll be asked to move your head in the opposite direction of the target, while keeping your eyes locked to the target. You may also be asked to move in the same direction as the target [11].

Data Analysis

The effect of vestibular adaptation exercises will be recorded on motion sickness susceptibility questionnaire on 1st ,2nd , 3rd ,4th , 5th , 6th ,7th , 8th, 9th , 10th , 11th and 12th week and will be compared with the readings which will be taken prior to the treatment. The mean standard deviation (S.D) and standard error (S.E) will be calculated to perform the entire statistical data. The "t" test will be used for analysis and the significant difference will be calculated from the statistical data.

Required instruments

- Questionnaire
- Stationary
- Inches tape
- Stop watch
- Target
- Chair/Stool

References

1. Benson, AJ. Motion sickness. In: Medical Aspects of Harsh Environments. 2002; 35.

2. Motion Sickness Prevention and Treatment.

3. R.H.Y, Finney, C.M .and Goonetilleke, R.S., "Motion sickness susceptibility and occurrence in Hong Kong Chiness." Contemporary Ergonomics 1999, Taylor and Francis, pp.88-92.

4. General medical Officer (GMO) Manual : Clinical section: Motion sickness.

5. Benson, AJ. Motion sickness.In:Medical Aspects of Harsh Environments, Motion Sickness Prevention and Treatment, Woodhouse's English-Greek Dictionary. 2002; 35; 745.

6. Banks RD, Salisbury DA, Ceresia PJ. The Canadian Forces Airsickness Rehabilitation Program: 1981– 1991. Aviat Space Environ Med. 1992; 63: 1098–1101.

7. Koch KL. Adaptation to vection induced symptoms of motion sickness. Aviat Space Environ Med. 1989; 60: 566–572.

8. O'Hanlon JF, McCauley ME. (1974). Aerospmed.45 (4): 366-9.PMID 4821729.

9. General medical Officer (GMO) Manual: Clinical section: Motion sickness.

10. Herdman SJ, Clendaniel RA. Eds. Vestibular Rehabilitation. 4th ed. Philadelphia: F.A. Davis Co.; 2014. 11. Wall C, Vrabec JT. Vestibular Function and Anatomy. In: Head & Neck SurgeryOtolaryngolog. Philadelphia, Lippincott Williams & Wilkins. 2001; 1641-1650.

11. Herdman SJ (ed), F.A. Davis Co, Philadelphia, 2000.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 28/07/2018

Head of Department Neurological Physiotherapy

Name of Department:

Name of College: Jyotirao Phule subharti college of physiotherapy

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

This study has shown that effect of vestibular adaptation exercises on motion sickness. the values of the motion sickness susceptibility questionnaire clearly shows that the vestibular adaptation exercise effectively reduce the signs and symptoms of motion sickness. therefore, vestibular adaptation exercise can be safely used to reduce signs and symptoms of motion sickness in clinical and hospital settings and also for home based program.

External Support:

Supported by Yowaker Scientific And Social Sciene Research foundation.

Name of PI: Anshika Singh

Name of the Department: Neurological Physiotherapy

Signature of the P.I.

Name of College: Jyotirao Phule Subharti College of Physiotherapy.

Employee Code of PI:

Title of the Project: Role of vestibular adaptation exercise on motion sickness.

Duration of the Project: 1 year.

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING
SWAMI VIVEKANAND SUBHARTI UNIVERSITY

Study the strength of concrete by using silica fume and GGBS with magnetized water

REPORT

Under

Resource Mobilization for Research

Shivam Singhal

(Co- Investigator)

Er. Abhishek Tiwari

(Principal Investigator)

Assistant Professor,
Department of CE,
SITE, SVSU

Summary Sheet

1. **Name of the Principal Investigator:**Er. Abhishek Tiwari
   PhoneNo:8392953227 **Email: abhishektiwari839@gmail.com**
2. **Institution :**Subharti Institute of Technology & Engineering
3. **Project Title:** Study the strength of concrete by using silica fume and GGBS with magnetized water

Introduction

Concrete's adaptability, durability, sustainability, and economy have made it the worlds most extensively used construction material. The term concrete attribute to a mixture of aggregates, usually sand, and gravel, held together by a binder of cementitious paste. The paste is consistently made up of Portland cement and water and may also contain supplementary cementing materials (SCMs), such as fly ash or slag cement, and chemical admixtures.

Presently we are using different grades of concrete like M20, M25, M30, M35, M40 etc. The difference in strength of M30 and M35 is nearly 15%. But we come to cost the difference to produce 1 m3 is nearly INR 500. We have found a way in which by using the design mix of M30 we can get the strength of M35 i.e. we have manage to increase the current strength of concrete mix by nearly 15%. It will help to minimize the cost of the comprehensive structure without compromising with the strength of the structure.

The cement molecules undergo the process of hydration. When we use tap water the cement particles undergo hydration with small bunch of molecules. But when we use magnetized water, the particles are precisely hydrated with individual molecules of water, due to which complete hydration of cement particles takes place. Due to this complete hydration, strength is gained with all admixtures.

Material used

Cement

Ordinary Portland Cement of 53 grade confirming to IS: 12269-1987(9) was used in this study. The properties of Portland cement are shown in Table.

S. No	Property	Results
1	Normal Consistency	32%
2	Initial Setting Time	45min
3	Specific Gravity	3.15
4	Fineness of Cement	5%

Coarse Aggregate

Crushed aggregate confirming to IS: 383-1987 was used. Aggregates of size 20mm and 12.5 mm of specific gravity 2.74 and fineness modulus 7.20 were used.

Silica Fume (Grade 920 D)

The Silica fume is used as a fractional replacement of cement. The properties of silica fume are shown in Table

Ground granulated blast furnace slag (GGBFS)

The ground granulated blast furnace slag (GGBFS) is a derivative of iron manufacturing which when combined to concrete improves its properties such as workability, strength and durability.

Production of magnetized water

By using the concept of solenoid, magnetic water was prepared. A box built of plywood/cardboard of dimension 0.5m x 0.5m x 0.5m was used with a wax coating inside it. This box is put up inside a cube of bricks. Copper wire of 20 gauges of about 10m.An ac/dc converter was used to convert the AC voltage at home to DC voltage. Current of about 3 ampere and voltage of 19.5 V was obtained. With 100 numbers of turns of copper wire wrapped on a core was used. The water was passed inside the solenoid through PVC pipes at a constant rate of 10cc/s. The water is contain in the water container of mixer to be used at site but since the container is made of metal we need to coat it with wax as water starts falling its magnetization with contact of metal.

Experimental study

Compressive Strength by using Normal Water

S. No.	Test Parameter	Unit	Observation
1.	Compressive Strength	N/mm2	31.92
2.	Compressive Strength	N/mm2	31.74
3.	Compressive Strength	N/mm2	29.48

Compressive strength by using magnetic water

S. No.	Test Parameter	Unit	Observation
1.	Compressive Strength	N/mm2	36.73
2.	Compressive Strength	N/mm2	36.92
3.	Compressive Strength	N/mm2	37.41

Compressive strength by using silica fumes

S. No.	Test Parameter	Unit	Observation
1.	Compressive Strength	N/mm2	37.9
2.	Compressive Strength	N/mm2	37.3
3.	Compressive Strength	N/mm2	38.0

Compressive strength by using GGBS

S. No.	Test Parameter	Unit	Observation
1	Compressive Strength	N/mm2	43.8
2	Compressive Strength	N/mm2	43.5
3	Compressive Strength	N/mm2	44.2

Major outcomes

1) The compressive strength of the sample using magnetized water is nearly 15% more as compared to sample made by using normal water.

2) When we replaced cement by GGBS the compressive strength increases up to 36%.

3) There is also an increase in workability of concrete.

4) The maximum compressive strengths 44.20 N/mm2 were attained at 10% replacement of cement by GGBS by Normal Curing.

5) If we used magnetized water then there is reduction in cost also per meter cube.

6) Reduction in annual production of carbon dioxide due to manufacturing of cement as less cement is needed for more strength.

7) Currently we are using different grades of concrete like M20, M25, M30, M35, M40 etc. The difference between strength of M30 and M35 is about 15%. But we come to cost the difference to produce 1 m3 is nearly INR 500. We have found a way in which by using the design mix of M30 we can extract the strength of M35 i.e. we have found a way to increase the current strength of concrete mix by nearly 15% in conventional concrete.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 24/07/2018

Head of Department

Name of Department: Civil Engg.

Name of College: S.I.T.E

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

* The compressive strength of the sample using magnetized water is nearly 15% more as compared to sample made by using normal water.
* When we replaced cement by GGBS the compressive strength increases upto 36%.
* If we used magnetised water then there is reduction in cost per metre cube.

External Support:

Younker Scientific and Social Science Research foundation, Hapur

Name of PI: Abhishek Tiwari

Name of the Department: Civil Engg.

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

Signature of the P.I.

Title of the Project: Study the strength of concrete using Silica fume & GGBS with magnetised water.

Employee Code of PI:

Duration of the Project: 01 Year.

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING

SWAMI VIVEKANAND SUBHARTI UNIVERSITY

ENERGY TAPPING AND DETECTION

PROJECT COMPLETION REPORT

Submitted by

Ms. Vartika Tyagi

(Principal Investigator)
Assistant Professor,
Department of ECE
SITE, SVSU

Mr. Ravi Prakash Singh

(Co-Principal Investigator)

2016-17

Index

Summary Sheet

(i) Name of the Principal Investigator : Ms. Vartika Tyagi

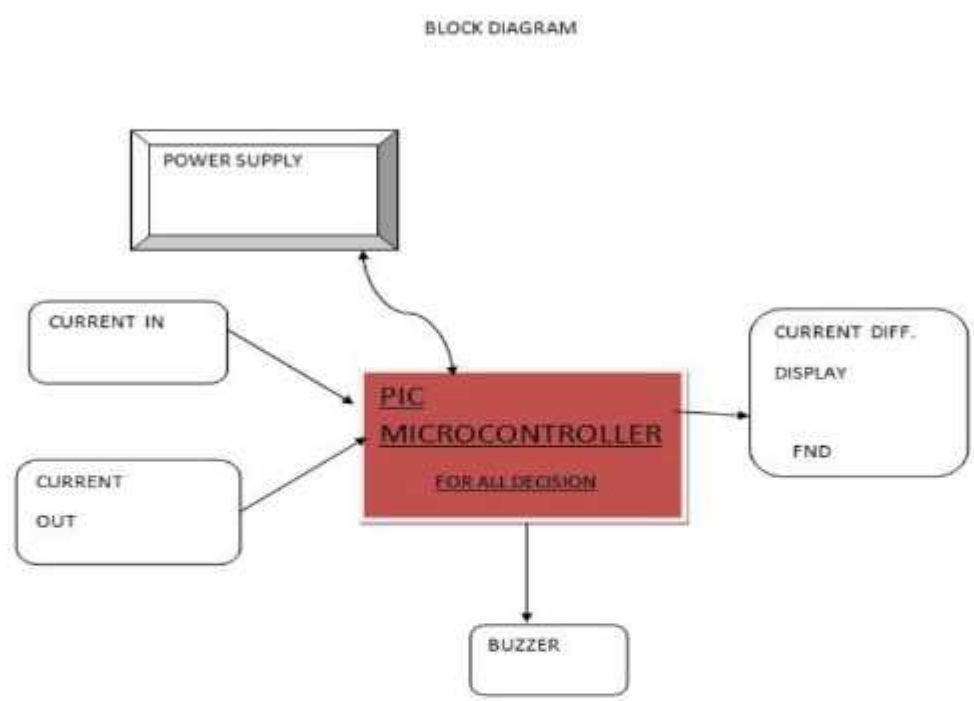
(ii) Institution : Subharti Institute of Technology & Engineering

(iii)Project Title: Energy tapping and detection

1. Abstract and Introduction:

Theft of energy directly from the main line is the biggest problem in our country, especially in rural areas, a lot of energy is handled and our Electricity sector does not have any suitable instrument to detect exactly where the energy is stolen. The project aims to design an instrument to identify energy consumption directly from the grid system. Therefore, the works of this undertaking are being carried out for the benefit of the State Electricity Secretariat. The concept involved in the system is to measure the current flowing in the power transmission line in sensitive areas, the sensitive area is defined as where the transmission lines pass very close to a village or pass over an agricultural field and people are taking advantage of the energy for function. the pump is configured. In these areas, the current is measured with two CTs (current transformers), these CTs are arranged on each side of the sensitive area, in series with the phase. Now, the current flowing through the primary CT is converted to digital and supplied to the microcontroller. The controller displays the current in amperes, since the current of two CTs must be measured; two different systems are designed with two microcontroller units. A unit, which must be installed at the starting point of a specific zone, can be called a master unit. The other unit can be installed at the other end of that specific area, the current that flows through this Ct unit is transmitted in digital format.

