

Effectiveness of Betadine Dressing versus Chlorhexidine Dressing in Terms of Prevention of Pinsite Infections among Patients with External Skeletal Fixators

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Abstract: A study was undertaken to assess the effectiveness of Betadine dressing versus Chlorhexidine dressing in terms of prevention of pinsite infections among patients with External skeletal Fixators in NRI General Hospital, Guntur, Andhrapradesh. Patients were selected by Probability random sampling technique. The conceptual framework of the study was based on Modified Betty Neuman's Model. Data were collected by using Checkett's and Otterburn's grading system of evaluation from 60 patients undergoing External Skeletal fixation. The study revealed that in both Experimental groups the pinsite infection levels are same in preassessment (i.e., 1st day). Whereas in post assessment on 5th day 1.66 ± 0.372 & on 10th day 1.6 ± 0.312 in Betadine dressing group. And in Chlorhexidine dressing group it was 1.33 ± 0.471 on 5th day & 1.833 ± 0.372 on 10th day thus it is inferred that Chlorhexidine dressing was effective in prevention of pinsite infections among patients with External skeletal fixators.

Keywords: Betadine dressing, Chlorhexidine dressing, Pinsite infections, External skeletal Fixators

1. Introduction

Fracture management has received increasing interest over the last 30 years due to wide variety of advancements like Splinting, Manipulation, Amputation, Internal Fixation and External Fixation. The early advocates of External Fixation experienced considerable problems. A long term and invasive nature of External Fixation reported infection rates at the Pinsites. This is undesirable as it can lead to failure of Fixation with consequent loss of alignment of the Fracture.

The growth and multiplication associated with tissue reaction describes the events leading to Pinsite infection. Pinsite infections loosen the Fixation and cause Osteomyelitis. Many regimens are described for Pinsite care. These include regular cleaning with Hydrogen peroxide, Normal saline or clean boiled water, Chlorhexidine, Betadine (Povidone-Iodine) is prescribed post operatively.

Pinsite care is important for patients undergoing limb lengthening; Nurses caring these groups are responsible to prevent Pinsite infection by applying Dressing, timely administration of Antibiotics, proper positioning of the patient, Massaging over the area of Fixation and providing all modalities of treatment. Nurses should also consider the factors which influence the Healing like Dehydration, Personal Hygiene, Nutritious diet, Medications and Patient Education.

2. Statement of the Problem

A Study To Assess the Effectiveness of Betadine Dressing Versus Chlorhexidine Dressing in terms of Prevention of Pinsite infections among patients with External Skeletal

Fixators in a selected hospital, Chinakakani, Guntur district, Andhra Pradesh.

3. Objectives of the Study

1. To assess the level of Pinsite infections before the application of Betadine dressing and Chlorhexidine dressing.
2. To assess the level of Pinsite infections after the application of Betadine dressing and Chlorhexidine dressing on Fifth and Tenth day.
3. To find out the Effectiveness of Betadine dressing and Chlorhexidine dressing in terms of prevention of Pinsite infections among patients with External Skeletal Fixators on the Fifth day and Tenth day.
4. To compare the Effectiveness between Betadine dressing and Chlorhexidine dressing in terms of prevention of Pinsite infections among patients with External Skeletal Fixators.
5. To analyse the relationship between the selected socio demographic variables with the level of Pinsite infections after application of Betadine dressing and Chlorhexidine dressing on Tenth day.
6. To determine the difference of variance between the Betadine dressing and Chlorhexidine dressing in prevention of pin site infections.

4. Hypotheses

H₁: There will be a significant difference between the assessment scores of Pinsite Infection on Fifth and Tenth days among Betadine dressing group and Chlorhexidine dressing group.

H₂: The Mean post assessment scores of Pinsite infection will be significantly higher than the Mean pre assessment scores of Pinsite infection.

H₃: There will be significant difference of Variance between Betadine Dressing and Chlorhexidine Dressing among Experimental group-I and Experimental group-II.

H₄: Relationship will be significant between Mean post assessment scores of Pinsite infection on Tenth day with their selected Socio Demographic variables among both Experimental group-I and Experimental group-II.

Conceptual Framework: The Conceptual Framework adopted for this study was based on modified Betty Neuman's Model.

Research Methodology: This study used a quasi-experimental study design.

Group	Pre-test	Intervention	Post-test
O _{A1}	X _A	O _{A2}	O _{A3}
O _{B1}	X _B	O _{B2}	O _{B3}

O_{A1}: First observation on Pinsite in Experimental group-I

X_A: Betadine dressing for the Pinsite in Experimental group-I for Ten days

O_{A2}: Second observation on pinsite to assess the effectiveness of Betadine dressing on Fifth day

O_{A3}: Third observation on pinsite to assess the effectiveness of Betadine dressing on Tenth day

O_{B1}: First observation on Pinsite in Experimental group-II

X_B: Chlorhexidine dressing for the Pinsite in Experimental group-II for Ten days

O_{B2}: Second observation on pinsite to assess the effectiveness of Chlorhexidine dressing on Fifth day

O_{B3}: Third observation on pinsite to assess the effectiveness of Chlorhexidine dressing on Tenth day

Research Variables

- The independent variable is Betadine Dressing and Chlorhexidine dressing
- The dependent variable is Prevention of Pinsite infection in patients with External skeletal fixators.

