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4 **A study to assess the effectiveness of pin site care in early healing of pin sites**
5 **among post operative patients in orthopedic ward, Government Doon Medical**
6 **College Hospital Dehradun, Uttarakhand.**

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9 **ABSTRACT:**

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11 **Background:** Pin site infections are common orthopedics problems that may arise
12 from percutaneous pins or wires. The purpose of pin external dressing is to promote
13 early healing around the pin. Assess the healing process and prevent transmission
14 infection of external fixation, dry, sterile, and clean dressing of pin sites to reduce
15 infection of microbes. These complicate the use of skeletal traction pins, percutaneous
16 fracture pinning, and external fixation; the optimal methods to prevent and treat them
17 are controversial. Therefore, pin site care can promote early healing and prevent
18 further risk of infection.

19 **. Objectives:**To evaluate the effectiveness of pin site care regarding early healing
20 among post operative patients in orthopedic ward, Government Doon Medical
21 College Hospital Dehradun.

22 **Material and method:** A quantitative research approach and the research design
23 selected was pre-experimental one group pre-test post-test design to conducted this
24 study. A total of 60 post-operative orthopaedic patients with pin sites from
25 government doon medical college hospital, Dehradun, Uttarakhand were included in
26 the study, by using non probability purposive sampling technique. CHECKETT'S
27 AND OTTER BURN'S GRADING SYSTEM was used to evaluate the effectiveness
28 of pin site care regarding early healing among post operative patients.

29 **Result :** The mean difference of pre test mean of level of infection in patients with pin
30 sites that was 2.25 and post test mean of level of infection in patients with pin sites
31 that was 0.85 and their mean difference is 1.4. P value for the study is 0.001 and that

should be < 0.05 that indicates pin site care was statistically significant. The Tcal (11.73) $> T_{tab}(1.671)$ that indicates that pin site care of post test score was statistically significant. **Conclusion:** It is concluded that pin site care had significant impact on level of infection in orthopaedic patients with pin sites.

INTRODUCTION

Pin site infection is the most common complication. It is documented to be as high as 85% in the Western countries and 71.4% (including major and minor infection) in India. Pin site infections are common orthopedics problems that may arise from percutaneous pins or wires. The purpose of pin site dressing is to promote early healing around the pins. Assess the healing process and prevent transmission of infection at pin sites, dry, sterile, and clean dressing of pins to reduce infection of microbes.

One series reports pin site infections to be the most common complication of pin sites, occurring in up to 100 % of the study group. Most pin site infections are treatable with improved pin site care and a short course of oral antibiotics. Deep tissue infections and osteomyelitis may occur in up to 4 % of cases, which are serious complications. Pin loosening, increased pain, use of pain medications, and delayed mobilization may follow pin removal may be required in severe cases that fail to respond to antibiotic treatment.

India is passing through a major socio demographic, epidemiologic, technological, and media transition. 19.9 road fatalities per 100000 inhabitants per year, 211.8 road fatalities per 100000 motor vehicles in 2011 (**Indian Journal of Orthopaedics and Traumatology, (WHO, 2020).**

Uttarakhand has reported the maximum number of road traffic accidents (67,757) accounting for 15.4% of such accidents in the country. Although Maharashtra had the highest number of registered vehicles in the country, the highest number of deaths due to road accidents during the years were reported in Uttarakhand. (**Indian Journal of Orthopaedics and Traumatology, 2020).**

64 **MATERIAL AND METHODS**

65 This study was conducted in the Government Doon Medical, College, Hospital,
66 Dehradun from 16/june/2023 to 15 july/2023, A pre experimental one group pre-test
67 post-test research design was adopted. Total 60 samples taken for the study through
68 purposive sampling technique. A self-structured questionnaire was used to assess the
69 demographic variables and a standard tool was used to assess the level of pin site
70 infection.

71 **INSTRUMENT/TOOL**

72 The purpose of the study was to assess the effectiveness of pin site care by assessing
73 the level of pin site infection so Checketts–Otterburn grading system is one of the
74 most commonly employed in the literature for the study.

75 **TOOL-1 : SELF STRUCTURED TOOL FOR SOCIO DEMOGRAPHIC**
76 **VARIABLES.**

77 It includes the socio demographic variables such as age in years, gender, family
78 income per month, cause of injury, dietary habits, host factors present and physical
79 activity.

80 **TOOL-2: CHECKETT'S AND OTTER BURN'S GRADING SYSTEM**

81 It describes seven grades of infection based on clinical, radiological, and mechanical
82 factors and taking into consideration response to treatment while at the same time
83 providing management recommendations. The classification has grading system with
84 two to three characteristics in each. The authors further differentiate between the first
85 three stages as minor infections and the last three as major infection that can be
86 reduced to the extent of no infection with grade 0 by proper cleansing and dressing
87 techniques routinely with normal saline and betadine solution.

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90 **STATISTICAL ANALYSIS**

91 The data was analysed using both descriptive and inferential statistics. It includes the
92 frequency and percentage distribution of demographic variables and paired t test and
93 chi square test to find out the association.