2. Block Diagram



3. Methodology :

It contains a current transformer that is used to receive voltage. Here, we use the FND to display current difference information, buzzer for different indications. We are using an image controller to measure the analog current. The PIC microcontroller has built-in ADC, it can detect an analog signal and convert it to digital if the voltage range is out of range.

The concept involved in the system is to measure the current flowing in the power transmission line in sensitive areas, the sensitive area is defined as where the transmission lines pass very close to a village or pass through an agricultural field and people are taking advantage of the energy for function. the pump is configured. In these areas, the current is measured with two CTs (current transformers).

These CTs are arranged on each side of the sensitive area, in series with the phase. Now, the current flowing through the primary CT is converted to digital and supplied to the microcontroller. The controller displays the current in amperes, since the current of two CTs must be measured; two different systems are designed with two microcontroller units. A unit, which must be installed at the starting point of a specific zone, can be called a master unit.

The other unit can be installed at the other end of that specific area, the current that flows through this Ct unit is transmitted in digital format.

4. Working Description with various sections :

POWER SUPPLY SECTION:

Consists of:

1. **RLMT Connector**--- It is a connector used to connect the step down transformer to the bridge rectifier.
2. **Bridge Rectifier** --- It is a full wave rectifier used to convert ac into dc , 9-15v ac made by transformer is converted into dc with the help of rectifier.
3. **Capacitor:** -----It is an electrolytic capacitor of rating 1000M/35V used to remove the ripples. Capacitor is the component used to pass the ac and block the dc.
4. **Regulator:** ----LM7805 is used to give a fixed 5v regulated supply.
5. **Capacitor:** -----It is again an electrolytic capacitor 10M/65v used for filtering to give pure dc.
6. **Capacitor:** ----- It is an ceramic capacitor used to remove the spikes generated when frequency is high(spikes).

So the output of supply section is 5v regulated dc.

MICROCONTROLLER SECTION:

Requires three connections to be successfully done for it's operation to begin.

1. **+5v supply:** This +5v supply is required for the controller to get start which is provided from the power supply section.

2. **Crystal Oscillator:** A crystal oscillator of 4 MHz is connected at pin no.9, and pin no.10, to generate the frequency for the controller. The crystal oscillator works on piezoelectric effect.The clock generated is used to determine the processing speed of the controller. Two capacitors are also connected one end with the oscillator while the other end is connected with the ground. As it is recommended in the book to connect two ceramic capacitor of 22 pf to stabilize the clock generated.
3. **Reset section:** It consists of an RC network consisting of capacitor and one resistance . This section is used to reset the controller.

DISPLAY SECTION:

FND (Functional Numeric Display)

FND is similar to the seven segment display but it has one more segment db for decimal. It has eight LEDs. The current specification for an led is 5MA-25MA. The safe range for the current to select is the mid value that is12MA and voltage required is 5v so the resistance required to limit the current in led is calculated by the ohm's law i.e. V=IR, R=V/I and hence R comes to about 470ohm.

FND are connected to the microcontroller at i/o port like p0,p1,p2,or p3

And also a transistor is required to get the fnd on or off. The base resistance required for the transistor is also 470ohm.

The message to be displayed on fnd is programmed through software.

5. Conclusion

i. With this project can identify energy tapping

ii. Based on cutting edge technology called Embedded development Detection of fault and preventing is possible.

iii. The project developed can bring financial benefits too if implemented properly

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Name of Department: ECE

Name of College: SITE

Date: 26/03/2018

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

With this project can identify energy tapping. Based on cutting edge technology called embedded development detection of fault & preventing is possible. The project developed can bring financial benefits too. This project aims to design an instrument to identify energy consumption directly from the grid system.

External Support:

Indraprastha Private I.T.I

Name of PI: Ms. Vartika Tyagi

Name of the Department: ECE

Name of College: SITE

Title of the Project: Energy Tapping & Detection

Duration of the Project: 6 Month

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

SUBHARTI INSTITUTE OF TECHNOLOGY & ENGINEERING
SWAMI VIVEKANAND SUBHARTI UNIVERSITY

PID And Fuzzy logic Based Analysis Of MPPT In Wind Energy Conversion System

REPORT

under
Resource Mobilization for Research

Anup Kumar Jaiwal

(Co- Investigator)

Er. Dhairya Narayan

(Principal Investigator)

Assistant Professor,
Department of EEE,
SITE, SVSU

Summary Sheet

Name of the Principal Investigator: Er. Dhairya Narayan

Phone No: 8826635040 **Email:** dhairyarajput025@gmail.com

Institution : Subharti Institute of Technology & Engineering

Project Title : PID And Fuzzy logic Based Analysis Of MPPT In Wind Energy Conversion System

Abstract :

In recent years, the concern about the long-term health and environmental effects of conventional electricity generation has been growing. Earth surface is not exposed to the same kind of heat intensity and it is well reflected in the movement of large air mass on the Pace of the earth. This has been necessitated because the present usage needs an energy infrastructure, with a eye on tapping of energy from renewable source with more sustainability. As the gap between supply and demand expands year after year, technologist and scientists are on the look out to find a new source of energy. Though our traditional non-renewable sources help us lot to meet out our energy need, they have their own limitationandareconsideredharmfultotheenvironmentinthecontextofpollutionitcontributestoourenvironment. We are forced to have a second thought and tapping of energy from this available sourcesvigoursly. So our attention is directed towards nuclear energy but the bitter experience that the Russianexperienced in thecase ofChernobyland therecent nuclear accidentthattook placein Japan putacheck on our endeavor to harness energy from this source also. This report is according to MontereyInstituteofInternationalStudies,May2010.Sowearefinallyleftwiththeoptionofwindenergyasit is aseasonal one still we areupset in ouronward journey to harness energy,wefind a silver line inthe dark , by converting some drawback into advantagewe can meet our energyneed boldly in thefuture. Wind energy conversion systems convert the kinetic energy of the wind into electricity or otherforms of energy. Wind power generation has experience datremendous growth for the past ten years, and has been recognized as an eco friendly and economically competitive means of electric powergeneration.Asthepenetrationofwindenergyintopowersystemsincreases,theeffec

tsofwindfarmsonpower system operation will become an increasingly important factor in theirprofitabilityandmanagement.Windpowercapacityhasexperiencedatremendousgrowthinthepasttenyears,thankstowindpower'senvironmentalbenefits,technologicaladvancement,andgovernmentincentives.Worldwide development of wind energy has been expanded rapidly since early 1990s. Due to extensive R&D efforts during the past ten years, wind energy conversion has become a reliable and competitive means for electric power generation. The life span of modern wind turbines is now within the range of20-25 years, which is comparable to many other conventional power generation technologies. The cost of wind power has continued to decline through technological development, increased production level,and the use of larger turbines.

According to world wind energy report, in the year 2008, the total contribution of energy from wind power system is around 9590 M W in India. According to the Ministry of new and renewable energy in India, it is estimated by the end of year 2012, the total installed capacity of wind energy may reach the target of 18,420 M W. Wind Power in India reported, Tamil Nadu has an installation capacity of wind energy around 7,150 M W as on January 2013, which is 41 per cent that of the country. The aim is toensurethatby2030,windenergy will be the most cost-efficient energy source in the market.

This is not a small achievement while considering the rapid advance in the sizeof wind generators and in the field of power electronics and their applicability in the extraction of wind power. On one side there is agrowing demand forgreen energy and

on the other side the rising cost of turbine and the compulsion one feel in supplying green electricity tothegrid,createanewsituationwhereoneshoulddosomethingtoimprovethepoweroutput.

Earlier wind turbines were based on Squirrel-Cage Induction Generators (SCIGs) directly connected to the grid. Recently,the technologyhasdevelopedtowardsvariablespeedDoublyFedInductionGenerators(DFIG).

The controllability of the wind turbines becomes more and more important as the power level of theturbines increases.Power electronics,being the technology of efficiently converting electric power,plays an important role in wind power systems. It is an essential part for integrating the variable-speedwind power generation unitsto achieve high efficiency and high performance inpower systems. Evenin a fixed-speed wind turbine system where wind power generators are directly connected to the grid,thyristorsareusedas soft-starters.

Thepowerelectronicconvertersareusedtomatchthecharacteristicsofwindturbine swiththerequirements of grid connections, including frequency, voltage, control of active and reactive power,harmonics, etc. The use of power electronic converters allows for variable speed operation of the windturbine, and enhanced power extraction. In variable speed operation, a control method is designed toextract maximum power from the turbine and provideconstant grid voltageand frequency.A widerange of control schemes, varying in cost and complexity, have been investigated for all the previouslyconsidered conversion systems. All control schemes integrated with the power electronic converter, are designed to maximize power output at all possible wind speeds,.

.

6. Major Work Done

Electricgeneratorisusedwithwindturbinewhichconvertsmechanicalene rgyintotheelectrical Energy.Electrical energy productionmainly dependson the availabilityofwind.With variation in wind speed, electric energy production can be increased or decreased. Soselectionofareaforwindenergysysteminstallationisimportant.

The schematic of the wind energy system to which the MPPT applied is shown in Fig.2.Generator used is of permanent magnet synchronous generator type which is directly coupledto turbine due to its advantages like no need of gear box, small size, very less maintenancecost, no requirement of excitation current[6]. Instead of using three-phase controlled rectifier,diode bridge rectifier is used which converts the AC to a DC by rectifying voltage at constantlevelusingboost converter.

