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A Comparative Study to Assess the Effectiveness of Warm Compress versus NaCl Compress in Relieving Phlebitis among Patients with IV Cannulation Admitted at Selected Hospitals of Himachal Pradesh

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Abstract: ***Background: Intravenous therapy although one of the most commonly performed procedures in hospitalized patients. The occurrence of infusion phlebitis is common for patients with IV infusion therapy. Infusion phlebitis is defined as the acute inflammation of the vein directly linked to the presence of an IV access device. The aim of the present study was to evaluate effectiveness of Warm Compress versus NaCl Compress in relieving phlebitis among patients with IV cannulation. Objective: to assess the degree of phlebitis, to assess effect of warm compress and NaCl compress and to compare the effectiveness between warm compress and NaCl compress in reducing phlebitis using Jackson's visual infusion phlebitis scale. Methodology: Quasi experimental comparative study was conducted in selected wards of Deen Dyal Upadhyay Zonal Hospital at Shimla. Sample of 60 patients were selected using non probability convenient sampling technique. Pre-test and post test was conducted and same day, warm compress and Nacl compress were administered for three days. Result: The findings of the study revealed that the pre test and post test phlebitis score in warm compress application and NaCl compress application is significance. The study shows that there was significant reduction in intravenous cannulation induce phlebitis after application of warm compress (mean value 2.53, S.D. 0.507and in post test score mean value 0.23, S.D. 0.568). The mean difference in pre and post test score was 2.30, P value (0.0000). This difference is statistically significant. And in NaCl compress (mean value 2.53, S.D. 0.507 and in post test score mean value 0.30, S.D. 0.596). The mean difference in pre and post test score was 2.23, P value (0.0000). This difference is statistically significant. But comparing to these two intervention warm compress is more effective than NaCl compress. GROUP I and GROUP II pre test score mean difference is 0.00, p value (1.0000) and in group I and GROUP II post test score the mean difference is 0.07, P value (0.6591). This difference is statistically not significant. Statistical significance was calculated by using unpaired 't' test. The results were Not-Significant in both the groups.***

Keywords: Assess, Effectiveness, phlebitis

1. Introduction

Intravenous technology was derived in 1831 by Dr Thomas Latta of Leith. In 1930 it was further developed by Hirschfeld, Hyman and Wanger. Among healthcare providers knowledge and skills regarding intravenous therapy commute greatly. With the help of theory and job practice iv starting skills can be developed among health care provider. Intravenous infusion is known as drips. This is used to administered blood, to correct fluid electrolyte imbalance, for administration of medication and for fluid replacement. This is the fastest method to administered medication in the body.[1] A common problem encountered during IV therapy is the phlebitis, i.e. the inflammation of the venous wall near the point of entry of the cannula into the veins. The patients who are on cytotoxic drugs, hyper osmolar agents and vaso active drugs are more prone to phlebitis.[2] The Infusion Nurses Society National standards of practice (Australia) stated that a nurse who administers IV medication or fluid she must know its appropriate interventions to be taken before starting the infusion and its adverse effects. [3]

Objectives

a) To assess the degree of phlebitis among patients with IV cannulation
b) To determine the effect of warm compress in reducing phlebitis using Jackson's visual infusion phlebitis scale.
c) To determine the effect of NaCl compress in reducing phlebitis using Jackson's visual infusion phlebitis scale.
d) To compare the effectiveness between warm compress and NaCl compress in reducing phlebitis.
e) To find association between post-test score of phlebitis with selected demographic and clinical variables**.**

2. Methodology

A quasi-experimental (two group pre-test post-test) design was used and data was collected from 60 patients with peripheral intravenous cannula induced phlebitis in medical and surgical wards, who were available at the time of study and willing to participate. The study was conducted in Deen Dyal Upadhyay Zonal Hospital Shimla.