Table 1: Unpaired 't' value for the level of pinsite Infections before and after the application of Betadine dressing and Chlorhexidine dressing on Tenth day among Experimental group-I and Experimental group-II
 N=60

S. No	Group	Post assessment in both Experimental groups on Tenth day	Mean (\bar{X})	Standard Deviation (SD)	Unpaired 't' value
1.	Betadinedressing group (N=30)	Post assessment	1.6	0.312	2.041361** (p<0.05) Df=58 P=0.022887
2.	Chlorhexidine dressing group (N=30)	Post assessment	1.833	0.372	

Note: **= Highly significant.

The Independent 't' value for both Experimental groups was 2.041361 which shows there is a significant difference between both the groups; indicating Chlorhexidine

Sample and Sampling technique

In the present study Probability Random Sampling technique was used to select the study subjects for both Experimental groups by using Flip a Coin method. The total study sample was 60 patients undergoing External skeletal fixation.

Data Collection Tool: Checkett's and Otterburn's Grading system of evaluation to assess the Pinsite.

Main study

The main study was conducted in January 2015. The data collected was analyzed using descriptive and inferential statistics.

5. Results

Majority of participants were in the Age group of 29-49 years, Males, with the Education between 1st-5th class, Daily wage workers, Hindus, Married having Monthly Income of Rs Less than Rs.5000/-; had Comminuted Fracture with Illiazarov ring Fixator to the Lower Extremities.

The obtained Mean and Standard Deviation scores of pre assessment in both Experimental groups were 1±0. In post assessment on 5th day it was 1.66±0.372 & on 10th day 1.6±0.312 in Betadine dressing group; And in Chlorhexidine dressing group it was 1.33±0.471 on 5th day & 1.833±0.372 on 10th day.

The paired 't' values obtained for Betadine dressing group on 5th day was 2.408319 and on 10th day was 6.595453 and Chlorhexidine dressing group on 5th day was 3.807887 and on 10th day it was 12.041595, which are significant.

dressing as an effective treatment prevention of pinsite infection.

Table 2: Analysis of variance between the Effectiveness of Betadine dressing and Chlorhexidine dressing among Experimental group-I and Experimental group-II

Variables	Sum of squares	Degree of freedom	Mean squares	F-test
Between groups	0.814	1	0.814	6.909
Within groups	6.836	58	0.118	Df=58 (p<0.05) 0.011
Total	7.650	59		

The Analysis of Variance values obtained for the present studies were 6.909 indicates that significant variance between the Betadine dressing and Chlorhexidine dressing.

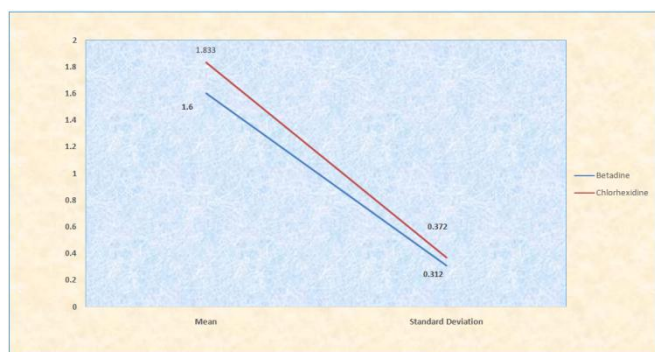


Figure 1: Comparison between the effectiveness of Betadine dressing and Chlorhexidine dressing on 10th day

The Chi-square has shown the association with the variables like Age, Gender, Education, Religion, Marital status, Occupation, Monthly Income of the Family, Type of Fracture, Type of Fixator for the Fracture and Location of Fixation.

6. Implications of the Study

- Nursing students and staff should be trained properly to update their knowledge and skills on prevention of pinsite infections in patients with External Skeletal Fixators.
- Nurse should be skilled enough to assess the pinsite for infection by using Checkett's and Otterburn's Grading system of Evaluation based on that she need to evaluate the effectiveness of surgical dressing.
- The Nurse administrator should take active part in making health policies like developing protocol, procedures and standing orders related to student's education training.
- The result of the study would help the Nurse to enlighten her Nursing practice skills on importance of Effective dressing in prevention of pinsite Infections.

7. Recommendations

Based on the findings of the study the following recommendations are made:

- A Meta-analysis study can be conduct on the different treatment protocols in preventing pinsite Infections in patients with External Skeletal Fixators.
- The randomized controlled trial study can be conducted from gatering the evidences of treatement protocols in prevention of pinsite infection.

- A comparative study can be done between Hydrogen peroxide and Betadine solutions in prevention of pinsite infections.
- An Experimental study can be conducted on practice of dressing in different Hospitals.
- A similar study can be conducted to with large number of samples to assess the effectiveness of treatment protocols.
- A similar study can be conducted to assess the knowledge on staff nurses regarding dressing procedure

8. Limitations

The study limited to the NRI Genaral Hospital, Chinakakani, Guntur District, Andhra Pradesh.

- The study was confined to Orthopedic patients Aged above 20 years and below 55 years.
- The study was further limited to selected Independent varitable.
- The scope of the study was limited because the study was inherent time constraints and leads to M.Sc programme. But this study certainly can form a base for further Investigation.

9. Conclusion

The study was conducted in patients with External Skeletal Fixators to prevent Pinsite infection by application of different treatment protocols of Betadine and Chlorhexidine. The Pinsite infection assessed by using the Checkett's and Otterburn's grading system of Evaluation on 1st, 5th and 10th days. The study concludes that the use of Chlorhexidine is effective in prevention of Pinsite Infections.

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