Tracking the maximum power point (MPP) of a photovoltaic array is an essential stage of aWIND system [7] [8]. As such, many MPPT methods have been introduced and numerousvariants of each method have been proposed to overcome specific disadvantages. The largenumber of methods proposed can makeit difficult todetermine thebest technique to adoptwhen implementing a WIND system. The methods all vary in complexity, number of sensorsrequired, digital or analogue implementation, convergence speed, tracking ability, and costeffectiveness.Furthermore,thetypeofapplicationcanhaveasignificantimpactontheselection of MPPT algorithm. For this reason, this paper summarizes the most popular MPPTtechniques in use today. Two promising methods are then highlighted for consideration whenimplementingasystemwhichneedstocopewelloverawiderangeofirradianceconditions.

The maximum power is computed online using a modified perturb and observe algorithm. Thecomputed maximum power is compared with instantaneous actual WIND power, the errorbetween reference (maximum) power and actual power activates ON/OFF controller with ahysteresis band to drivethe buck chopper. Therefore, the instantaneous power extracted fromtheWINDismaintainedbetweenthetolerancebands.

Methodology :

In puts and out put so wind turbine are defined as follows:

> Thewindspeedisexpressedasanindependentinput.Itisdefinedasenergyinputtowindturbine.

> Specific(special)magnitude soft turbine are defined as input parameter.

> Magnitudes belong to turbine speed, rotor bladepitchandrotorbladegapangleformthetransmissionparametersofthewindenergyconversionsystem.

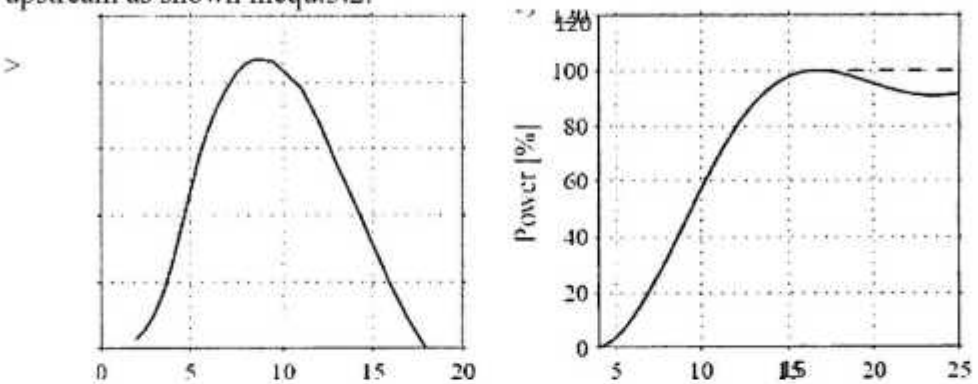
> Wind turbine output magnitudes are defined as power and propeller moment. With determination ofinput and output variables of the wind turbine, expressions relating input and output variables can beeasilyobtained.Equationsdefiningrelationsbetweentheobtainedpowerandbladespeedarerelatedto the mechanical power in moving air flow and can be expressed as flow $(\rho A v)v$

rate of kinetic energy persecondasshown inequ.3.1 .

^{2}=1/2pAv3 (3.2)

Here, P isthe mechanical power in the moving air(watt),p is air density (kg/m3),A is areaswept ofthe rotorblades(m),and visvelocityoftheair(m/s).

The mechanical power extracted by the blades is expressed as a fraction of the upstream as shown inequ.3.2.



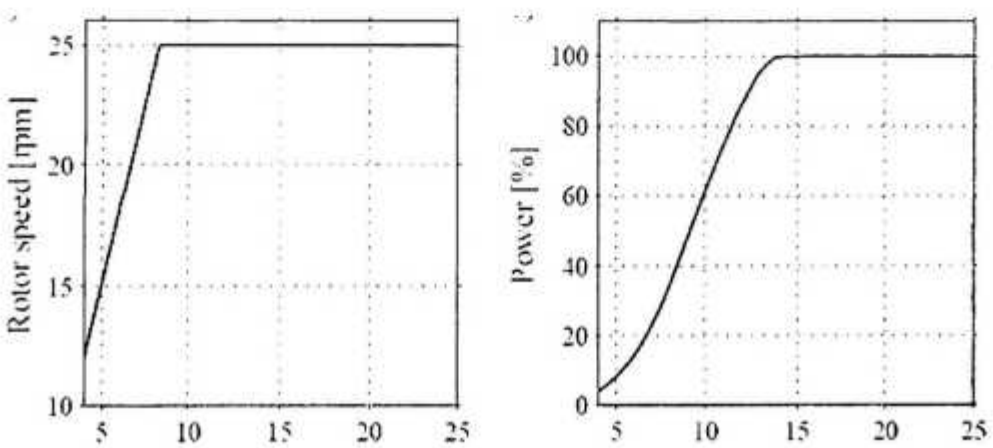


Figure3.3a)Thepowercoefficient,Cp,asafunctionofthetipspeedratio,A.

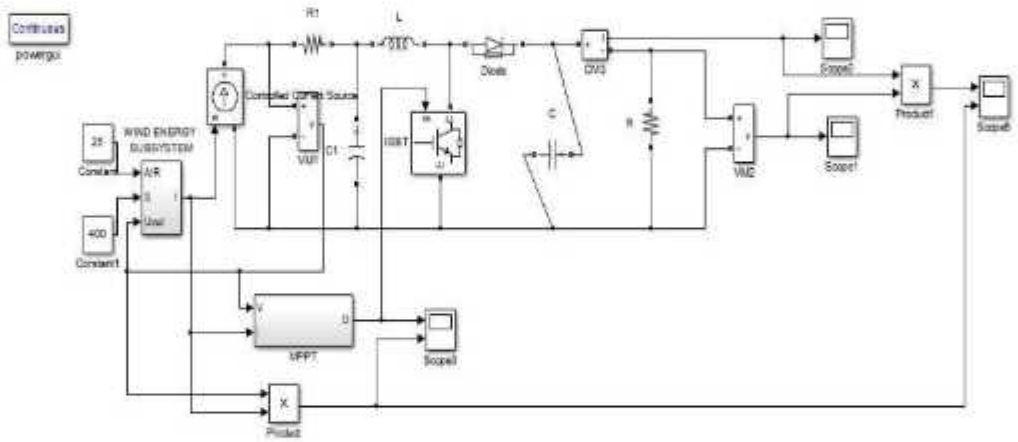
b)Mechanicalpowerasafunctionofwindspeedatratedrotorspeed(solidlineisfixedpitchangle, i.e.,stall control anddashedlineisactivestall).

Formodelingofdynamicbehaviorofwindturbines,ifthepowercoefficientCpchanges,dependingonthetip speedratioandthebladegapangleisplacedinequation (3.l)andrearranged,thefollowingequationis

obtained:$P=l/2pAv^3cp(1.F)$

(3.7)

In Figure3.3, an example of a ß) curve and theshaft power as a function of the wind speed for ratedrotorspeed, i.e., a fixed-speed wind turbine, can beseen.In Figure3.3 b) the solid line corresponds toafixedpitchangle,ß,whiledashedlinecorrespondstoavarying(activestall).



7. Major outcomes

Table.1:PID Power Generation

PIDPOWERGENERATION		
INPUTSTREAMWIND	OUTPUTTIMESTABILITY	EFFICIENCY
1000	9	97%
2000	10.79	98%
500	10	85%
800	8	70%
1500	10	96%

Table.1 gives output time stability in PID Wind Power Generation and

Table 6.2 gives for Fuzzy Logic. Figure 6.7, 6.8, 6.9 and 6.10 represents improved results in graphs for PID and Fuzzy Logic.

Table.2:Fuzzy Logic Power Generation

FUZZYLOGICBASEDWINDPOWER GENERATION		
INPUTSTREAMWIND	OUTPUT TIMESTABILITY	EFFICIENCY
1000	9.24	97.58%
2000	11	98.36%
500	9.85	85%
800	7.36	70.36%
1500	9.745	96.36%

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 25/6/2018

Head of Department

Name of Department: EEE

Name of College: SITE

Findings of the project: (Max-100 words): The simulation of the MPPT technique achieves the maximum power point of wind energy system as well as PV system. The features of simulation circuit are: Both renewable sources are stepped-up using boost Converter; Different MPPT technique is employed for each source and also individual operations are supported.

External Support: from YSSSRF

Name of PI: Dhairya Nariyan

Name of the Department: EEE

Name of College: SITE

Title of the Project: PID & Fuzzy logic based Analysis of MPPT in Wind Energy Conversion System.

Duration of the Project:

Signature of the P.I.

Employee Code of PI:

Registrar
Swami Vivekanand
Subharti University
MEERUT

Project Title

"A Supply Chain Economic production quantity Model for Deteriorating Items with Multiple Production Setups and Rework with Shortages and Trade Credit"

SWAMI VIVEKANANDA
SUBHARTI UNIVERSITY

Name : Dr. Vikas Kumar

Designation : Associate Professor

Department : Mathematics and Statistics

E-mail ID : vt46460@gmail.com

Phone : +91-9897103420

Faculty : Science

Faculty: Dr Vikas Kumar and Dr Jitendra Kumar

Department: Mathematics

Principal investigator: Dr Vikas Kumar

Co-Principal Investigator: Dr Jitendra Kumar

Title of the proposed research project:

A Supply Chain Economic production quantity Model for Deteriorating Items with Multiple Production Setups and Rework with Shortages and Trade Credit

Objective:

The objective of this study is to formulate and determine the optimal replenishment policy for EPQ model with shortage and trade credit. Rework is the main issue which can reduce production cost and environment problem. In this study we produce one rework setup after m production setups. Along with rework setups shortages are allowed which is fully backordered and trade credit policy is applied in which suppliers offers deferred period to their customer in supply chain system.

Details of expense required for the project

Expected expense: Almost Nil

Instrument:

S. No.	Name of the instrument	Remark
1.	Computer	Own computer
2.	A_4-Sheets	
3.	Pen Pencils etc	

Duration of the project: 3 Months

Introduction:

Today's global market buyer needs a good quality product at reasonable price. In order to produce high quality products defective products should be eliminated through 100% screening; to avoid the wastage of defective items rework process is adopted. In rework process used and defective items are reworked to reduce waste and environment problems. In order to increase sale supplier offers trade credit period to their customers. This trade credit means that supplier offers the customer a permissible delay in payment to attract new customer to increase sale.

Methodology:

1. The rate of producing good quality items and rework must be greater than the demand rate.
2. No machine breakdown occurs in the production run and rework period.
3. Production, rework and demand rate are constant.
4. Deteriorating rate is constant.

5. Defective items are generated only during production period. Rework process results in only good quality items.
6. The rate of producing good quality items should be greater than the sum of the demand rate and the deteriorating rate.
7. Shortages are allowed and are fully backlogged.
8. The supplier allows a fixed period M, to settle the account. During this period no interest is charged but beyond this period, interest is charged under the terms and condition agreed upon.

Outcome of the project:

In this study, Economic production quantity model is developed for deteriorating items with rework process, shortages and trade credit is also allowed. The sensitivity analysis is done by considering one production cycle. The optimal production time is sensitive to production rate, shortage cost, production setup cost, demand and optimal cost is also increase with increase in production rate, shortage cost and production setup cost. The time period of occurrence of shortage almost remain same for change in different parameters. Total cost almost ineffective for deteriorating rate, trade credit, rework setup cost and serviceable setup cost.