Non-probability convenient sampling technique was used and Jackson Visual infusion phlebitis scale used to assess the severity of intravenous infusion induced phlebitis.The tool comprised of two sections: Section A consist of two parts that is socio demographic variables like, age, gender, occupation, and clinical variables includes site of intravenous cannula , size of peripheral intravenous cannula and duration of peripheral intravenous cannula, medication administered through peripheral intravenous cannula, and

fluid administered through peripheral intravenous cannula. Section B Jackson Visual infusion phlebitis scale used in this study to assess the severity of intravenous infusion induced phlebitis.

Content validity determined by experts‟ opinion in the field of nursing and medicine. The Standard Visual Infusion Score Scale, and demographic variables and clinical variables were given to seven experts in the field of Nursing and Medical specialist for content validity. Reliability of the tool was assessed by using split half method. After pilot study it was assessed using interrater method. Calculated Correlation coefficient r value is 0.74 (phlebitis). Formal permission was approved by the ethical and research committee of the institute. Permission for the study was obtained from the concerned authority of Deen Dyal Upadhyay Zonal Hospital Shimla.

To ensure the validity of tool, it was submitted to 10 experts. The reliability of tool was assessed by using test-retest method and was calculated by Karl Pearson correlation coefficient. Where 'r' value is 0.87.

Ethical approval was taken from Director of Health Services, Shimla, Himachal Pradesh to conduct the research study. Written and informed consent was obtained from the subjects before data collection and assurance was given and maintained regarding confidentiality of results.

3. Results

Demographic profile and Clinical profile of the subjects in the Group-I (warm compress application) and Group-II (NaCl compress application). In considering the age wise distribution of subjects Group-I revealed the major finding that 27% of patients were between 21-30 years and 37% in group- II respectively. In considering the site of intravenous cannula wise distribution of subjects Group-I revealed the major finding that 63% subjects had infusion in hand and 77% in group- II respectively. In considering the size of peripheral intravenous cannula wise distribution of subjects Group-I revealed the major finding that 80% subjects had infusion through 20 gauze cannula and 77% in group- II respectively. In considering the duration of peripheral intravenous cannula wise distribution of subjects Group-I revealed the major finding that 50% subjects had 48-72 hours duration of peripheral intravenous cannula and 47% subjects had 24-48 hours duration of peripheral intravenous cannula in group- II. In considering the type of intravenous fluid administered wise distribution of subjects Group-I revealed the major finding that 63% were isotonic and 83% in group- II respectively.

