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Patency of Peripheral Venous Catheter: An Observational Study

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Abstract---

Background: *During hospitalization period of patients' PVC is frequently used device to administer medication or intravenous fluids. PVC is a plastic catheter which is directly placed into veins. If proper care is not taken; risk for acquiring systemic blood infections and local infections are increased as it is a foreign body. Such infections can lead to life threatening complications.*

Aim: *To assess patency of PVC was the aim of the study.*

Materials and Method: *Quantitative study with descriptive research design was carried out to assess patency of PVC. With the use of systematic random sampling technique 270 in patients of a tertiary care hospital were selected. To survey factors related with PVC, Modified VIP scoring scale was used. Recurrence rate of demographic variables was analysed by descriptive statistics. Collected information was associated with demographic variables with the use of SPSS software.*

Results: *Collected data stated that dominant part of male in patients (75%) were among age group of 29-30 years; patients admitted in general ward and having acute illness were of 64% (174). Additionally Study uncovered that frequency of non patent catheter 54.44% (147) was high and noteworthy affiliation was found with length of intravenous catheterization at significance level of 0.05.*

Conclusion: *From above discoveries it is clear that maximum of catheters discovered non patent and was related with long periods of insertion of PVC. Henceforth it is suggested potential complexity can be diminished with standard procedural rules and skilful nursing practice.*

Keywords--- *Patency, PVC (Peripheral Venous Catheter), Procedural Guidelines.*

I. INTRODUCTION

Peripheral venous catheter placed into vein for venous access for therapeutic purposes like administration of medications, blood products, fluids and blood sampling.[1] The plastic cannula insertion and removal of the needle was presented as technique in 1945. The very first dispensable variant to be promoted was the Angiocath, sold in 1964. During the 1970s and 1980s, the utilization of plastic cannula became routine practice and their uses was all the more every now and again assigned to the nursing staff.[2]

PVC is the everyday utilized vascular access in hospitals, basically in critical areas in emergency circumstances, peri-operative patients and before some diagnostic test such as radiological imaging examinations. During the

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1990s, in USA in excess of 25 million patients had a PVC line every year.[3] Over a billion of peripheral intravenous catheters are inserted annually in hospitalized patients worldwide. Up to 70% of admitted patients require peripheral venous catheter insertion during their hospital stay.[4] It may lead to extra cost and some iatrogenic complications in patients if it is not inserted through proper guidelines and standard procedure.[5]

Flushing of intravenous catheter in between the shifts and maintenance of drop rate as indicated are important step to maintain patency of PVC. Flushing of intravenous catheter repetitively prevents the occlusion of blood at catheter insertion site..[6] Infections related to intravenous catheterization and patency can be prevented by following the proper steps of the procedure and the guidelines as well as frequent assessment of PVC site.[7]

II. MATERIAL AND METHODS

The present study was conducted using descriptive research design at tertiary care Hospital. From 1360 patients 270 representative samples were selected by using systematic random sampling technique. Primarily every 5th patients was selected as a sample meeting the inclusion criteria. Data collection tool was created with approval of expert's recommendations and it was separated in to two segments: socio demographic information, for example, age, gender, site of catheterization and so on and modified VIP scoring scale to evaluate patency of peripheral venous catheter. The scale comprises of 10 criteria's which has positive and negative scoring. Pilot study was conducted among 28 patients who did not take part in principal study. Reliability of the tool was assessed through split half method and by utilizing Karl person's formula r=0.88 which demonstrated that modified VIP scoring scale was solid. Patients admitted in hospital above age 18 inserted with peripheral intravenous catheter were inclusion criteria for selecting samples and patients having blood coagulation disorders, receiving chemotherapeutic drugs, admitted in psychiatric ward or on dialysis were excluded from the study. Data collection was continued through interview and observation method by using modified VIP scoring scale and analysed using SPSS software to assess Descriptive statistics (mean, median, standard deviation and chi square) according to objective of the study.