References

1. Widyadana, G.A., Wee, H.M. 2012. An EPQ model for deteriorating items with multiple production setups and rework. Int. J. Production Economics 138, 62-67.
2. Sarkar, S., Chakrabarti,T., 2013. AN EPQ model having weibull distribution deterioration with exponential demand and production with shortages under permissible delay in payments. Mathematical theory and modeling 3.
3. Amutha, R., Chandrasekaran, E., 2013, An inventory model for constant demand with shortages under permissible delay in payments. IOSR Journal of Mathematics 6, 28-33.
4. Dobos, I., Richter, K., 2004. An extended production/recycling model with stationary demand and return rates. International Journal of Production Economics 90,311–323. Feng,
5. Y., Viswanathan, S., 2011. A lot-sizing heuristic for manufacturing systems with product recovery. International Journal of Production Economics 133, 432–438. Flapper,
6. Jaber, M.Y., Bonney, M., Moualek, I., 2009. An economic order quantity of an imperfect production items with entropy cost. International Journal of Production Economics118, 26–33.
7. Jamal, A.M.M., Sarker, B.R., Mondal, S., 2004. Optimal manufacturing batch size with rework process at a single-stage production system. Computers & Industrial Engineering47, 77–89.
8. Khan, M., Jaber, M., Guiffrida, Y., ZolfaqhariS., A.L., 2011. A review of the extensions of a modified EOQ model for imperfect quality items. International Journal of ProductionEconomics132, 1–12.
9. Taleizadeh, A.A., Wee, H.M., Sadjadi, S.J., 2010. Multi-product production quantity model with repair failure and partial backordering. Computers & Industrial Engineering 59,45–54.

10. Teunter, R., 2004. Lot-sizing for inventory systems with product recovery. Computers &IndustrialEngineering46, 431–441.
11. Wee, H.M., Lee, M.C., Yu, Jonas C.P., Edward Wang, C., 2011. Optimal replenishment policy for a deteriorating green product: life cycle costing analysis. International Journal of Production Economics133, 603–611.
12. Widyadana, G.A., Wee, H.M., 2010. Revisiting lot sizing for an inventory system with product recovery. Computers and Mathematics with Applications 59, 2933–2939.
13. Widyadana, G.A., Ca´rdenas-Barro´ n, L.E., Wee, H.M., 2011. Economic order quantity model for deteriorating items and planned backorder level. Mathematical and Computer Modeling 54, 1569–1575.
14. Yang, P.C., Wee, H.M., 2006. A collaborative inventory system with permissible delay in payment for deteriorating items. Mathematical and Computer Modeling 43,209–221.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 31.05.2018

Head of Department

Name of Department: Mathematics & Statistics

Name of College: K.V. Subharti College of Science.

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

In this project, Time period for occurring shortage almost remain same for changes in different parameters and here Economic production quantity model is developed for deteriorating items with rework process and trade profit by using sensitivity Analysis.

External Support:

Supported by Gyan Vigyan Sansthan

Name of PI: Dr. Vikas Kumar

Name of the Department: Mathematics & Statistics

Name of College: K.V. Subharti College of Science

Signature of the P.I

Title of the Project: A supply chain economic production quantity model for deteriorating items

Employee Code of PI:

Duration of the Project:

Registrar
Swami Vivekanand
Subharti University
MEERUT

ULTRASONOGRAPHIC EVALUATION OF KNEE IN OSTEOARTHRITIS WITH CLINICAL AND RADIOGRAPHIC CORRELATION

Research Proposal Submitted to

Swami Vivekanand Subharti University,

Meerut (U.P.)

By

DR. SAMEER R. VERMA

(2017-2020)

Department of Radio diagnosis & Imaging
Subharti Medical College, Meerut(U.P)

INTRODUCTION

Osteoarthritis (OA) is one of the most common medical conditions in elderly people.[1] Worldwide estimates suggested that 9.6% of men and 18.0% of women aged 60 years have symptomatic OA of the hips or knees.[2] It is also the most common reason for restricted daily activity [3]with significantly impact on the quality of life among affected people.[4] Pain is the predominant symptom of OA knee and is the main reason for medical consultation; besides, it the main reason of disability especially during painful episodes[6,7].

Conventional X-rays were used traditionally in diagnosing osteoarthritis knee by demonstrating the presence of osteophytes, bone deformities and joint space narrowing. However, studies on OA knee had demonstrated that there was not much correlation between the X-rays findings and the severity of OA knee pain[8-12].One possible reason for this weak correlation is that recent concept on osteoarthritis says that osteoarthritis knee is a whole joint disease involving not only the bones and cartilages; but also involves pathologies in the intra and periarticular soft tissues[13], while conventional X-rays is good at picking up bony lesions, they are falling short in giving accounts on the whole joint by its inability to directly visualize articular cartilage, synovial recesses, menisci and other soft tissues involved in the pathophysiology of OA knee.

Newer imaging modalities such as magnetic resonance imaging and high-frequency musculoskeletal ultrasonography offer an overall assessment of the osteoarthritic joint. MRI is accurate and reproducible for evaluating bone, articular cartilage and soft tissues[14]. Advantages of MRI include its non-invasiveness, multiplanar capability and excellent soft tissue contrast. However, MRI is expensive, time consuming and not widely available for routine use in most countries.

Ultrasonography (US) is an easily performed and non-invasive imaging technique, producing minimal discomfort to the patient and allowing the evaluation of the soft tissue changes in OA joint[15].Ultasonography has become the first-line imaging technique chosen by rheumatologists to obtain real-time imaging information in patients with painful joints[16]. Theability of US in assessing the periarticular and intra-articular abnormalities in knee OA[17], the reliability[18], and diagnostic performance[19]of the method have already been demonstrated. In the last years many studies were performed in order to establish the possible correlations between US findings and patient symptoms (especially pain) in knee OA[20-23] but no clear conclusions were drawn. All the authors underlined the need for more work in this field

This study is being undertaken to find possible correlation between knee pain scores and their radiographic and ultrasonographic findings and to compare if ultrasonographic finding have any better association with knee pain than conventional x rays .

AIMS AND OBJECTIVES

The aim of the study is to study the

1. The probable correlation between radiographic finding and pain score

2. The probable correlation between ultrasonographic finding and pain score

3. Whether ultrasonographic finding shows a better association of pain level than conventional x ray in patients suffering from primary knee osteoarthritis

MATERIAL AND METHODS

DESIGN-

Evaluation of knee by clinical, radiographic and ultrasonographic technique .

TYPE OF STUDY:

Prospective study.

SETTING:

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

PARTICIPANTS:

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 of 2 years, 1 OCTOBER 2017 TO 31 JULY 2019

INCLUSION CRITERIA:

Patients were screened for presence of knee pain in one or both knee for one or more than one month .if answer was yes they were screened for osteoarthritis knee using ACR clinical criteria . Those who qualified the criteria were included in study .

EXCLUSION CRITERIA:

1.Direct trauma to knee

2.Fibromyalgia, inflammatory arthritis, microcrystalline arthropathy

3.Had intra-articular injection or aspiration within the month prior to the study

4.Previous knee operation

5.Declined to undergo either ultrasonography or x-ray knee examination

6. Declined to be included in study

METHOD OF COLLECTION OF DATA:

-After obtaining clinical history according to ACR criteria -

VAS score for pain was taken

Usg examination was done on using high frequency probe

Digital x ray was done in weight bearing AP and lateral view

RADIOGRAPHIC EXAMINATION

All patients have weight-bearing anteroposterior and lateral knee radiographs which will be interpreted by a radiologists, blinded to the clinical and US findings . Assessement for osteophytes, femoral-tibial space, Kellgren–Lawrence (K-L) score and enthesopathies will

be done . K-L score evaluates the severity of knee OA using 5 grades from 0 (without radiological changes) to 4 (complex radiological changes) focusing on the presence of osteophytes and/or joint space narrowing [10]. Osteophytes and joint space narrowing was graded from 0 to 3 . The radiological soft tissue swelling with calcification seen at the site of insertion of a tendon or ligament is defined as enthesopathy.

Findings were noted under following headings -

1.Kellgren-Lawrence grading (0 to 4)

2. Maximum joint space narrowing grade (0 to 3)

3.Maximum osteophyte grade (0 to 3)

4.Joint width of medial tibio-femoral joint compartment

5..Joint width of lateral tibio –femoral joint compartment

USG PROTOCOL AND TECHNIQUE.

With the patient in supine position and complete extension of the knees, the size of tibial and femoral osteophytes will be recorded.

Osteophytes are defined as modification of the joint bone contour with protrusion seen in two planes. Then, medial and lateral meniscal protrusion will be measured in the place with the most important protrusion, as considered by examiner. Protusion has been defined as the perpendicular distance between the joint line and the outer edge of the meniscus in a longitudinal scan. A 30° flexion will be used to identify the synovial fluid in the suprapatellar recess defined as an abnormal hypoechoic or anechoic displaceable area .All these findings (osteophytes, meniscal protrusion, and synovial fluid) will be scored with a five-point scale: 0=normal, 1= from 0 mm to 2 mm, 2= from 2 mm to 4 mm, 3= from 4 to 6 mm and 4= more 6 mm

In a transverse plane and with the knees in maximum flexion, the femoral hyaline cartilage will be assessed and classified in 5 degrees: 0-normal, 1- loss of regular contour level interfaces or increased echogenicity cartilage, 2A- modification from degree 1 with decreasing the thickness of the cartilage <50% of his size, 2B-decreasing the thickness of the cartilage >50%, but under 100%, and 3- 100% focal loss of cartilage thickness

FINDINGS TO BE NOTED ON USG

1.Knee effusion in supra patella recess

2.Supra patellar synovitis ,synovial thickness

3.Cartilage thickness at

a. Lateral femoral condyle

b. Medial femoral condyle

4. Medial meniscus protusion

5. Lateral meniscus protusion

6. Maximum length of osteophytes at medial and lateral compartment

WORKING PERFORMA

Name: IP/OP No.:

Age/Sex: Date of Admission:

Socio Economic Status: Date of Discharge:

Address:

History of presenting illness:

1.Duration of pain

2.Site of pain

3.History of trauma

4.Association of pain with various position and posture (walking , rest , running , climbing stairs etc)

5.visual analogue scaling of pain

Past history

Previous relevant treatment / previous hospitalization / previous surgery (if any), whether diabetic or hypertensive.

Personal history:

If anything significant

Family history:

If anything significant

CLINICAL EXAMINATION

1. GENERAL PHYSICAL EXAMINATION

Vitals:

Blood pressure:

Pulse rate:

Temperature:

Height

Weight

Body mass index

Pallor

Icterus

Cyanosis

Clubbing

Oedema

Lymphadenopathy

2. KNEE EXAMINATION:

KNEE	Right	Left

3. Radiological Examination:

X-RAY Diagnosis:

1.KELLGREN-LAWRENCE GRADING (0 TO 4)

2. MAXIMUM JOINT SPACE NARROWING GRADE (0 TO 3)

3.MAXIMUM OSTEOPHYTE GRADE (0 TO 3)

4.JOINT WIDTH OF MEDIAL TIBIO-FEMORAL JOINT COMPARTMENT

5..JOINT WIDTH OF LATERAL TIBIO –FEMORAL JOINT COMPARTMENT

USG EXAMINATION

1.KNEE EFFUSION IN SUPRA PATELLA RECESS

2.SUPRA PATELLAR SYNOVITIS ,SYNOVIAL THICKNESS

3.CARTILAGE THICKNESS AT

A.LATERAL FEMORAL CONDYLE

B. MEDIAL FEMORAL CONDYLE

4. MEDIAL MENISCUS PROTUSION

5. LATERAL MENISCUS PROTUSION

6.MAXIMUM LENGTH OF OSTEOPHYTES AT MEDIAL AND LATERAL COMPARTMENT

ANNEXURE B

PATIENT INFORMATION SHEET

You are entering into a trial on " ..... "

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 the USG and Conventional X RAY have been reported to the patient.