Degree of phlebitis before the application of warm compress

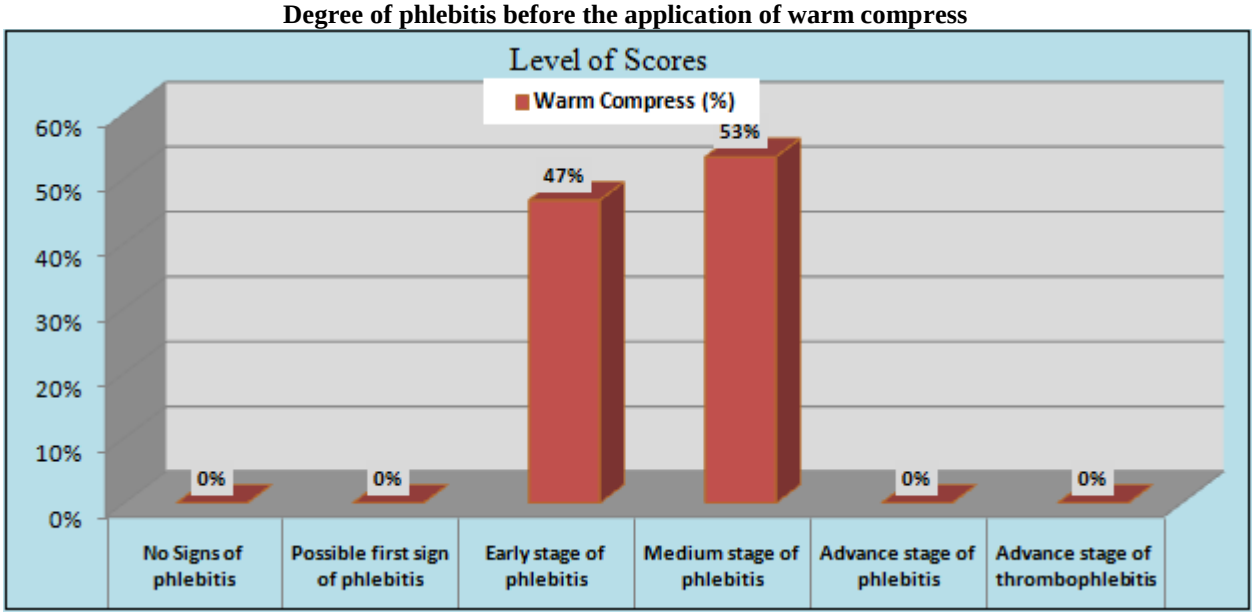

Figure 1: Diagram representing frequency and percentage wise distribution of subjects in group I

Figure 1: depicts that 16(53%) subjects had medium stage of phlebitis and only 14(47%) subjects had early stage of phlebitis, in GROUP I. It revealed that majority of subjects had medium stage of phlebitis in groups I.

Table 1: Mean, SD and mean % wise distribution of subjects in pre test score before the application of warm compress

PRE TEST OF GROUP I			
No. of subjects	Mean	SD	Mean %
30	2.53	0.507	84.3

Interpretation:
Table 1 depicts that phlebitis score for pre test in group I (N=30) the mean value is 2.53, S.D is 0.507 and mean % is 84.3.

Degree of phlebitis after the application of warm compress

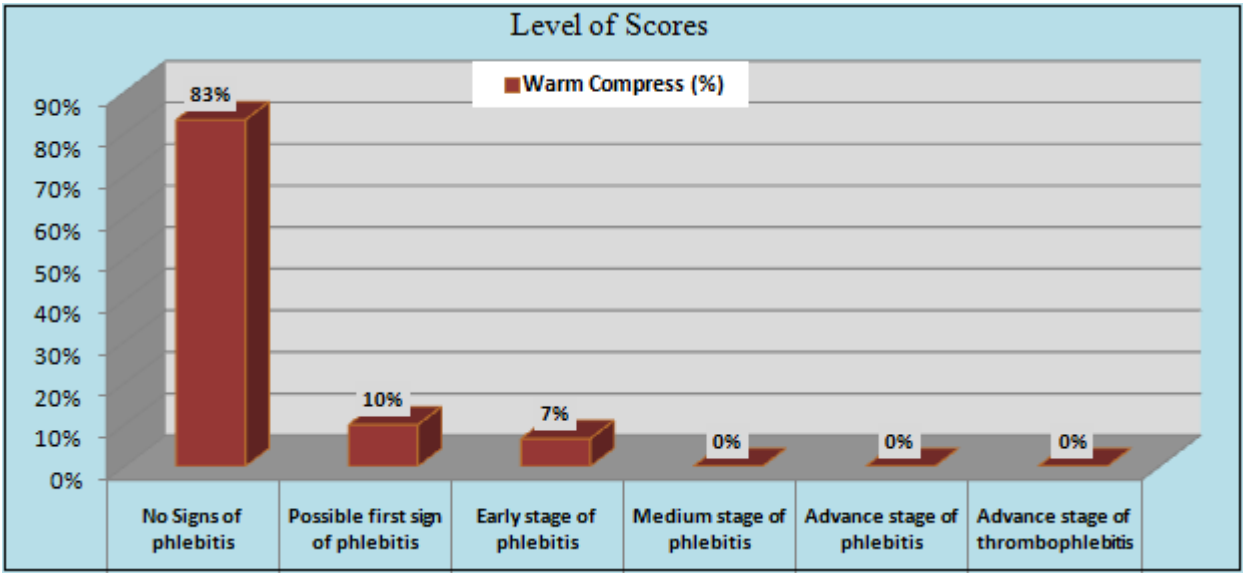

Figure 2: Diagram representing frequency and percentage wise distribution of subjects in group I after application of warm compress Figure 2 depicts that in GROUP I post test score of phlebitis majority of subjects belongs to no sign of phlebitis i.e.25 (83%) , possible first sign of phlebitis 3(10%) and early stage of phlebitis 2(7%) as compared to pre test score of phlebitis.

