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Original Research Article

A Study to Assess the Risk Factors of Developing Thrombophlebitis among Children Admitted in Paediatric Ward in a Selected Hospital at Puducherry

P. Sumathy[1], Mr. Finny[2]

[1]Professor & HOD, Department of Child Health Nursing, [2]Lecturer, Department of Medical Surgical Nursing, Kasturba Gandhi Nursing College, Sri Balaji Vidyapeeth, Puducherry 607 403,

Corresponding Author: P. Sumathy

ABSTRACT

The insertion of IV cannula for IV fluids and medication is the most common procedure among hospitalized children. Frequent percutaneous intravenous catheter complication is thrombophlebitis that is inflammation of wall of vein due to thrombus. Therefore early detection of complication and removal of percutaneous intravenous catheter is crucial.

Objectives:

- To assess the risk factors of developing thrombophlebitis among children with IV.
- To assess the incidence of thrombophlebitis among children with IV cannula.
- To predict the factors leading to development of thrombophlebitis among children.

Methodology: The study design was Non experimental descriptive design. The study was conducted in Paediatric ward, with a sample size of 40 and the sampling technique adopted was purposive sampling technique. The tools consisted of two parts i.e., Demographic variables/ risk factors affecting the development of thrombophlebitis and Visual Infusion Phlebitis scale to assess the incidence of developing thrombophlebitis. The risk factors that were assessed included site of cannula, size of cannula, type of drugs, duration of infusion, type of infusion, use of restraints etc. The results revealed that 9 out of 40 samples developed Grade 1 thrombophlebitis while other samples did not develop thrombophlebitis. The type of drug used was directly proportionate to the development of phlebitis and this was statistically significant ($P<0.01$). The use of antibiotics was found to be significantly influencing the development of thrombophlebitis than the use of multivitamins. The other factors did not have any significant impact in the development of phlebitis.

Conclusion: Many children in hospital require PVC as part of their medical management and care. A recognised associated risk factor is phlebitis. Nurses are well placed to assess for the presence of phlebitis and act accordingly. By observing good practice both during and after peripheral catheter insertion, complication rates of phlebitis can be reduced and patient care improved.

Key words: Thrombophlebitis, Children, Risk factors, Percutaneous intravenous catheter.

INTRODUCTION

The insertion of a peripheral intravenous cannula for IV fluids and medications is the most common procedure among hospitalized children. [(1)] Frequent percutaneous intravenous catheter complication is thrombophlebitis that is inflammation of wall of vein due to thrombus, which may be mechanical, chemical, bacterial in origin. It causes a

cascade of unwelcome re-percussion significant pain, failure of percutaneous intravenous catheter interruption of prescribed therapy and requirements for insertion of a new percutaneous intra venous catheter with associated increased equipment cost and staff time. Therefore early detection of complication and removal of percutaneous intra venous catheter is crucial. [(2)]

It may occur during catheterization or up to 48 hours after removal. It is common in infancy and childhood. The aetiology and factors are influenced by age of child, site of infusion, infusion hours, infusion pump, change of dressing, size of IV cannula. [(3)] The study helps to identify the awareness about some of the major factors which contribute to the development of Thrombophlebitis.

The researcher was interested to find out the risk factors of developing thrombophlebitis among children admitted in the wards so that appropriate nursing interventions could be carried out at the appropriate time.

STATEMENT OF THE PROBLEM

A Study to Assess the Risk Factors of Developing Thrombophlebitis among Children admitted in Paediatric Ward in a Selected Hospital at Puducherry.

OBJECTIVES:

- To assess the risk factors of thrombophlebitis among children with IV cannula.
- To assess the incidence of thrombophlebitis among children.
- To predict the factors leading to the development of thrombophlebitis among children with IV cannula.

METHODOLOGY

Research Approach & Research Design

Quantitative Research Approach and Non experimental Descriptive Research Design was adopted for the study. The sample selected for the study was 40 children with IV cannula admitted in Paediatric ward. Sampling technique was purposive sampling technique.

Description of tool:

The tool consisted of two parts

1) Demographic variables / Risk factors affecting development of Thrombophlebitis

Demographic variables and factors affecting the development of thrombophlebitis include Age, Sex, Site of cannula, size of cannula, Type of fluids, Type of drug, Total Amount of fluids infused in 24 hours, Duration of infusion, change of IV dressing, Type of infusion, Use of restraints, and Duration of cannula in situ.

2) Visual Infusion Phlebitis scale:

This is a standardised tool developed by Mr. Andrew Jackson that consists of 0 to 5 grades based on the signs and symptoms of phlebitis. The scale is available free for public use.

Data Collection Procedure and Method

After obtaining formal permission, the purpose of the study was well explained to the parents of children having IV Cannula. Demographic variables were collected, risk factors were assessed and incidence of developing thrombophlebitis was assessed by using Visual Infusion Phlebitis scale. The data was collected on the first day of inserting IV Cannula both in the morning and evening. Descriptive and inferential statistics were used to analyse the data.

RESULTS

The results indicated that 15(37.5%) belonged to the age group of 1-3 years, 12(30%) belonged to the age group of 7-9 years, 10(10%) were in the age group between 4-6 years and only 3(7.5%) were in the age group between 10-12 years. With regard to gender 22 (55%) were Females & 18 (45%) were Males.

The above table indicates that 33(82.5%) had the IV insertion at the radial vein 30(75%) was cannulated with 22 gauge, 34(85%%) received crystalloids 29(72.5%)

received antibiotics through IV line, 31(77.5%) were receiving 100-200ml of fluids in 24 hours, 24(60%), had a duration of infusion for 2-4 hours, 26(65%) had their dressings changed regularly, 33(82.5%) received fluids through the microdrip set and 36(90%) had applied restraints over the extremity.