I acknowledge that I understand the consent from and my participation is voluntary and give my consent for the study.

Date sign (patient's)

Date sign (researcher's)

Name of the doctor: Dr. Abhay Pratap Singh

Pg2017 batch

Mobile no :9105594240

Radio diagnosis

रोगी सूचनापत्र

आप एक परीक्षण on " ..... "में भाग लेने जा रहे है।

इस अध्ययन में भाग नहीं लेने का फैसला करने के लिए आप किसी भी सम्य आप पूरी तरह स्वतंत्र हैं।

भाग लेने से इनकार करने पर आप पर कोकै भी जुर्माना नहीं लगेगा और ना ही कोई हानि होगी। केवल शोधकर्ता को पता होगा की वह शोध का विषय है। शोध के दौरान या उसके बाद आपके द्वारा उपलब्ध करायी गयी जानकारी आपकी लिखित अनुमति के बिना दूसरे को नहीं बताई जायेगी| शोध के परिणामों की धोषणा में आपकी पहचान की गोपनीयता का पूरा ध्यान रखा जाऐगा।

USG के दुष्प्रभाव है रोगी को पूर्णनया सूचित किये हैं।

परीक्षण के दौरान विकिरण के दुष्प्रभाव से अगर हानि होती है तो उससे संबंधित उपचार की जिम्मेदारी हमारी है।

इस अध्ययन में मैं अपनी इच्छा से भाग ले रहा हैं और ऊपर दिये गये अध्ययन का हिस्सा बनने के लिये मैं सहमत हैं।

दिवनांक हस्काक्षर(रोगी के)

दिवनांक हस्काक्षर(रिर्सचर)

डाक्टर का नाम :

पो.जी.2017 बैच

मोबाईल न.9105594240

रेडियो निदान

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 16/11/2021

Head of Department

Name of Department: Deptt of Radio-Diagnosis & Imaging.

Name of College: Subharti Medical College.

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

Forty patients had B/L symptomatic knee OA and 10 U/L symptomatic OA. All knees showed radiographic FT degenerative signs. Knee effusion (47%), features of MM (61%), Baker cyst 25%. MMP was also medial FT space width ($P<0.01$). VAS score for pain in each knee greater than 50 showed significantly more U/L effusion.

External Support:

Shakya Muni Buddha National Inst. for Rural Development, Management & Technology

Knee effusion & MMP with MCLD are associated with pain in knee in OA. Ultrasound is proposed for assessment of periarticular & intra-articular abnormalities in pathophysiology of knee OA.

Esternal Supports by ~~Buddhist Education Mission~~ Sakyamuni Buddha National Institute for Rural Development, Management & Technology

Name of PI: Dr. Gaurav R Verma Dr. B.B. Thukral

Name of the Department: Department of Radio-Diagnosis & Imaging.

Name of College: Subharti medical college.

Title of the Project: Ultrasonographic evaluation of knee in OA with clinical & radiographic correlation.

Duration of the Project: 2016-2017.

Registrar
Swami Vivekanand
Subharti University
MEERUT

Effect of beverage on nanohardnesss and surface roughness of contemporary bulk fill composite material

Research Proposal Submitted

By

Dr. Vineeta Nikhil

Subharti Dental College

Background & Objective :- The purpose of the study was to evaluate the surface roughness and nanohardness of a newly introduced bulk filling material (Cention N) and compare it with another bulk fill composite (Tetric Evo Ceram) and a traditional nanofilled composite material (Filtek Z350 XT) using a profilometer and a nanoindentor respectively.

Materials & Methods:- 90 molds (5 mm in diameter and 2 mm in thickness) were prepared using a plastic straw and a BP knife blade and divided in three groups of 30 samples each of three different restorative materials.

Group 1 (n=30) – Filtek Z 350 XT (3M ESPE)

Group 2 (n=30) – Tetric Evo Ceram (Ivoclar Vivadent, Schaan, Liechtenstein UK)

Group 3 (n=30) – Cention- N (Ivoclar vivadent ,Schaan, Liechtenstein UK)

The molds were placed on the glass slab and the restorative material in each group was placed in one increment directly into the mold with the Teflon coated spatula. A mylar strip and a glass slide were then placed over the filled mold after which light pressure was applied to expel excess material from the mold. The samples were polymerized through the 1mm thick glass slide with the LED light curing unit (Unicorn Dentsply) calliberated at 650 mW/cm^2. Curing time was set at 40 seconds and all the samples were light cured from both the surfaces (top and bottom).

Finishing and Polishing of the samples was carried out by Shofu super-snap polystrips (PnL 526) strictly following the manufacturer's instructions. The specimens were immersed in distilled water for 24 hours and stored at 37°C before the first testing. Each specimen was then subjected to nanohardness and surface roughness testing.

Samples of each group were further divided into following subgroups according to the beverages in which they were immersed.

Subgroup T (n=10) - Thumps up (The coca cola company)

Subgroup G (n=10) - Green tea (Twinnings of London)

Subgroup B (n=10) - Beer (Kingfisher premium)

The samples were immersed alternatively for 5 s each, in 32.5 ml of each beverage respectively and in distilled water for 10 cycles at room temperature. The samples soaking protocol was simulated from an individual drinking a can of soft drink (325 ml). Total soaking time was 100 seconds. After the soaking sequence was completed, the samples were rinsed with distilled water, blotted dry and subjected to post immersion nanohardness and surface roughness testing. The data was calculated and the nanohardness and surface roughness of the baseline and post immersion measurements were compared using ANOVA and paired "t" test.

Results:- Among the experimental maximum nanohardness was observed in Z350 XT (0.806 GPa) and minimum nanohardness was observed in cention N (0.137 GPa). Amongst the experimental materials, maximum surface roughness was observed in Cention N (1.294 GPa) and minimum surface roughness was observed in Z350 XT (0.129 GPa)

Conclusions:- Within the limitations of this study, it can be concluded that –

Among all the experimental materials, maximum surface roughness before immersion was observed in Cention N and minimum surface roughness was observed in Z350 XT whereas maximum nanohardness was observed in Z350 XT and minimum nanohardness was observed in Cention N. All the experimental materials showed an increase in surface roughness and decrease in surface hardness after immersion in all the acidic beverages. Maximum % increase in surface roughness by all the beverages (Thumps up, Green tea and Beer) was observed in Z350 XT. Minimum % increase in surface roughness by thumps up was observed in Tetric Evo Ceram

whereas by green tea and beer was observed in Cention N. Maximum % reduction of nanohardness by Thumps up and Green tea was observed in Tetric Evo Ceram whereas by Beer, was observed in Z350 XT. Minimum % reduction of nanohardness by Thumps up was observed in Cention N, by Green tea in Z350 XT and by Beer in Tetric Evo Ceram.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 30.12.2017

Head of Department

Name of Department: Conservative Dentistry & Endodontics

Name of College: Subharti Dental College

Findings of the project: (Max-100 words): Among all the experimental materials, maximum surface roughness before immersion was observed in Cention N & minimum surface roughness was observed in Z350XT whereas maximum nanohardness was observed in Z350XT & minimum nanohardness was observed in Cention N. All the experimental material showed an increase in surface roughness & decrease in surface hardness after immersion in all the acidic beverages.

External Support: Cyon Amit oral foundation

Registrar
Swami Vivekanand
Subharti University
MEERUT

Name of PI: Dr. Vineeta Nikhil

Name of the Department: Conservative Dentistry & Endodontics

Signature of the P.I.

Name of College: Subharti Dental College

Title of the Project: Effect of different acidic beverages on Nanohardness & Surface roughness of contemporary bulk fill

Employee Code of PI:

Duration of the Project: 1 year

ROLE OF MRI IN THE EVALUATION OF SPINAL TRAUMA

Research Proposal Submitted by

DR. PRADEEP BANSAL
Department of Radio-diagnosis & Imaging
Subharti Medical College, Meerut (U.P)

INTRODUCTION

The vertebral column, also called the spinal column, spine, or backbone, in vertebrate animals is the flexible column thathouses the spinal cord extending from neck to tail, made of series of bones, the vertebrae. In human vertebral column, there are 33 vertebrae divided into cervical (C1-C7) (C1-Atlas,C2-Axis), thoracic (T1- T12), lumbar (L1-L5), sacral (S1-S5 fused) and coccyx (3-5 segments).[19]It is a part of the axial skeleton and the most important function of the spine is to protect the spinal cord, which is the nerve supply for the entire body originating in the brain.

Trauma to the spine may cause injuries involving the spinal cord, vertebrae, or both. Spinal trauma is more likely to occur after falling from heights or diving into water, a road traffic accident,Penetrating injuries in the area of the spine, Pelvic fractures, due to sports or any other blunt impact. Trauma to the spine has different severity and prognosis. It may range from asymptomatic to neurological dysfunction to even fatality. Spinal trauma also has a direct effect on the increase in costs and hospitalization as well on the social and economic development of the society[3]

In major trauma patients, the cervical spine is mostly injured. Falls are the most important cause followed by motor vehicle accidents and violent acts.Traumatic spine injury occurs mostly in males in their teens or twenties. More than half of cord injuries occur in the cervical spine region,a third in the thoracic region and the remainder in the lumbo-sacral region. Quadriplegia is one of the most devastating consequences of cervical spine trauma.[4]

To evaluate the spinal trauma, the lesion can be correctly identified by the radiologist and further damage to the patient would be arrested. Injury is said to be acute if it has occurred within 3weeks of diagnosis and thus have to be considered as fresh injuries.They may cause damage at not only one but at many site of the spinal cord.Thus,early detection of the spinal

injury results in betterprognosis.Radio-imaging is one of the most important tools in the diagnosis of spinal injury and helps to start a prompt and correct treatment to patients.[3]

The imaging evaluation of spinal cord injury (SCI) has undergone a remarkable evolution with the development of Magnetic Resonance Imaging. Although plain radiographs, myelographyand computed tomography were once the mainstay of spinal imaging, the MRI has recently become a necessity in the management of SCI. The vertebral column, spinal cord, and adjacent soft tissue structures and neural compression can directly be imaged by MRI. The information provided by MR imaging has radically changed our abilities to access the patient in the emergent period and has altered our understanding of pathophysiology of SCI and its prognosis. With this background, the present study is aimed to review the magnetic resonance characteristics in prospective evaluation of SCI, and to assess the potential impact of MR imaging in the management of spinal axis trauma.[2]

MRI has been playing an increasingly important role in the management of spinal trauma patients due to its increased availability in the emergency settings and its inherently superior contrast resolution .Notably, MRI is the modality of choice for evaluation of soft tissue structures including the intervertebral disc, the ligaments, the epidural space, the blood vessels,the spinal cord and occult osseous injuries. So Imaging plays a critical role in diagnosis of acute spinal trauma and helps in initiating prompt and accurate treatment in these patients[1]The main indications of MRI in spinal trauma include[1]

1. Radiographic and/or CT scan findings suggestive of ligamentous injury, such as prevertebralhematoma,spondylolisthesis, asymmetric disc space widening,facet joint widening or dislocations, and inter-spinous space widening.
2. To look for epidural hematoma or disc herniation before attempting aclosed reduction of cervical facet dislocations.

