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Betadine Dressing Versus Surgical Spirit Dressing in Prevention of Pin Site Infection among the Patients with External Skeletal Fixators

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ABSTRACT

A quantitative approach and quasi experimental design without control group was under taken in M.K.C.G Medical College and hospital, Berhampur, Ganjam and VSS medical college and hospital, Burla, Sambalpur to compare the effectiveness of betadine dressing versus surgical spirit dressing in prevention of pin site infection among the patients with external skeletal fixators.40 numbers of patients with external skeletal fixatorfrom the orthopaedic department of both the hospitals were selected by non probability convenient sampling technique. Observation check list and Rating scale were used to collect data and collected data were analyzed by using descriptive and inferential statistics. Findings revealed that a significant difference in the level of pin site infection before and after antiseptic dressing in both the experimental group. The result showed that antiseptic pin site care of external skeletal fixator is definite role in reducing severity of pin site infection. It is also revealed that betadin wound dressing is much more effective in prevention of pin site infection among the patients with external fixator.

Keywords*: Betadine dressing, Surgical spirit dressing, pin site infection, external skeletal fixators.*

INTRODUCTION

"Constant attention by a good nurse may be just as important as a major operation by a surgeon."

Dag Hammarskjold

External fixation and limb reconstruction procedure play a vital role inmanagement of fracture and orthopaedic treatment and care, and have a massive physical and psychological impact on the patients. There is a pressing hardin need for research which can drive future practice in this area.

Complementary strategies based on sound research findings are needed to be supplement pin tract care of patient with external fixation pin or wire of external skeletal fixator that causes a breach in the continuity of normal physical barrier against infection and pin tract itself become potential source of harbouring various micro organism. There are many studies on pin tract care have been done earlier on different anti bacterial preparations but yet no definite consensus have been drawn on effectivenessof antiseptic preparation to prevent the pin tract infection. Hence it is intended to undergo study on commonly available antiseptic preparation which are very often used for cleansing of skin prior to any surgical procedure.[1]

Fracture is defined as any break in the bone resulting in loss of its continuity. For proper management of fractures, it is important to diagnose the fracture, its site, whether fresh or old, open or closed, traumatic or pathological and associated with any complications. The management included reduction of fracture, immobilization by plaster application, internal and external fixation.[2]

Pin site infection is a major concern for the orthopaedic nurse managing the patient with a skeletal traction pin or external fixator. Prevention of pin site infection is an important nursing responsibility and pin site care is very much essential to avoid infection.[1-2]

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The main causes of fracture are road traffic accidents, fall, prolonged standing as in policeman, nurse, disease process like tumor, infection etc. Fracture management has received increasing interest over the last 30 years due to availabilityof wide variety of fixator frames, larger and stronger pins, better metals and increased knowledge of techniques.[3]

External fixation is a surgical treatment used to set bone fracturesin alignment which a cast would not allow proper alignment of the fracture. In this kind of reduction, holes are drilled into uninjured areas of bones around the fracture and special bolts or wires are screwed into the holes. Outside the body, a rod or a curved piece of metal with special ball-and-socket joints joins the bolts to make a rigid support. Since the bolts pierce the skin, proper cleaning to prevent infection at the site of surgery must be performed.[4]

The pin reactions are categorized into two groups, major and minor reaction. A major pin reaction is characterized by redness, swelling, tenderness, or purulent drainage that does not improve with lancing of the skin and requires removal of pin for skin improvement where as A minor reaction is characterized by redness, swelling, tenderness or clear drainage that improves with lancing of the skin.[5]

Pinsite care has been defined as any treatment or dressing applied at least once a day to skeletal pins, either skeletal traction or external fixator pins, by nursing personnel.[5]

A cleansing solution is necessary to remove drainage around pinsite, Keeping pinsites free of infection &drainage and clean allows for easy monitoring. A cleaning solution is necessary for the removal of crusting to allow for adequate drainage. Loosely wrapping a gauze bandage around pinsite daily will provide a protective barrier without blocking the flow of drainage and blood supply. The cleaning solutions used for cleaning skeletal pinsites includes surgical spirit, povidone iodine solution, normal saline, soap and water, sterile water and chlorhexidine gluconate.[6]

The problem of deaths and injury, as a result of road traffic accidents, is now acknowledged to be a global phenomenon with authorities.Virtually all developing countries of the world are concerned about the growth in the number of people killed or seriously injured on the roads.[7-9]