Table 1: Frequency and Percentage distribution of risk factors of Thrombophlebitis N=40

SL. no	Specific factors	Frequency	Percentage
1.	**Site of IV Cannula**		
	Radial Vein	33	82.5%
	Median Vein	3	7.5%
	Median Cubital Vein	4	10%
2.	**Size Of IV Cannula**		
	24 Gauge	9	22.5%
	22 Gauge	30	75%
	20 Gauge	1	2.5%
3.	**Type of Fluids**		
	Crystalloids	34	85%
	Colloids	6	15%
4.	**Type of drugs**		
	Antibiotics	29	72.5%
	Multivitamins	11	27.5%
5.	**Total Amount of Fluids infused in 24 hours**		
	<100ml	8	20%
	100-200ml	31	77.5%
	>500ml	1	2.5%
6.	**Duration Of Infusion**		
	<2 hours/day	15	37.5%
	2-4 hours/day	24	60%
	5-6 hours/day	1	2.5%
	>6 hours/day		
7.	**I V Dressing Changed**		
	Yes	26	65%
	No	14	35%
8.	**Type of Infusion**		
	Infusion Pump	7	17.5%
	Micro Drip Set	33	82.5%
9.	**Use of Restraints**		
	Yes	36	90%
	No	4	10%
10	**IV cannulation in situ**		
	<2 days	-	-
	2-3 days	9	22.5%
	>6 days	31	77.5%

Table 2 : Frequency and percentage distribution of children who developed Thrombophlebitis N=40

Sl. No.	Grade	Frequency	Percentage
1	Grade0	31	77.5%
2	Grade 1	9	22.5%
3	Grade 2	0	00%
4	Grade 3	0	00%
5	Grade 4	0	00%
6	Grade 5	0	00%
	Total	40	100%

Table 2 depicts that out of 40 children 9(22.5%) developed Grade I thrombophlebitis and 31(77.5%) had not developed thrombophlebitis i.e., Grade 0.

The above table depicts that the type of drugs was directly proportionate to the development of phlebitis and this was statistically significant (P<0.01). The use of antibiotics was found to be significantly influencing the development of thrombophlebitis than the use of multivitamins. The other factors did not have any significant impact in the development of phlebitis.

Table: 3 Factors affecting the development of Thrombophlebitis N=40

VARIABLES	P-VALUE	OR
Intercept	0.317	-
Gender		
Male	-	1
Female	0.353	3.086
Site of IV cannula		
Radial vein	-	1
Median vein	0.553	3.659
Median cubital vein	0.841	1.383
Type of fluids		
Crystalloids	0.697	1.9011
Colloids	0.801	1.483
Free water solution(dextrose)		
IV drugs		
Antibiotics	0.017*	26.316
Multivitamin	-	1
IV dressing changed		
No	-	1
Yes	0.899	1.140
Method of infusion		
Infusion pump	-	1
Microdrip set	0.244	6.098
Use of restraints		
Yes	-	1
No	0.426	3.817

DISCUSSION

The results revealed that 33(82.5%) had the IV insertion at the radial vein, 30(75%) was cannulated with 22 gauge, 34(85%) received crystalloids 29(72.5%) received antibiotics through IV line, 31(77.5%) were receiving 100-200ml of fluids in 24 hours, 24(60%), had a duration of infusion for 2-4 hours, 26(65%) had their dressings changed regularly, 33(82.5%) received fluids through the microdrip set and 36(90%) had applied restraints over the extremity.

A similar study was done in 2011 to assess the risk factors leading to thrombophlebitis i.e., type of fluid, type of drug, type of infusion, number of injections per day, rate of IV infusion, total amount of fluid infused in 24 hours, size of cannula, site of cannula, joint involved, duration of

IV cannula in situ, duration of IV set usage, cannula inserted by, cannula dressing status, cannula flush, splint over extremity and the results revealed that 40% of children were receiving free water solution (Dextrose Normal Saline) Infusion, 89% were receiving antibiotics, 39% of children were receiving continuous IV infusion. 49% of them received more than six injections per day. Further 46% of children received IV infusion at rate of 50-100ml/hour, 30% received 1000-1500 ml of fluid in 24 hours, 48% of them had 22 Gauge of cannula, 50% of children had site of cannulation at dorsum side of hand, 58% of children had joint involvement at site of intravenous cannula, 53(66%) had IV cannulation for 4-6 days and 63% of them had IV set usage for 2-4 days. In 61% of children cannula was inserted by staff nurses. In 60% of children cannula dressing was clean. In 90% of children cannula flushing was not practiced and in 89% of children splint over extremity was not present. [(3)]

The type of drugs was directly proportional to the development of phlebitis and this was statistically significant($P<0.01$). The use of antibiotics was found to be significantly influencing the development of thrombophlebitis than the use of multivitamins. The use of antibiotics and other drugs is a chemical irritant to the veins, and hence easily damage to walls of the veins, ultimately leading to chemical phlebitis. The other factors did not have any significant impact in the development of phlebitis.

A prospective study was conducted in 2015 to define possible factors associated to phlebitis development in patients admitted in pediatric general ward. The study revealed that back of hands (64.7%), using 22G catheter and (70.6%) administration of antibiotics increased the risk of phlebitis. [4]

CONCLUSION

Many children in hospital require Peripheral venous cannula as part of their medical management and care. A recognised associated risk factor is phlebitis. Nurses are well placed to assess for the presence of phlebitis and act accordingly. By observing good practice both during and after peripheral catheter insertion, complication rates of phlebitis can be reduced and patient care improved.

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