III. RESULTS

Evaluation of socio-demographic attributes of the participants indicated that among 270 patients, majority (57.77%) were male, greater part of participants were from age group of (30.37%). Maximum participants (44.81%) were overweight with was above normal BMI levels and the vast majority of the participants (35.56%) were cauterized on dorsum of hand. Dominant part of the patients were mobile (66.67%) and having acute illness (64.44%). Greatest the patients (63.96%) were admitted in general ward and maximum of patients (45.93%) had catheter for over 3 days.

Table 1: Demographic Variables of Patients

n=270

Types	**Frequency**	**Percentage (%)**
Gender		
a) Male	156	57.77%
b) Female	114	42.22%
Age		

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a)	18-28 years	48	17.77%
a)	29-39 years	75	27.71%
b)	40-50 years	82	30.37%
c)	>50 years	65	24.07%
BMI			
a)	Under weight	46	17.04%
b)	Normal weight	121	44.81%
c)	Over weight	103	38.15%
Site of catheterization			
a)	Hand	96	35.56%
b)	Wrist	81	30%
c)	Cubital fossa	93	34.44%
Mobility of the patients			
a)	Mobile	180	66.67%
b)	Immobile	90	33.33%
Type of illness			
a)	Acute	174	64.44%
b)	Chronic	96	35.36%
Area of admission			
a)	Critical care unit	94	34.81%
b)	Emergency department	6	2.22%
c)	General ward	170	62.96%
Days of iv catheterization			
a)	1 day	81	30%
b)	2 days	65	24.07%
c)	>3 days	124	45.93%

Table 2: Item Wise Score of Patency of PVC by Modified VIP Scoring Scale

n=270

Sr no.	Criteria of patency	Frequency	Frequency percentage
1.	Patent	123	45.55%
2.	Non patent	147	54.44%

From above findings it is evident that majority of catheters (54.44%) found non patent. Patency of peripheral venous catheter was strongly associated with days of insertions of PVC, which shows that if the Catheter is placed in veins for more than 3 days, risk of complications can be increased..

IV. DISCUSSION

Aim of the study was to assess the patency of peripheral venous catheter and to associate these findings with the selected socio demographic variables. Most of the intravenous catheters were found non patent in this study. In confirmation with the findings of present study, a study randomized controlled trial conducted by Samantha Keogh regarding flushing frequency and volume to minimize peripheral intravenous catheter failure rate. 160 patients were assessed and found that most of the catheters were non patent as well as flushing of changing the frequency did not affected the peripheral intravenous catheter failure rate. [8]

Result of the present study indicate that there is no association of demographic variables and patency of peripheral venous catheter which is supported by a study carried out by M. Nassaji regarding risk factors associated with PVC related phlebitis. 300 patients from medical surgical ward were examined and assessed for signs of

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phlebitis. study uncovered that 26 patient got phlebitis and there was no huge connection with age, gender, catheter bore size, site, type of insertion or type of disease[9].

Present study showed that there is strong positive association between days of peripheral venous catheterization and its patency similarly in a research conducted by prospective study conducted by wei-lig lee for assessing risk factors of peripheral intravenous catheter. Complete 6538 intravenous catheters in 3165 patients were surveyed for indication of infection. They found that length of intravenous catheterization is related with patency of intravenous catheter.[10]

Procedural guidelines were found to be effective in study conducted by Simona Frigerio regarding managing and implementing evidence based guidelines. 306 PVCs were assessed before and after implementation of guidelines. And after 2 months significant improvement in practice was noted.[11]

V. CONCLUSION

This study revealed that majority of PVCs was non patent at the time of assessment. It seems that it is necessary to follow guidelines by hospital staff to maintain the patency of peripheral venous catheter. If peripheral Intravenous catheter is not taken proper care, it can lead to peripheral venous catheter related local and systemic complications, it is recommended that it is necessary to formulate and follow guidelines to maintain patency of peripheral venous catheter and monitoring of staff is required.

Ethical Consideration

A formal ethical approval received from institutional ethical committee. Informed consent was obtained from participants and assured of anonymity.

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This research was a self funded research project.

Conflict of Interest

Author declared no conflict of interest disclosed in this study.

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