The development and severity of pinsite infections probably associated more with the breech in mechanical integrity of the bone interface or pin stability than with the techniques of caring for the pinsite. Diane R Eckhouse- Ekeberget al., (2005) mentioned that providine solutionhas also been used for pin site care.[10]

Today, a standard for pin site care that has been proven to be effective in preventing infection has yet to be identified. There is very little evidence to say that which pinsite care regimen is best to reduce the infection rates. So an attempt is made to findout that which existing practices are better for prophylaxis of pinsite infection cases. Preventing infection of skeletal pinsites of patients with skeletal traction pins or external fixator pins is oneof them in nursing priority. Being nursing personnel, it is a need to find out the most effective protocol to reduce the number of pinsite infection cases. This motivated the researcher to do study on this topic. This study is undertaken to high-lighten the effective protocol in preventing of pin site infection.

Statement of problem

A study to compare the effectiveness of betadine dressing versus surgical spirit dressing in prevention of pin site infection among the patients with external skeletal fixators in selected medical college hospital, odisha.

OBJECTIVES

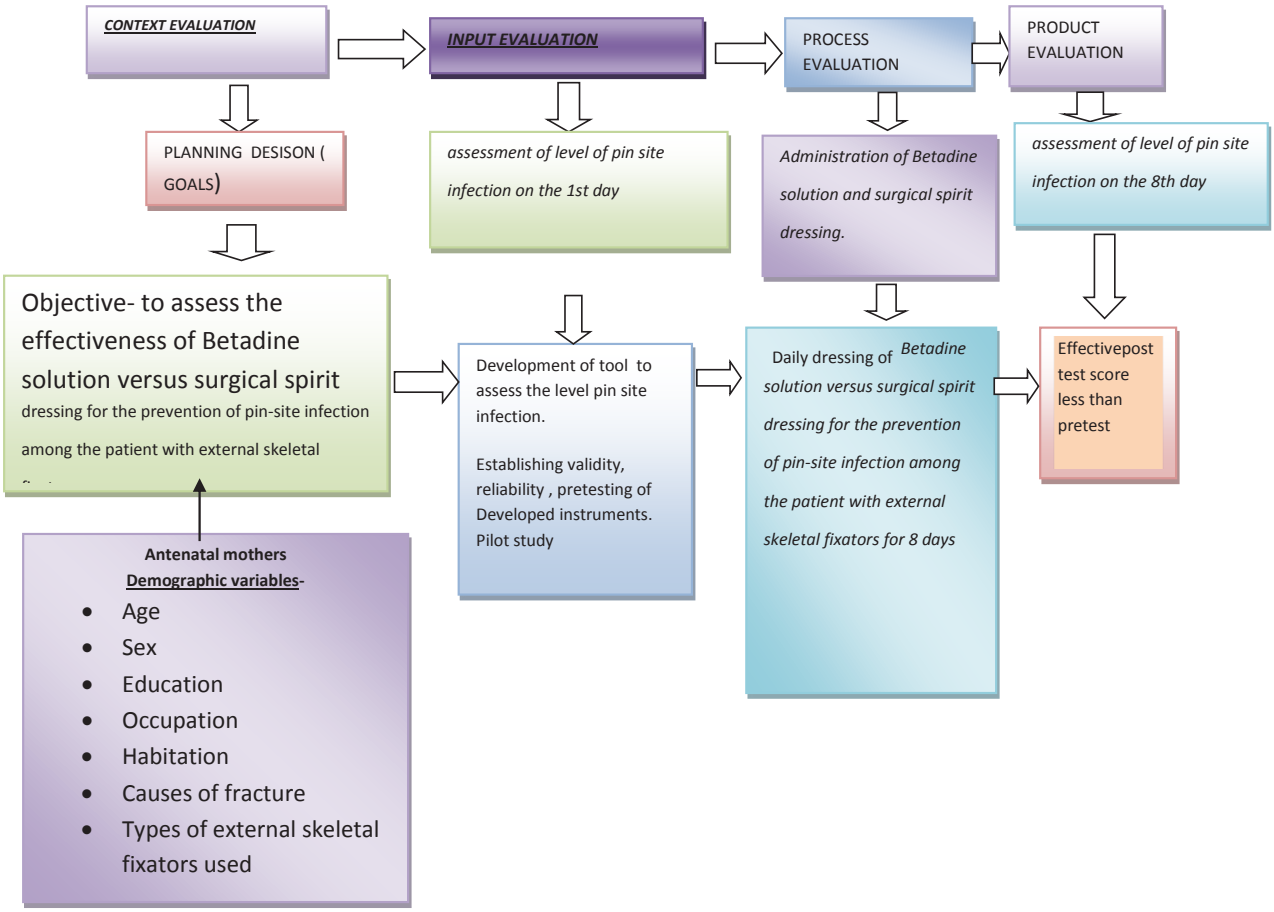
- To assess the severity of pin site infection before and after the application of betadinedressing on the8th day of intervention.
- To assess the severity of pin site infection before and after the application of surgical spirit dressing on the 8th day of intervention.
- To compare the effectiveness of surgical spirit dressing and betadine dressing in terms of prevention of pinsite infection among patients with external skeletal fixators on the 8th day