3. To identify spinal cord abnormalities in patients with impaired neurological status.

4. To exclude clinically suspected ligamentous or occult bony injuries in patients with negative radiographs.

5. To determine the stability of the cervical spine and assess the need for cervical collar in obtunded trauma patients.

6. To differentiate between hemorrhagic and nonhemorrhagic spinal cord injuries for the prognostic significance as the presence of hemorrhagesignificantly worsens the final clinical outcome.

Table: Role of MRI for evaluation of various spinal trauma[1]

Pathologic features	**Role of MRI**
Ligamentous injury	• Higher sensitivity for detection compared to CT. • Complete tear (seen as discontinuity of ligaments) or partial tear (seen as abnormal signal) can be differentiated. • Helpful in guiding management by differentiating stable from unstable injuries.
Disc damages and herniations	• Detection of abnormal disc signal related to traumatic herniations. • Important to diagnose this before closed reduction as undetected disc herniations can cause worsening cord injury
Extra medullary hemorrhage	• MRI shows extent of hematoma to help in surgical planning. • Extradural hematoma is commonly encountered and can lead to cord compression.
Vascular injuries	• Enable detection of arterial injuries, which include an intimal flap, pseudoaneurysm, complete occlusion or active extravasation. • Undetected vascular injuries can cause spinal cord infarctions.
Cord injuries	• Detection of hemorrhagic and non-hemorrhagic cord injuries.

	• This is the single most important role of MRI in spinal trauma evaluation. • Visualized as abnormal cord signal with hemorrhage best seen on gradient recalled echo (GRE) type sequences. • Presence of hemorrhage is the most important poor prognostic factor.
Acute vs old vertebral fracture	• Age-indeterminate fractures identified on radiography and CT can be classified into acute and old fractures based on the presence or absence of bone marrow edema, respectively

AIMS AND OBJECTIVES

1 To evaluate the demographic profile of patients of Spinal Trauma.

2 Role of MRI in evaluation of Spinal Trauma to assess the severity of injury.

3 To analyze the correlation of imaging and clinical findings, if any.

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 50 patients.

Duration of Study : The source of data for this study will be 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 of 2 years, from October 2019 to August 2021.

Inclusion Criteria:

All patients in any age group referred to the radiology department with clinical suspicion of spinal trauma.

Exclusion Criteria:

1. Patients with cardiac pacemakers, ferromagnetic aneurysm clips, other ferromagnetic implants (Ex: cochlear implants), intraocular metallic foreign bodies.
2. Patients with claustrophobia.

METHODOLOGY:

After obtaining clinical history(ANNEXURES-A)relevant clinical examination will be done.

ASIA grading will be done for neurological injury(ANNEXURES-B).

MRI examinations will be done on GE – SignaHDe contour GE 1.5 Tesla Feiloversikt, whole body MR scanner with sense surface coil and then evaluation of M R Imaging finding will be done.

Technique:

Positioning:

Every patient willlay insupine position with quiet breathing. No movement is allowed during examination.

Protocol of **MR imaging**:

Patients included in the study shall be subjected to routine MRI of the spine by various pulse sequences by trained radiographer consisting:

1. Sagittal T1 F
2. Sagittal T2 F
3. Myelo SAG
4. Sagital STIR

5. Axial T1FSE
6. Axial T2 frFS
7. Coronal STIR
8. Axial PD FS
9. Coronal PD F
10. Sagittal PD FS
11. Axial 3D FSPG
12. Sagittal T2 frF
13. Coronal T1 SE
14. Coronal STIR

Slice thickness:5.0/1.0

Matrix :352X256

Number of excitation:4

Field of view:35X35

The findings shall be viewed in the light of complete clinical and radiographic data .

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 'paired t test'.

- Statistical differences between the proportions will tested by Chi square test or Fisher's exact test.
- Pearson correlation coefficient will be used to see the correlation between quantitative variables.

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

ANNEXURE-A

(PROFORMA)

Identification details

Patient Name: Hospital Reg no:

Age: Sex:

Address: Occupation:

Chief complaints:

Duration of complaints:

History of trauma:

Concordant mechanism of injury:

Previous treatment received:

History of Numbness,Tingling,or weakness of extremities:

Bowel or Bladder dysfunction:

Other medical history:

Any other significant history:

HigherFuction:Consciousness,Alertness,Orientation,Speech.

Spine Examination:

Inspection:

From Back:

1.Position of Head:

2.Level of Shoulder:

3.Position of Scapulae:

4.Lateral Margins of the Body:

5.Curvature of spine:

From Front:

1.Chest Symmetry:

2.ASIS Level:

From Side:

1.Curvature of Spine:

2. PSIS Level:

Palpation:

1.Tenderness:

a) Direct:

b)Indirect:

c)Rotatory:

2.Swelling:

3.Wasting & Rigidity:

Movement:

Range:

1. Flexion:
    - Finger floor distance
    - Modified Schober Test
2. Extension:
3. Lateral Flexion:

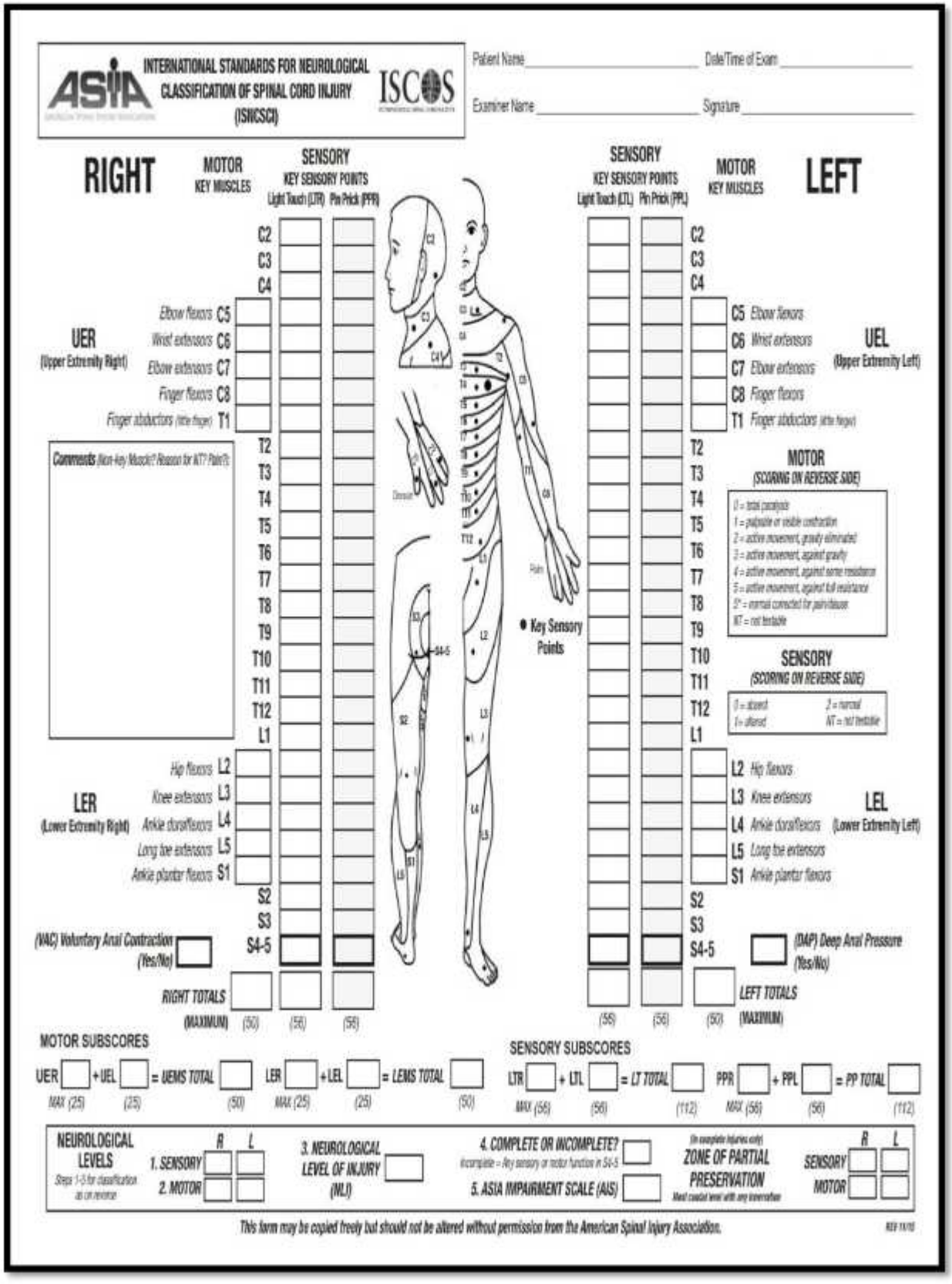
4. Rotation:

REFLEXES:

1. Superficial:
    a) Abdominal:
    b) Cremastric:
    c) Planter Reflex:
2. Deep:
    a) Knee Jerk:
    b) Ankle Jerk:
    c) Tricep:
    d) Bicep:
    e) Supinator:
    f) Clonus:
3. Visceral:
    a) Anal reflex:
    b) Bulbo-Cavernous reflex:

ANNEXURE-B

BROADLY THE NEUROLOGICAL EXAMINATION (MOTOR AND SENSORY) WILL BE DONE AS PER THE ASIA GRADING SYSTEM



Muscle Function Grading

0 = total paralysis

1 = palpable or visible contraction

2 = active movement, full range of motion (ROM) with gravity eliminated

3 = active movement, full ROM against gravity

4 = active movement, full ROM against gravity and moderate resistance in a muscle specific position

5 = normal; active movement, full ROM against gravity and full resistance in a functional muscle position expected from an otherwise unimpaired person

5* = normal; active movement, full ROM against gravity and sufficient resistance to be considered normal if identified inhibiting factors (i.e. pain, disuse) were not present

NT = not testable (i.e. due to immobilization, severe pain such that the patient cannot be graded, amputation of limb, or contracture of > 50% of the normal ROM)

Sensory Grading

0 = Absent

1 = Altered; either decreased/impaired sensation or hypersensitivity

2 = Normal

NT = Not testable

When to Test Non-Key Muscles:

In a patient with an apparent AIS B classification, non-key muscle functions more than 3 levels below the motor level on each side should be tested to most accurately classify the injury (differentiate between AIS B and C).