Table 2: Effectiveness of warm compress on intravenous cannulation induced phlebitis, N=30

No. of subjects	PRE TEST OF GROUP I			POST TEST OF GROUP I			Mean % Difference
	Mean	SD	Mean %	Mean	SD	Mean %	
30	2.53	0.507	84.3	0.23	0.568	7.6	76.7

Interpretation:
Table 2 depicts that phlebitis score for post test in group I (N=30) the mean value is 0.23, S.D is 0.568 and mean % is 7.6 as compared to the pre test score in group I (N=30) the mean value is 2.53, S.D is 0.507 and mean % is 84.3. In GROUP I there is reduction in the phlebitis score from 84.3% to 7.6% and the mean difference between pre and post test score was 76.7%.

Degree of phlebitis before the application of NaCl compress

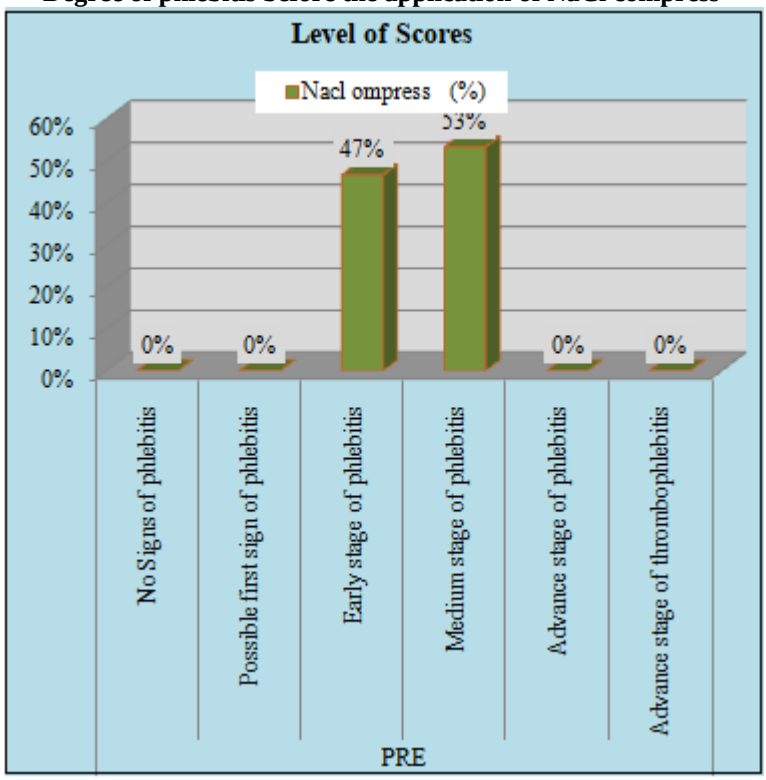

Figure 3: Diagram representing frequency and percentage wise distribution of subjects in group II

Figure 3: depicts that in GROUP II 16(53%) subjects had medium stage of phlebitis, 14(47%) patients had early stage of phlebitis. It revealed that majority of subjects had medium stage of phlebitis in GROUP II.