HYPOTHESIS

H1: There will be a significant difference between betadine dressing and surgical spirit dressing score 8thday of the intervention.

H2: There will be a significant association between pinsite infection assessment scores with their selected

Fig.1:-Conceptual Framework Based On Modified Daniel Stuffle Beams CIPP Model (1971)



(***conceptual framework on level of stress of Antenatal mother based on Modified Stufflebeams CIPP Model 2003***).

demographic variable.

ASSUMPTION

This study assumes that: -

Nurses have got an important role in providing pinsite care.

Pinsite infection can be detected by frequent observation

MATERIALS AND METHOD

Research design :

Evaluative research approach with quasi -experimental research design was used to conduct the study.

Group	Pre-test assessment of pin site infection on 1st day	Manipulation of independent variables	post-test assessment of pin site infection on 8st day
Experimental group I	O_1	X_1	O_8
Experimental group II	O_1	X_2	O_8

KEY

X_1 = Cleaning the pinsite with betadine dressing

X_2 = Cleaning the pinsite with surgical spirit dressing

O_1= pre - assessment of the pin site infection on the 1st day.

O_8= Post assessment of the pinsite infection on the 8th day.

Setting of the study:

The study was conducted in M.K.C.G Medical College and hospital, Berhampur, Ganjam and VSS medical college and hospital, Burla, Sambalpur

Population: All the patients undergone external Sskeletal fixation for various types of fracture requiring pinsite cleaning and dressing were the population for the study.

Sample sizeand Sampling technique: 40 numbers of patients with external skeletal fixator from the orthopaedic department of both the hospitals were selected by non probability convenient sampling technique.Out of which 20 patients were in the experimental group I, and 20 patients were in the experimental group II .

Tool for data collection: Observation checklist and rating scale were used to collect the data.

Content Validity and Reliability of the tool: After having an extensive literature review, a consultation with medical and nursing experts, based on the specific purpose, tool was developed and validated by the experts of various fields.

Inter rater method was used to calculate the reliability of the tool where spearman brown prophecy formula was used and found to be reliable (r=0.8).

Ethical consideration: Prior to data collection permission was obtained from thesuperintendent of M.K.C.G Medical College and hospital, Berhampur, Ganjam and VSS medical college and hospital, Burla, Sambalpur and informed consent was taken from the respondent.

Data collection procedure: The pin site of external fixator was dressed once daily after 48-72 hours of theatre dressing for 7 consecutive day with Betadine solution to experiment group-I and with surgical spirit to experiment group-II and on 8th day pin site was assessed for pin site infection by using observational check list.

Planned for data analysis: Collected data was organized and analyzed by using descriptive and inferential statistics.