Movement	Root level
Shoulder: Flexion, extension, abduction, adduction, internal and external rotation **Elbow:** Supination	C5
Elbow: Pronation **Wrist:** Flexion	C6
Finger: Flexion at proximal joint, extension **Thumb:** Flexion, extension and abduction in plane of thumb	C7
Finger: Flexion at MCP joint **Thumb:** Opposition, adduction and abduction perpendicular to palm	C8
Finger: Abduction of the index finger	T1
Hip: Adduction	L2
Hip: External rotation	L3
Hip: Extension, abduction, internal rotation **Knee:** Flexion **Ankle:** Inversion and eversion **Toe:** MP and IP extension	L4
Hallux and Toe: DIP and PIP flexion and abduction	L5
Hallux: Adduction	S1

ASIA Impairment Scale (AIS)

A = Complete. No sensory or motor function is preserved in the sacral segments S4-5.

B = Sensory Incomplete. Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-5 (light touch or pin prick at S4-5 or deep anal pressure), AND no motor function is preserved more than three levels below the motor level on either side of the body.

C = Motor Incomplete. Motor function is preserved at the most caudal sacral segments for voluntary anal contraction (VAC) OR the patient meets the criteria for sensory incomplete status (sensory function preserved at the most caudal sacral segments S4-5) by LT, PP or DAP), and has some sparing of motor function more than three levels below the ipsilateral motor level on either side of the body.
(This includes key or non-key muscle functions to determine motor incomplete status.) For AIS C – less than half of key muscle functions below the single NLI have a muscle grade ≥ 3.

D = Motor Incomplete. Motor incomplete status as defined above, with at least half (half or more) of key muscle functions below the single NLI having a muscle grade ≥ 3.

E = Normal. If sensation and motor function as tested with the ISNCSCI are graded as normal in all segments, and the patient had prior deficits, then the AIS grade is E. Someone without an initial SCI does not receive an AIS grade.

Using ND: To document the sensory, motor and NLI levels, the ASIA Impairment Scale grade, and/or the zone of partial preservation (ZPP) when they are unable to be determined based on the examination results.

ASIA
AMERICAN SPINAL INJURY ASSOCIATION

INTERNATIONAL STANDARDS FOR NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY

ISCOS
INTERNATIONAL SPINAL CORD SOCIETY

Steps in Classification

The following order is recommended for determining the classification of individuals with SCI.

1. Determine sensory levels for right and left sides.
The sensory level is the most caudal, intact dermatome for both pin prick and light touch sensation.

2. Determine motor levels for right and left sides.
Defined by the lowest key muscle function that has a grade of at least 3 (on supine testing), providing the key muscle functions represented by segments above that level are judged to be intact (graded as a 5).
Note: In regions where there is no myotome to test, the motor level is presumed to be the same as the sensory level, if bordered motor function above that level is also normal.

3. Determine the neurological level of injury (NLI)
The refers to the most caudal segment of the cord with intact sensation and antigravity (3 or more) muscle function strength, provided that there is normal (intact) sensory and motor function rostrally respectively.
The NLI is the most cephalad of the sensory and motor levels determined in steps 1 and 2.

4. Determine whether the injury is Complete or Incomplete.
(i.e. absence or presence of sacral sparing)
*If voluntary anal contraction = **No** AND all S4-5 sensory scores = **0** AND deep anal pressure = **No**, then injury is **Complete**.*
*Otherwise, injury is **Incomplete**.*

5. Determine ASIA Impairment Scale (AIS) Grade:

Is injury Complete? If YES, AIS=A and can record ZPP (lowest dermatome or myotome on each side with some preservation)

↓ NO

Is injury Motor Complete? If YES, AIS=B

↓ NO

(No=voluntary anal contraction OR motor function more than three levels below the motor level on a given side, if the patient has sensory incomplete classification)

Are at least half (half or more) of the key muscles below the neurological level of injury graded 3 or better?

NO ↓ AIS=C

YES ↓ AIS=D

If sensation and motor function is normal in all segments, AIS=E
Note: AIS E is used in follow-up testing when an individual with a documented SCI has recovered normal function. If no initial testing no deficits are found, the individual is neurologically intact, the ASIA Impairment Scale does not apply.

NEUROLOGICAL EXAMINATION:

SPECIAL TESTS:

1. Straight Leg Raise Test : For Prolapsed intervertebral disc
2. Femoral Nerve Stretch Test
3. Sciatic Nerve Stretch Test:
    a) Lasegue's Test:
    b) Bragard's Test:

c)Crossed Leg Straight Test:

Clinical diagnosis:

MRI Findings:

General obsevations:

Curvature/Lordosis:

Alignment:

Spinal canal:

Anatomy:

Vertebral observations:

Vertebral marrow:

Posterior neural arch integrity:

Cortical definition:

Endplate definition:

Medullary space:

Interspace observations:

▪Subarachnoid space:

▪Nerve roots:

▪Bilateral sacroiliac joints:

▪Lower spinal cord,Conusmedullaris&caudaequina:

Impression:

CONSENT FORM

Study title:MRI evaluation of Spinal Trauma

Study number _____

Subject initials _____

Date of birth/age _____

Address _____

1) I confirm that I have read and understood the information sheet dated _____ for above study and have had opportunity to ask questions [ ]
2) I understand that my participation in study Is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal right being affected [ ]
3) 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) [ ]
4) I agree to take part in above study [ ]

Signature (or thumb impression) of subject/ legally acceptable _____

Representative signatory name _____ Date _____

Signature of investigator _____ Date _____

Sign of witness _____

Name of witness _____ Date _____

Copy of patient information sheet and duly filled consent form shall be handed over to subject or his/her attendant

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 10.3.2018

Head of Department

Name of Department: Radio-Diognosis

Name of College: Subharti Medical college

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

78% subjects were male, hence there was male preponderence with age group of 31-40 years with compression fracture in 72%. & retropulsion of vertebral Body. Spinal cord oedema was found among 70% with maximum no. of cases having cord oedema >3cm. AIS grade AB, C, D & E was found among 20%, 20%, 16%, 22% and 22% of cases respectively. Sensory & motor loss in 24% & 74% of cases, sensory loss was correspond with level of spinal cord oedema & level of vertebral fracture.

External Support: YOUNKER BUDDHIST SOCIETY AND RESEARCH FOUNDATION.

Name of PI: Dr. Pradeep Bansal (Left) / Dr. D.B. THUKRAL

Name of the Department: Radio-Diognosis

Name of College: Subharti medical college

Title of the Project: ROLE OF MRI IN EVALUATION OF SPINAL TRAUMA

Duration of the Project: 2016/17

Registrar
Swami Vivekanand
Subharti University
MEERUT

"Comparative evaluation of bond strength of resin composite to enamel using different adhesive techniques-An in vitro study"

Research Proposal Submitted

By

Dr. Sachin Gupta

Subharti Dental College

Background & Objective:-

1) To compare and evaluate the bond strength of resin composites to enamel.
2) To compare and evaluate different adhesive techniques.

Materials & Methods:-

Freshly extracted human permanent maxillary central incisors teeth with intact labial surface were obtained. Teeth were decoronated and crowns were embedded in self-curing acrylic resin using teflon ring moulds (3.2mm X 5mm) while ensuring the horizontal orientation of labial surface.

For this study, 70 samples were fabricated and randomly divided into 3 groups:

A) Group 1: Prepared Enamel Surfaces (P) (n=30)

Samples in Group 1 were further distributed randomly into 3 subgroups based on the adhesive technique and resin composite used.

a) **Sub Group PNS** (Nano hybrid resin composite + Self etch) (n=10)
b) **Sub Group PSAC** (Self adhering resin composite) (n=10)
c) **Sub Group PSACS** (Self adhering resin composite + Self etch) (n=10)

B) Group 2: Unprepared Enamel Surfaces (UP) (n=30)

Samples in this group were further distributed randomly into 3 subgroups based on the adhesive technique used.

a) **Sub Group UPNS** (Nano hybrid resin composite+ Self etch) (n=10)
b) **Sub Group UPSAC** (Self adhering resin composite) (n=10)
c) **Sub Group UPSACS** (Self adhering resin composite + Self etch) (n=10)

C) Group 3: Control PNER (Prepared Nano Hybrid Composite + Etch and Rinse) (n=10)

PROTOCOL FOR APPLICATION OF BONDING AGENT:

Each sample of all groups was subjected to a specific bonding protocol to form resin composite cylinder for shear bond strength testing which includes:

a) Application of Etch and Rinse system (Scotch bond Multi-purpose, 3M ESPE):
The enamel surfaces of the samples in **Group 3 (PNER)** were etched using Scotchbond Multipurpose etchant.
b) Application of Self etch system (Adper Easy Bond, 3M ESPE):
Self etch system was used in **4 Sub Groups (PNS, PSACS and UPNS, UPSACS)** for bonding resin composite cylinders to prepared and unprepared enamel surface respectively.
c) No bonding agent was used for samples of **Sub Groups UPSAC and PSAC**.

PROTOCOL FOR FABRICATION OF RESIN COMPOSITE CYLINDERS:

Teflon ring moulds of diameter 3.2 mm and length 5 mm were used for making composite resin cylinders. The ring moulds were stabilized in the center of the enamel labial surface.

a) Fabrication of resin composite cylinder using Nano Hybrid Resin Composite (Filtek Z 250 XT, 3M ESPE):
Nano hybrid resin composite was bonded to the enamel surface of samples in Sub Group PNS, UPNS and Group 3 (Control). The teflon ring moulds were filled incrementally with composite resin (Filtek Z 250 XT) with each single increment of 2 mm with the help of plastic filling instrument (Hu Friedy). Curing of each increment was done from all

sides for 20 sec. The increments were added and cured until the ring mould was completely filled (5 mm in height).

b) Fabrication of resin cylinder using Self Adhering Resin Composite (Dyad Flow, Kerr):
Self adhering composite was bonded to the enamel surface of samples in Sub Groups PSAC, UPSAC, PSACS and UPSACS. Self adhering resin composite (Dyad Flow, Kerr) was dispensed onto the enamel surface into the teflon ring with provided dispensing tip. The teflon ring moulds were filled incrementally with self adhering resin composite (Dyad Flow, Kerr) with each single increment of 2 mm. Curing of each increment was done from all the sides for 20 sec. The increments were added and cured until the ring mould was completely filled (5 mm in height).

PROCEDURE FOR SHEAR BOND STRENGTH TEST:

The samples were mounted on the Universal Testing Machine (Saumya Technologies, UTM-D2) to calculate the shear bond strength (at a cross head speed of 0.5 mm/minute with 250 KgF load) parallel to the machine line of travel.

Result:- On completion of the study and after subjecting the obtained values to statistical analysis following results were obtained:

1) Mean Shear Bond strength values can be arranged in the following order:
PNER > PNS > PSACS > PSAC > UPNS > UPSACS > UPSAC
Control > Prepared > Unprepared
(Group 3)>(Group 1)>(Group 2)
2) Prepared enamel surfaces resulted in higher shear bond strength values for all adhesive strategies as compared to unprepared enamel surfaces.
3) Etch and rinse method (using Scotchbond Multipurpose and Adper Single Bond) resulted in highest shear bond strength values as compared to other adhesive strategies.
4) Prior application of self etch agent (Adper Easy One) resulted in higher shear bond strength values of self adhering composite (Dyad Flow) to both prepared and unprepared enamel surfaces.
5) Direct application of self adhering composite without adhesive resulted in lowest shear bond strength values to both prepared and unprepared enamel surfaces.