Table 3: Mean, SD and mean % wise distribution of subjects in pre test score before the application of NaCl compress

N=30

PRE TEST OF GROUP II			
No. of subjects	Mean	SD	Mean %
30	2.53	0.507	84.3

Interpretation

Table 3: depicts that phlebitis score for post test in group II (N=30) the mean value is 2.53, S.D is 0.507 and mean % is 84.3

Degree of phlebitis after the application of NaCl compress

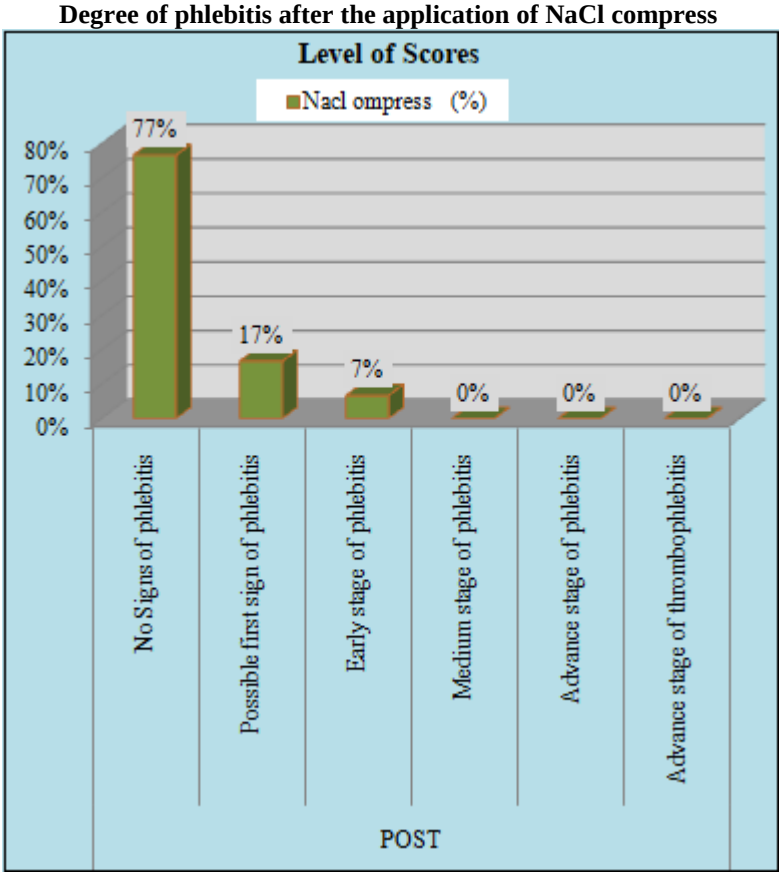

Figure 4: Diagram representing frequency and percentage wise distribution of subjects in group II

Fig 4: depicts that in GROUP II post test score of phlebitis majority of subjects belongs to no sign of phlebitis i.e.23 (77%) , possible first sign of phlebitis 5(17%) and early stage of phlebitis 2(7%) as compared to pre test score of phlebitis

Table 4: Effectiveness of NaCl compress on intravenous cannulation induced phlebitis, N=30

No. of subjects	Pre Test of Group II			Post Test of Group II			Mean % difference
	Mean	SD	Mean %	Mean	SD	Mean %	
30	2.53	0.507	84.3	0.30	0.596	10	**74.3**

Interpretation

Table 4: depicts that phlebitis score for post test in group II (N=30) the mean value is 0.30, S.D is 0.596 and mean % is 10 as compared to the pre test score in group II (N=30) the mean value is 2.53, S.D is 0.507 and mean % is 84.3. In GROUP II there was reduction in the phlebitis score from 84.3% to 10% and the mean difference between pre and post test score was 74.3%.

Table 5: Comparison of effectiveness between Group I and Group II (paired t test), N=60

Paired T Test	Group A		Group B	
	SCORE		**SCORE**	
	PRE	POST	PRE	POST
Mean	2.53	0.23	2.53	0.30
S.D.	0.507	0.568	0.507	0.596
Number	30	30	30	30
Mean Difference	2.30		2.23	
Paired T Test	21.138		19.539	
P value	0.0000		0.0000	
Table Value at 0.05	2.05		2.05	
Result	**Significant**		**Significant**	

Group I * Significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Group II * Significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table 5: shows that in group I pre test score mean value 2.53, S.D. 0.507and in post test score mean value 0.23, S.D. 0.568. The mean difference in pre and post test score was 2.30, P value (0.0000). This difference was statistically significant. Statistical significance was calculated by using paired 't'test. Hence the result was significant.