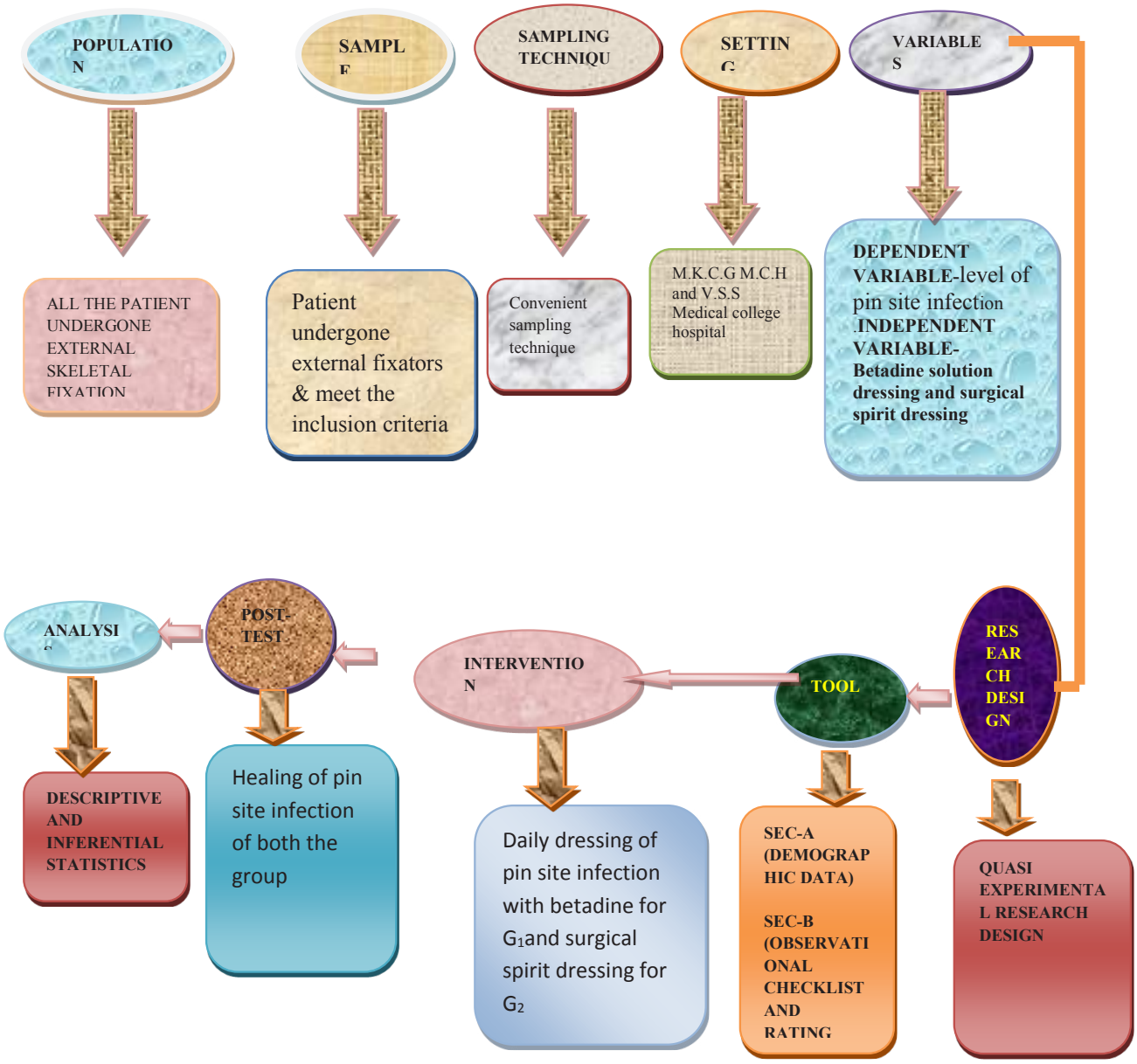


FIG-2: SCHEMATIC PRESENTATION OF RESEARCH DESIGN FOR PRESENT STUDY

FINDINGS

Table:1: Frequency & percentage distribution among patients with external fixators of both the experimental group I & II.

Demographic Variables	Frequency	Percentage
Age		
15-24	3	7.5
25-34	8	20

Cont... **Table:1: Frequency & percentage distribution among patients with external fixators of both the experimental group I & II.**

34-44	8	20
45-54	8	20
55 and above	13	3.5
Sex		
Male	33	82.5
Female	7	17.5
Education		
Illiterate	14	35
Primary education	12	30
Sec. education	13	32.5
Graduate & above	1	2.5
Occupation		
Un employed	4	10
Govt. service	17	42.5
Private service	12	30
Daily wages	7	17.5
Habitation		
Urbans	12	30
Rural	28	70
Causes of fracture		
Road traffic accident	27	67.5
Fall	9	22.5
Violence and others	4	10
Types of external Skeletal Fixators used		
Llizarov external fixator	22	55
LRS external fixator	11	27.5
Mono lateral fixator	7	17.5