Conclusion: - However, the results drawn from this study hold true light of condition and limitations of present study. More studies are needed to be carried out to verify and validate the result of present study.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Date: 30-12-2017

Head of Department

Name of Department: Conservative Dentistry & Endodontics

Name of College: Subharti Dental College

Findings of the project: (Max-100 words): Since prepared enamel surfaces resulted in higher shear bond strength values for all adhesive strategies as compared to unprepared enamel surface, hence, it is advisable to roughen the enamel surface before carrying out any adhesive protocol. Etch & Rinse method resulted in the highest shear bond strength values as compared to other adhesive protocols. In situation of using self adhesive composite has to be used, prior application of etchant & adhesive would increase the shear bond strength on prepared & unprepared enamel surfaces.

External Support: Cyan Amit

Name of PI: Dr. Sachin Gupta

Name of the Department: Conservative Dentistry & Endodontics

Signature of the P.I.

Name of College: Subharti Dental College

Title of the Project: Comparative Evaluation of bond of resin composite to enamel using different adhesive technique - An in vitro study

Employee Code of PI:

Duration of the Project: 1 year

Registrar
Swami Vivekanand
Subharti University
MEERUT

To Evaluate Hepatitis B immune status in Health Care Workers in a Tertiary Care Hospital.

Research Proposal Submitted

By

Dr. Anita Pandey
Department of Microbiology
Subharti Medical College

INTRODUCTION

Hepatitis B is classified as a hepadnavirus. HBV is a blood-borne infection which establishes chronic infections; it is a major factor in the eventual development of liver disease.'The infection presents as an acute or chronic hepatitis with a pathologic effect on liver resulting in self limited or fatal outcomes . Chronic HBV infection remains a significant worldwide cause of liver cirrhosis and hepatocellular carcinoma despite the availability of an effective vaccine.[2]

The prevalence of Hepatitis B carriers varies widely in different countries and India falls in the intermediate group'. For non immune persons, disease transmission from a needle stick exposure is upto 100 times more likely for exposure to hepatitis B envelope antigen(HBeAg) positive blood than to HIV positive blood[4].Health Care Workers (HCWs) have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces or contaminated air.[5] According to WHO, 5.9% of HCWs are exposed annually to blood borne HBV infections which correspond to about 66,000 cases worldwide[6].

Thus, the aim of carrying out the present study is to evaluate Hepatitis B immune status in HCWs in our Hospital. To the best of our knowledge there is limited data available regarding Hepatitis B immunization status in HCWs from this geographical area which has prompted us to carry out this study. The present study has also been planned to serve as a baseline tool to limit the occupational hazard in our hospital setting by motivating health care workers to adopt safe injection practices during handling of blood, blood related products and body fluids.

AIM AND OBJECTIVES

AIM:

To evaluate Hepatitis B immune status in Health Care Workers in a Tertiary CareHospital.

OBJECTIVES:

1. **To find out the immunisation status of health care workers in our hospital.**
2. **To determine the prevalence of Hepatitis B Virus infection in Healthcare Workers.**
3. **To determine the anti HBs titre of all health care workers who are HBs antigen negative.**
4. **To identify non-immune personnel and initiate vaccination and follow-up.**
5. **To identify the non-responders.**

MATERIALS AND METHOD

Study design:A prospective cross-sectional study.

Place of study:Post Graduate Department of Microbiology, Subharti Medical College and associated Chattrapati Shivaji Subharti Hospital(CSSH), Meerut.

Study period:One and a half years.

Study population: All Health Care Workers (HCWs) such asdoctors, nurses, medical students, interns, post graduate students, nursing students, technicians and housekeeping staffs.

- Written informed consent will be obtained from all the subjects (Annexure-la& b)

- The demographic detail such as age, gender, occupation, co-morbidities etc. will be recorded in the Proforma/ participants information sheet (Annexure-II a & b)
- Approval from the institutional ethical and research committee will be obtained before conducting the study.

Inclusion criteria:

- All HCWs irrespective of age and gender
- **Completely vaccinated:** Participants who have received all 3 doses of Hepatitis B vaccination.
- **Incomplete/ partially vaccinated:** Participants who have received only one or two doses of Hepatitis B vaccination.
- Noil-vaccinated: Participants who have not received any dose of Hepatitis B vaccination.
- **Unknown:** Participants who do not know whether they have received the vaccine or they do not know the number of doses received.
- **Booster close vaccinated:** Participants who have taken complete primary vaccination followedby booster dose after 5 years of complete vaccination.

Exclusion criteria:

- HCWs with the past history of jaundice or any other chronic liver disease.
- HCWs with known HBs Ag positive status.
- Pregnant women.

Laboratory diagnosis: The laboratory diagnosis will be carried out as per standard protocols.[15,16]

Sample collection:

Blood samples will be collected in a blood collection tubes (red top vacutainer; plain vial) by trained

medical professional (phlebotomist) using aseptic techniques and transported to the microbiology laboratory immediately.

Sample processing:Serum separation:

1. Whole blood collected in the blood collection tubes with clot activator (red top vacutainer) will be inverted 5 times to facilitate the clotting process.
2. Sample will be allowed to clot for 1 hour at room temperature.
3. Once the clot has formed, sample will be centrifuged for 15 minutes at 10.000 rpm.The serum should be clear, non hemolyzed and non lipaemic.
4. Using a sterile pipette, serum will be aliquoted into labeled vials.

Serum storage: Serum samples will be stored at 2-8° c for upto 7 days or frozen at -20°C or below for upto 30 days

SAMPLE PROCESSING USING VARIOUS TESTS:

A. Screening of all the serum samples for Hepatitis B surface antigen (HBsAg):

Hepatitis B surface antigen (HBsAg) will be detected by rapid immunochromatographictest (AlereTrueline, Alere Medical Pvt. Ltd.)

Test procedure: As per kit literature

1. Test sample (100 pi) will be added to the sample well (S) by using a pipette (or 3-4 drops of sample by using provided sample dropper).
2. Result will be read after 20 minutes.

Interpretation of the test:

1. Negative result: The presence of only control band within the result window indicates a negative result.
2. Positive result: The presence of both bands Test band and Control band ("T" band and "C" band) within the result window.
3. Invalid result: If the control band is not visible within the result window after performing the test, the result is considered invalid. The directions may not have been following correctly of the test may have deteriorated. It is recommended to retest the specimen. HCWs found to be HBs antigen positive will be excluded from the study.

B. Quantitative estimation of anti -HBsAntibody titre by ELISA

All the HBs antigen negative serum samples will be subjected for the estimation of anti- HBs titre by ELISA (DIA.PRO, Diagnostic BioprobesSrl; San Giovanni, Milano Italy.)

Test procedure: As per kit literature.

1. The required number of strips will be placed in the microplate holder. A1 and B1 wells will be left empty for blanking purposes. The other strips will be stored into the bag in presence of the desiccant at 2-8°C, scaled.Then 50 ul Specimen Diluent will be dispensed into all the wells to be used for the test except A1 and B1.
2. 100 ul of all the calibrators, lOOul of control serum in duplicate, and then 100 ul of samples will be pipetted. The control serum will be used to verify that the whole analytical system works as expected. Calibrators, Control serum and samples will be checked that they have been correctly added.
3. The microplate will be incubated at 37°C for 60 min and then washed.

4.100p.l Enzyme Conjugate will be pipetted in all the wells, except A1 and B1;the microplate will be incubated for60 min at +37°C.

5. Thenmicroplate will be washed.

6. 100 plTMB/$H_2$02 mixture will be pipetted into each well, blank wells included. The microplatewill be incubated atroom temperature (18-24°C) for 20 minutes.

7.100 pi Sulphuric Acid will be pipetted into all the wells using thesame pipetting sequence as in step 6 to stop the enzymatic reaction.

The colour intensity will be measured with a microplate reader at 450nm (reading) and at 620-630nm (blanking), blanking the instrument on A1 and B1 wells.

Internal quality control

A validation check is carried out on the controls any time the kit is used in order to verify whether the performances of the assay are as qualified.

Results

If the test will turn out to be valid, the quantitative method an approved curve fitting program will be used to draw the calibration curve from the values obtained by reading at 450nm.Then on the calibration curve then concentration of anti HBsAg antibody will be calculated in samples.

INTERPRETATION OF RESULTS:As per kit literature.

- Samples with a concentration >10 mlU/ml : Immune for Hepatitis B infection
- Samples with a concentration <10 mlU/ml :Non-immune for Hepatitis B infection

MOTIVATION OF HCW, REVACCINATION & FOLLOW UP

- Those HCWs with anti HBs titre <10 mlU/ml will be identified.
- These HCWs will be motivated for initiation of Hepatitis B vaccination (0, 1 and 6

months)

- **The follow up of these HCWs uptol-2 months after the last dose of vaccine will be done.**
- Anti HBs titre will be done on repeat sample for finding out their seroconversion
- Out of these re- vaccinated HCWs the non- responders will be identified.

STATISTICAL ANALYSIS

Statistical analysis of the data will be done by using appropriate test and softwares.

PERFORMA FOR PROJECT COMPLETION REPORT

To,

Head of Department

Date: 08/04/2018

Name of Department: Microbiology

Name of College: Subharti Medical College

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

Health care workers (HCWs) are at risk of acquiring Hepatitis B Virus infection (HBVI). Despite being a vaccine preventable disease, the vaccine "non-responders" are at a constant risk of acquiring infection due to lack of seroconversion. The current study aims to evaluate the Hepatitis B vaccination coverage and status of vaccine non-responders among HCWs in a tertiary care hospital.

Among the 183 participating HCWs, 11(6.01%) who were Hepatitis B surface antigen (HBsAg) positive were excluded from the study. Estimation of anti-HBs titre was determined in HBsAg negative individuals. The HCWs with antibody titre <10mIU/ml (non-response) were identified and revaccinated. Post-vaccination titre in these individuals was reassessed 1-2 months after the last dose of both the vaccination series to look for sero-conversion and finally identify the vaccine non- responders.Individuals who did not seroconvert even after the 2nd series of vaccination were thus labelled as "non-responders".

Overall, 72.67 % HCWs were immune (anti HBs titre ≥10mIU/ml). Male population, age ≥50 years, smokers, history of hospitalisation, previous operations and dental procedures in the past were the predisposing factors identified in non-response HCWs. Sero-conversion was seen in 96% of non- responsive HCWs. A total of 4% HCWs were vaccine "non-responders".

Complete vaccination coverage was low among health care workers. The vaccine nonresponders were identified,counselled and posted at low risk area for their safety. Every health care organizationshould have a mandatory policy to vaccinateall the HCWsirrespective of their vaccination status at the commencement of their joband monitor their post vaccination antibody titre.

External Support: support received from Younker Buddhist Society And Research Foundation

Name of PI: Dr. Anita Pandey, Dr. Mehak Manro

Name of the Department: Microbiology

Name of College: Subharti Medical College

Title of the Project: To Evaluate Hepatitis B Immune Status In Health Care Workers In A Tertiary Care Hospital

Duration of the Project: One year

Dr. Anita Pandey
Professor & Head
Department of Microbiology

Registrar
Swami Vivekanand
Subharti University
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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)