Group II shows that in pre test mean value 2.53, S.D. 0.507 and in post test mean value 0.30, S.D. 0.596. The mean difference in pre and post test score was 2.23, P value (0.0000). This difference was statistically significant. Statistical significance was calculated by using paired 't'test. Hence the result was significant.

Comparison of effectiveness between group I and group II (unpaired t test)

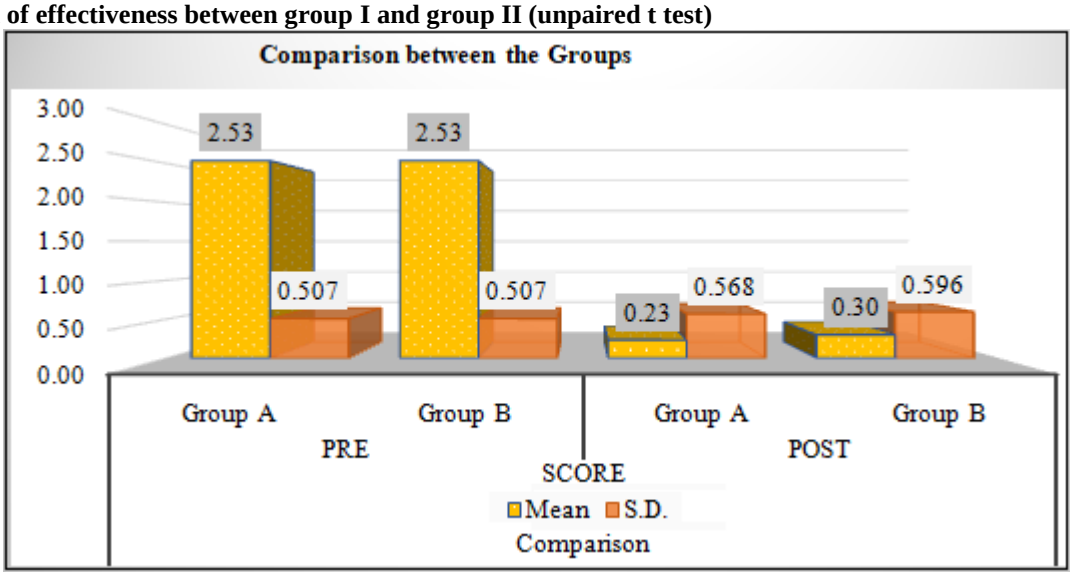

Figure 5: Diagram representing comparison of pre and post test phlebitis score between the group I and group II

Figure 5: shows that in GROUP I and GROUP II pre test score mean difference is 0.00, p value (1.0000) and in group I and GROUP II post test score the mean difference is 0.07, P value (0.6591). This difference is statistically not significant. Statistical significance was calculated by using unpaired 't'test. The results were Not-Significant in both the groups**.**

4. Conclusion

This intervention was found to be, the warm application is effective in intravenous phlebitis comparing to NaCl aplication, but it needs more nursing practice and supervision to improve the quality of care**.**

5. Future Scope

Nursing Education

- This study enhances the nursing students to acquire knowledge in complications and management of intravenous phlebitis.
- This study enhances the student to think comprehensively in planning her/his intervention in managing the client with phlebitis.
- This study provokes critical thinking of the student.
- This study enables the students to compare the other possible ways of managing.
- This study arouses motivation to the student to intelligibility care for client on intravenous infusion.

Nursing Practice

The findings of the study will help the nurse in following ways:

- Early identification and prevention of the complication of intravenous infusion.
- As the application has no adverse effects, the nurse can apply it without doctors orders, if need.
- As the warm compress and NaCl compress has smoothening effect, patients are more comfortable.

References

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