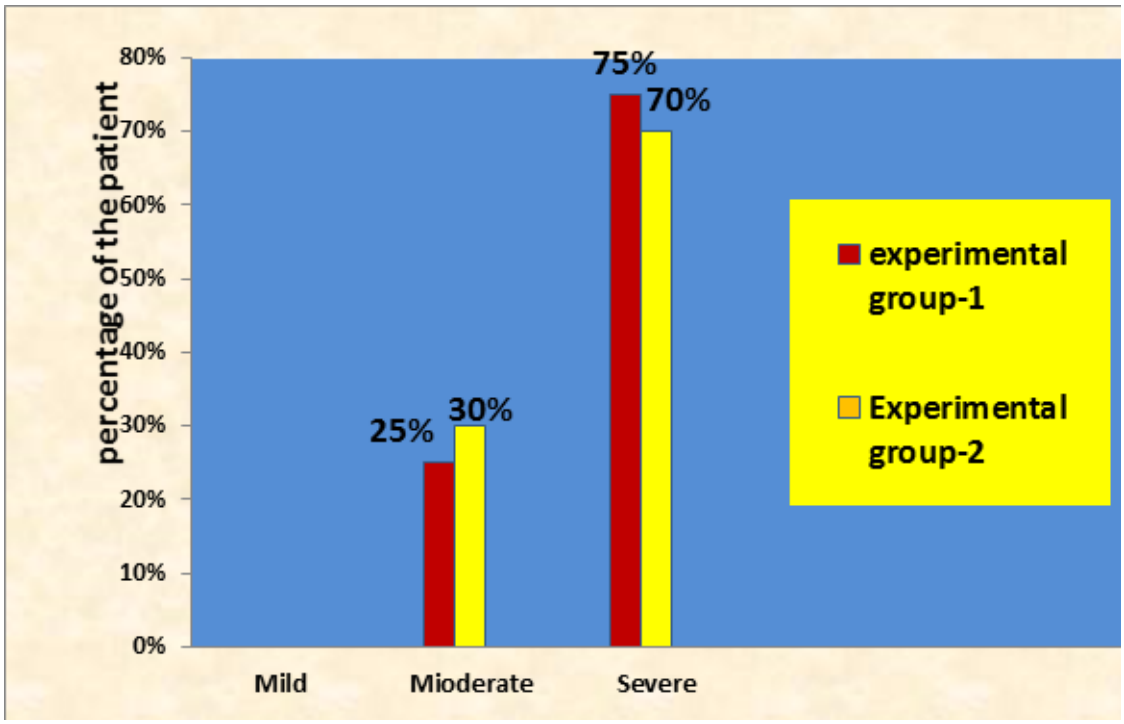


Fig-3: Showing the Severity Of Pin Site Wound Before Antiseptic Dressing

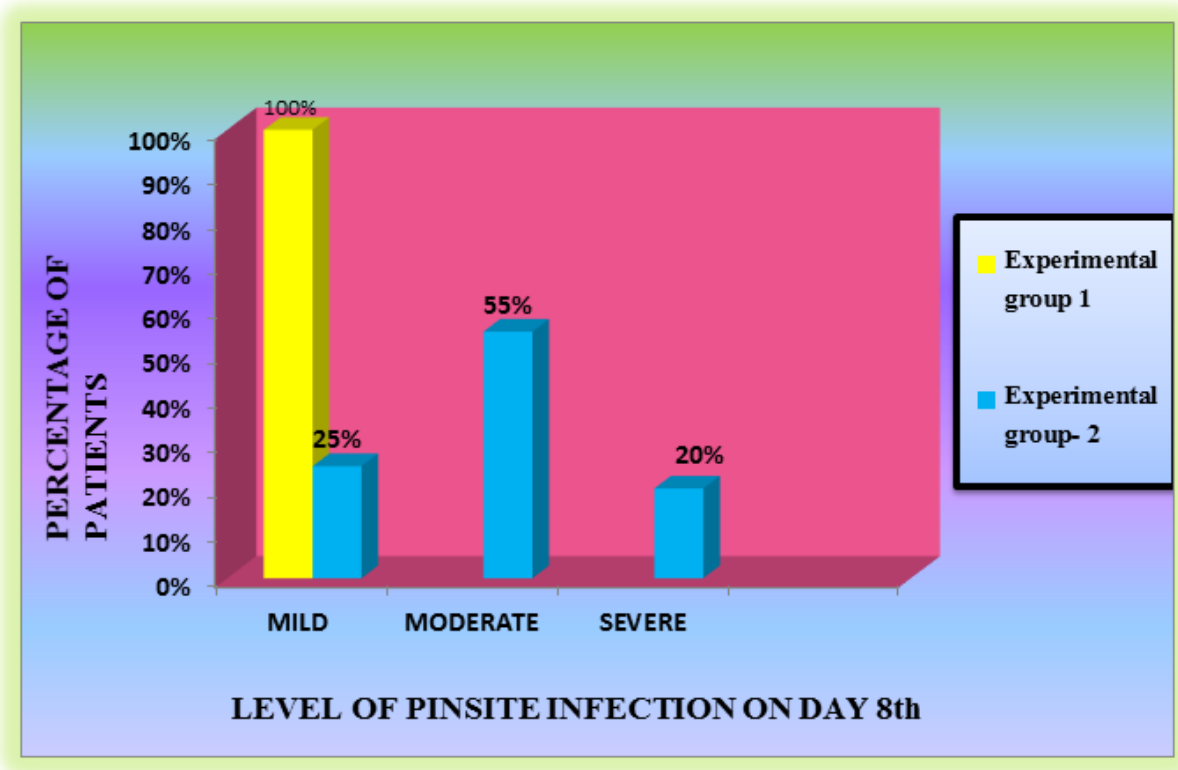


Fig-4: Showing the Severity Of Pin Site Wound after Antiseptic Dressing

Table -2: Comparison of pin site infection score between group I and II after 7 days of daily dressing.

Objective assessment of pin sit infection	After 7 days of dressing	Mean	SD	t- value
Experimental group-1	O_1-O_8	2.4	0.8	13.65
Experimental group-2	O_1-O_8	7.7	2.53	6.45

Unpaired 't'test was calculated to assess the significant difference between pre and post test level of pin site infection which shows highly significant difference of pre test and post test pin site infection in both the betadin dressing and surgical spirit dressing. Hence, the null hypothesis was rejected **(P≤ 0.05)** and statistical hypothesis was accepted in both the Experimental group-1 and experimental group-II.

SUMMARY AND CONCLUSION

From the findings of the present study it was concluded that antiseptic solution dressing is helpful procedure to reduce the severity and complication of infection. Antiseptic dressing like 10% Betadine solution and surgical spirit that are universal and easily available in all hospital setting and is effective in reducing pin site infection of external skeletal fixture which is effective, simple, non-invasive, cost effective method that can be used easily without sophisticated instrument and equipment and side effects as well as extra efforts from the part of any care givers.

The literature is limited with regard to prevention of pin site infection. A small number of studies have been published that guide the orthopaedic surgeon to choosing strategies to reduce the risk of pin site infection.There is no strong evidence to guide choice of dressing type, cleansing regimen, or other aspects of pin site care. There is suggestion that