

Assessment of Interns' Knowledge Regarding Peripheral Intravenous Cannulation

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Abstract: *One of the basic clinical skills that needs to be performed by medical students, interns or nurses is peripheral intravenous cannulation. Considering this, the approach to and understanding of the PIVC procedure is very important and so is the knowledge of possible complications. Methods: We included 100 interns of our medical college who underwent training for intravenous cannulation with mannequins. Assessment was done after 10 months of training program with the help of questionnaire about technique and complications associated with iv cannulation. Results: Our results revealed that knowledge about iv cannulation technique among our interns was poor, only 57% interns were aware about hand washing before procedure. However, 80% interns were aware of complications. Only 18% interns did proper documentation post procedure. Conclusion: Hence they need to undergo proper training programs multiple times under supervision of experts which will help in getting better results. It is suggested that periodic re-training in intern years may instill the right technique for longer duration.*

Keywords: IV cannula, KAP assessment, Phlebitis, Inflammation

1. Introduction

One of the basic clinical skills performed by medical students, interns or nurses is peripheral intravenous cannulation (PIVC)¹. Considering this, the health professional's approach to and understanding of the technique and complications of PIVC procedure is extremely important.

The use of peripheral cannulae is common and provides essential venous access to facilitate intravenous (IV) therapy in hospitals around the world². It is estimated that peripheral cannulation occurs in about 80% of all patients admitted to hospital³.

There are several potential complications associated with the use of peripheral cannulae, including: Obstruction, Leakage, Thrombus formation, Hematoma, Air embolism, Phlebitis⁴. Phlebitis associated with peripheral cannula is an inflammatory condition defined by the presence of at least two of the following symptoms: Local pain, Redness, Swelling, Palpable thrombosis of the catheterized vein⁵. The most common form of secondary infection in a peripheral cannula is the migration of pathogens present in the skin (often commensal flora) to the cannula insertion site, which eventually colonizes it⁶.

Most important factor in avoiding infection is how the cannula is manipulated, from insertion to maintenance, and then removal, which must be carried out using strict aseptic techniques⁷.

2. Aims and Objectives

The aim of this study is to assess the knowledge about technique of IV cannulation, and knowledge about complications associated with peripheral IV cannulation and

to assess the method of IV cannulation, through questionnaire we assessed interns knowledge regarding IV cannulation.

3. Materials and Methods

We included 100 interns of Yenepoya medical college in our study, who underwent training at the beginning of their internship for iv cannulation in simulation lab on mannequins, after 10 months of their training program they were given a questionnaire to assess regarding knowledge about peripheral iv cannulation. Our study was a descriptive study performing a KAP assessment of the common clinical skill required to be known by the interns.

4. Results

The data obtained from the questionnaire tabulated based on the responses obtained. It was analysed based on percentage of responses using Microsoft Excel.

In our study we included 100 interns among them 60% were males and remaininh were females.

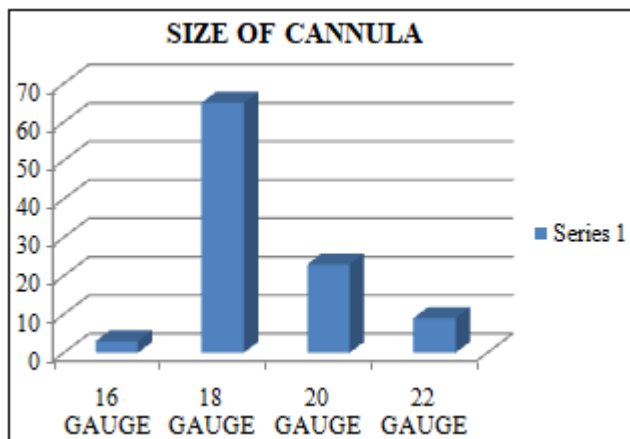


Figure 1: Size of cannula used

Figure 1 shows usage of different sizes of IV cannula. About 60% had said 18 gauge cannula is commonly used, 23% said 20 gauge IV cannula is used, 9% said 22 gauge cannula and 3% said 16 gauge IV cannula is used.

Table 1: Details about knowledge regarding IV cannulation

Question subject	Yes	No	Don't know
Hand washing	57	30	13
Extension set	34	54	12
Documentation	18	21	61
Mannequin	80	20	0

Among the questions about technique the following results were noted as summarized in Table 1. Out of 100, 57 interns were aware of washing hands before the procedure and 30 interns were not aware of washing hands and remaining had no knowledge. On usage of extension set, 34 said they used the extension and 54 said they had never used the extension and 12 were not aware of extension. Third question was on documentation where 18 interns were aware that the procedure they had performed needs to be documented, 21 said they never documented and 61 were not having knowledge that documentation is required for procedure. On how they learnt the procedure where out of 100 about 80% answered that they learnt performing peripheral intravenous cannulation on mannequin.