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96 **Table1.Frequency and percentage distribution of patients with pin sites**
97 **according to socio demographic variables.**

98 **N=60**

S. No.	Demographic variables	Categories	Frequency (f)	Percentage%
1.	Age (years)	➤ 15-25	13	21.6
		➤ 25-35	9	15
		➤ 35-45	17	28.3
		➤ 45-55	21	35
2.	Gender	➤ Male	44	73.3
		➤ Female	16	26.6
3.	Family income per month (Rs)	➤ 5000-15000	10	16.6
		➤ 15001-25000	21	35
		➤ 25001-35000	27	45
		➤ >35000	2	3.3
4.	Cause of injury	➤ Road traffic accident	29	48.3
		➤ Fall	13	21.6
		➤ Abuse or assault	7	11.6
		➤ Any object related	11	18.3
5.	Dietary habits	➤ Vegetarian	18	30
		➤ Non vegetarian	31	51.6
		➤ Both	11	18.3
6.	Host factors present	➤ Smoking	21	35
		➤ Anemia	13	21.6
		➤ Immunodeficiency	4	6.6
		➤ No host factors	22	36.6
7.	Physical activity	➤ Mild	8	13.3
		➤ Moderate	27	43.3
		➤ Vigorous	21	31.6
		➤ No activity	4	11.6

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102 **Table 2. Frequency and percentage distribution of pre test and post test score of**
 103 **evel of infection among patient with pin site at orthopedic ward according to**
 104 **CHECKETTS-OTTERBURN GRADING SYSTEM OF PIN SITE**
 105 **INFECTION.**

Grade of Infection	Pretest		Post test	
	Frequency (f)	Percent (%)	Frequency (f)	Percent (%)
GRADE 0	5	8.3	29	48.3
GRADE I	11	18.3	16	26.6
GRADE II	19	31.6	10	16.6
GRADE III	15	25	5	8.3
GRADE IV	9	15	0	0
GRADE V	1	1.6	0	0
GRADE VI	0	0	0	0

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107 **Table 3. SCORING KEY OF PATIENTS WITH PIN SITES ACCORDING**
 108 **TOCHECKETTS -OTTERBURN GRADING SYSTEM**

Level of Infection	GRADE	Pretest		Post test	
		Frequency	Percent(%)	Frequency	Percent(%)
No infection	0	5	8.3	29	48.3
Minor infection	I-III	45	75	31	51.6
Major infection	IV-VI	10	16.6	0	0

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117 **Table 3. Effectiveness of pin site care among post operative patients in**
 118 **orthopaedic ward before and after intervention on level of infection.**

Variables	Pretest (mean ± SD)	Posttest (mean ± SD)	Mean difference	Paired t test	DF	P- value	Result
Level of infection	2.25 ± 1.21	0.85± 0.98	1.4	11.73	59	0.001	Significant

119 * The hypothesis is tested at the level of $p \leq 0.05$

120 Table 3 depicts the mean difference of pre test mean of level of infection in patients
 121 with pin sites that was 2.25 and post test mean of level of infection in patients with
 122 pin sites that was 0.85 and their mean difference is 1.4 .

123 p value for the study is 0.001 and that should be < 0.05 that indicates pin site care was
 124 statistically significant. The $T_{cal} (11.73) > T_{tab} (1.671)$ that was calculated by manual
 125 and SPSS software that indicates that pin site care of post test score was statistically
 126 significant. Hence the hypothesis H1 is accepted.

127 **DISCUSSION**

128 The mean difference of pre test mean of level of infection in patients with pin sites
 129 was 2.25 and post test mean of level of infection in patients with pin sites was 0.85
 130 and the mean difference of pre test level of healing and post test level of healing is 1.4
 131 . p value for the study is 0.001 and that should be < 0.05 that indicates pin site care
 132 was statistically significant. The $T_{cal} (11.73) > T_{tab} (1.671)$ that was calculated by
 133 manual and SPSS software that indicates that pin site care of post test score was
 134 statistically significant

135 This study supported by Sonali Banerjee, et al (2016) as a quasi experimental had
 136 undertaken in the selected wards of Nehru Hospital, PGIMER, Chandigarh. Twenty
 137 seven patients with 184 pin sites were studied during January-February 2016 and
 138 randomized into experimental groups patients cleaning pin site with 3% hydrogen
 139 peroxide and with betadine dressing. Checketts and Otterburn's definition was
 140 adopted to define pin site infection. On 7th day of intervention, 2(2.1%) pin sites had
 141 grade-II infection when treated .Results revealed that 38.4% pin sites had grade-I
 142 infection , 7% had grade-II and 4.6% had grade -III infection.

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144 **CONCLUSION**

145 Pin site care is a dressing procedure done to increase the healing ratio of patients with
146 pin sites and reduce the incidence of infection in post operative orthopaedic patients
147 undergoing treatment with pin sites. The present study had statistically proven that the
148 intervention of pin site care was effective on pin sites in early healing of patients with
149 pin sites.

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