Betadine solution may be superior to saline as a pin site cleansing solution and that daily cleansing with saline is not superior to weekly cleansing. Clinicians should use personal judgement and experience until better evidence is available and, especially in the light of weak evidence, should consider the cost–benefit ratio of any pin site care regimen .[11-12]

Surgeons and nursing staff should adopt a uniform pin care protocol that works for their patients and that can be taught to everyone involved in that patient's care. Using a consistent protocol will help to ensure that the patient is not getting different information from different members of the healthcare team, a common problem that can lead to confusion and loss of confidence. Providing patients with a handout describing the pin site care protocol is an effective way to communicate to home nursing and family members that are involved in the pin site care. Audits of the protocol with a review of the latest studies on pin infection and prevention will allow for updating the protocol and delivering high-quality care.[13-14]

RECOMMENDATIONS

A similar study can be conducted with a very large sample size for wide generalization.

A similar more studiesare needed to be conducted for longer duration to find out the effectivenessof these antiseptic solution.

A similar study can be replicated in any other minor surgical wound as regards to its efficacy in prevention of infection.

Conflict of Interest: None

Source of Funding : Self

Ethical Clearance: Permission was obtained from the ethical committe of the parent institution and Prior to data collection permission was taken from the superintendent of M.K.C.G Medical College and hospital, Berhampur, Ganjam and VSS medical college and hospital, Burla, Sambalpur and informed consent was taken from the respondent.

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