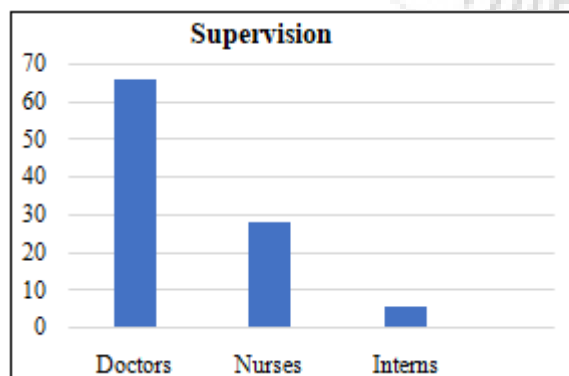


Figure 2: Supervision for iv cannulation procedure

Figure 2 shows 66% of interns were supervised by doctors, 28% by nurses, 6% by other interns.

5. Knowledge of Complications

Table 2: Knowledge about phlebitis

Complications	Percentage
Inflammation	55%
Infection	20%
Don't Know	20%
Chemical Irritation	5%

Table 2 shows knowledge about complications resulting in phlebitis following an IV cannula insertion among interns, where 55% thought as inflammation, 20% as infection, 5% as chemical irritation and 20% did not know.

6. Discussion

Our study was an observational study, which was conducted in Yenepoya medical college. After ethical committee clearance, informed and written consent was obtained from all the participants. In our study 100 interns were included out of which 60 were males and 40 were females. Initially interns were trained in simulation lab using mannequin and they were assessed after 10 months through a questionnaire. The size of cannula which was used by maximum people was 18 gauge, 57% of interns knew the importance of hand washing prior to the procedure, 34% used extension set after cannulation, only 18% knew about documenting post procedure, 80% have learnt the cannulation on mannequin.

62% interns had training under the supervision of doctors and regarding knowledge about phlebitis, 55% thought due to inflammation, 20% due to infection and 20% did not know the reason.

Carr et al.⁸ studied interns' attitude to IV cannulation. The aim and objective of the study was to identify the level of understanding of interns regarding intravenous cannulation. The Method used was An anonymized structured questionnaire using knowledge attitude and practices (KAP). This study suggests that interns are poorly prepared for one of the most common clinical skills they will perform. They showed poor understanding of whether peripheral cannulation is a clean or aseptic technique, and lacked knowledge of the potential side effects of peripheral cannulation and IV therapy. Hence they recommended. A structured learning module on peripheral intravenous cannulation is required. A rigid, evidence-based, Objective Structured Clinical Examination (OSCE) on peripheral cannulation was recommended. The results of our study was very similar to this study and the need for re training periodically is clear.

Glynn et al.⁹ did a pilot study on intravenous cannulation, A university hospital in Ireland was chosen to initiate a pilot intravenous (IV) cannulation team, to ascertain whether this procedure could be performed effectively by a team of nurses. A team of four registered general nurses, led by a senior phlebotomist, provided PIVC. A constantly increasing percentage of first-time cannulation success was displayed from the first five months of the study. IV teams performing IV cannulation can effectively reduce insertion rate attempts, and potentially offer a solution to the manpower issues arising as a result of implementation of the European Working Time Directive. Suggesting that practice with time has reduced the incidence of errors and has improved the confidence of the nurses.

Other Studies have been performed which assessed the possible complications of IV cannulations. Bregenzer et. al.¹⁰ did a study on routine replacement of peripheral intravenous catheter necessary. The study showed that out of a total of 609 catheters, 19.7% developed phlebitis, 6.9% developed catheter related infection and 6% patients developed obstruction. They concluded that the hazard for catheter related complications did not increase during prolonged catheterization. Luís Carlos do Rego Furtado¹¹ did a study to determine the incidence of phlebitis related to peripheral cannulae, and its predisposing factors in a general surgery department. A total of 171 patients and 286 peripheral cannulae were monitored. The average incidence of phlebitis was 61.5. Other elements identified as predisposing to the development of phlebitis include administration of potassium chloride, the dwell time of the peripheral cannula, and the anatomical location of the cannula.

Phlebitis associated with peripheral cannulae is still a current problem requiring knowledgeable staff who can prevent, recognize and act appropriately in a timely manner to minimize its severity.¹¹ Hence awareness of possible complications of PIVC is important for the medical professionals as it is routinely encountered by them. However, our study revealed knowledge about complications resulting in phlebitis following an IV cannula insertion among interns, where 55% thought as inflammation, 20% as infection, 5% as chemical irritation and 20% did not know

7. Conclusion

One of the most common clinical skills performed by medical professionals and paramedics is peripheral intravenous cannulation (PIVC). Our study was a descriptive study, we included 100 interns who were assessed regarding knowledge about iv cannulation, complication and documentation, where we found that the performance was not upto the mark and they need several re-training programs and proper supervision by the experts for better results. Including this clinical skill in the interns exit exam and sensitizing them regarding the importance of PIVC and its complications would be a motive for them to perform better.

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