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Assessment of Ghanaian Nurses and Midwives Knowledge about the Purpose of the Intravenous Cannula Injection Port

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Abstract The improper use of an intravenous cannula can lead to the introduction of an air embolism into a patient potentially causing injury or death. The purpose of this research was to assess nurses and midwives knowledge regarding the use of the injection port of the intravenous cannula system that is currently utilized in Ghana. A cross-sectional descriptive study approach was used by administering a questionnaire to 42 nurses and midwives attending a course at the University of Cape Coast in Ghana. The results showed that 64% of the respondents thought the intravenous cannula injection port allowed air to escape when it was left open. This is an erroneous perception about the injection port. Further research needs to be undertaken in Ghana about the use of the intravenous cannula, with particular attention paid to the usage of the injection port.

Keywords Intravenous cannula injection port, Nurses, Midwives, Air embolism, Ghana

1. Introduction

The use of the peripheral intravenous cannula has become an important device in the care of patients while in the hospital. An intravenous cannula is a small length of tiny, flexible plastic tubing used to administer fluids, liquid medications and blood products to a patient through the venous system[1]. Due to the invasive nature of the IV cannula, patients are at an increased risk for infection, air embolism, phlebitis and infiltration[2].

The port has a one way silicon retreating valve to facilitate extra medication with the help of disposable injection syringe without needle and to prevent back flow[3]. Fluid can be let into the I.V. system through this port, but cannot be released through this port.

One of the risks of using an intravenous system is that air from the I.V. tubing can be inserted into the system if care is not taken to remove it (Natal & Brown, 2012). This air can cause an air embolism. It is not exactly known how much air is needed to cause an air embolism. Air from a giving set must be eliminated by removing the end of the giving set from the cannula and allowing the fluid from the I.V. bag to push out the air into the atmosphere. If air is allowed to go through the tubing system into the individual, it could lead to an air embolism, which could eventually lead to the patient's death.

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Research shows that complications have been reported with as little as 20 mL of air (the length of an unprimed I.V. infusion tubing) that was injected intravenously[4]. The injection of 2 or 3 mL of air into the cerebral circulation can be fatal[4].

Nosocomial air embolisms can be avoided by ensuring that air from a giving set is removed the correct way, by disconnecting the giving set from the cannula and allowing the I.V. fluid to push the air out, prior to an infusion or medication being given.

Nurses and midwives are on the front line when it comes to taking care of the IV cannula and administering the needed IV medication and fluids through these cannulas. They are the ones who will notice if there is a problem with the IV so they need to be aware of risks and how to minimize them.

Prior research has been done on the routine care of intravenous catheters[5], the complications of intravenous cannula incorporating a valved injection side port in relation to microbial colonization[6], and other areas regarding intravenous cannulas, but no specific research was found regarding nurses and midwives knowledge of the function of the injection port of the intravenous cannula.

The purpose of this study is to assess nurses and midwives knowledge regarding the use of the injection port of the IV cannula system that is currently utilized in Ghana so that a proper

2. Materials and Method

This study used a cross-sectional descriptive study approach by administering questionnaire. The goal was to

find out the knowledge of nurses and midwives about the side port of an intravenous device.

2.1. Participants

Participants consisted of 42 nurses and midwives who were attending a sandwich program at the University of Cape Coast, Ghana. The nurses and midwives were currently students at UCC for two months out of the year. When they are not attending lectures the majority of them worked as full time nurses and midwives at a hospital, clinic, or health centre while some worked as health educators at midwifery, nursing or psychiatric schools all over Ghana.

Every nurse, including psychiatric, and midwife who is trained in Ghana undertakes three semesters of general nursing during their education. This includes going to the hospital to practice the theoretical aspect of their training in areas which include, but are not limited to the medical, surgical, paediatric, and emergency wards. Each of the participants, by virtue of their education, at one time trained on a ward where they were able to encounter the intravenous cannula and utilize it.

2.2. Instrument

A structured questionnaire which consisted of six closed ended questions was developed to be distributed to the nurses and midwives. The first two questions were demographic in nature inquiring about which region they worked in and how many years they had been a nurse or midwife.

The other questions dealt specifically with the intravenous port and its functions. A picture of an intravenous cannula with the port circled and labeled were included on the questionnaire to provide clarification about the device.

The questionnaire was reviewed and validated by a research professor at the University of Cape Coast prior to administration.

2.3. Procedure

Information and instructions were provided about the purpose of the study. The participants were informed that only the nurses and midwives in the class were to fill the questionnaire. It was made known that participation in the study was voluntary and anonymous, and that their filling of the forms would infer informed consent.

In the presence of the researcher, the participants who volunteered to be part of the study were given the questionnaire, which they filled the questionnaire and returned it to the researcher after completion.

3. Results and Discussion

The forty two respondents represented nine out of the ten regions of Ghana. The Upper East Region was the only region that was not represented. The majority of respondents were working in the Ashanti Region.

When the respondents were asked about the purposes of the injection port, 81% of them correctly reported that it is used to inject intravenous medications.

Figure 1. Intravenous cannula with injection port covered by injection port cap

When asked if air could be released through the intravenous port after the cap had been removed (Figure 1), a total of 64% of the respondents said that it could be.

62% of all the respondents had worked as nurses and midwives for 1-5 years and from this group 62% of them stated that the injection port was used to release air from the tube. Of the 14% respondents who had been working for over 10 years, 67% of them reported that the port was to be used to release air.

The respondents were asked if one of the functions of the injection port was to release air, 52% of the respondents said that it was a function of the port.

The sample size of forty two used in this study was based on convenience and limited resources. This research is a baseline study to ascertain the understanding of nurses and midwives about the use of the intravenous port. A differentiation of the nurses roles and positions in the health care sector would have given a better understanding of how much exposure each individual experienced in relation to having direct contact with patients with intravenous catheters *in situ*.

The lack of knowledge about the injection port of the intravenous cannula may not have been a problem found by other researchers throughout the world, but the results of the this research shows that there is a definitive lack of knowledge about the function of the intravenous side port by nurses and midwives who participated in this study. The results showed that the function of the IV cannula injection port was unclear to the respondents. The majority of them were likely injecting air into their patients when they thought the air was being released into the atmosphere through the port. This action can be dangerous and even life threatening for the patient[4].

4. Conclusions and Recommendations

Within this group of nurses and midwives, over half of them may have unwittingly injected air into their patients through the improper use of the intravenous cannula due the

poor knowledge they have about the port's functions. Further research on a larger scale by Ghana's Ministry of Heath in collaboration with the Ghana Health Service is needed in order to ascertain if this phenomenon extends to the whole community of nurses and midwives in Ghana.

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REFERENCES

[1] Shlamovitz, G. (2011). Intravenous cannulation. Retrieved from http://emedicine.medscape.com/article/1998177-overview on May 24, 2012.

[2] Morris, W. & Tay, M. (2008). Strategies for preventing peripheral intravenous cannula infection. *British Journal of Nursing*, 2008 (IV THERAPY SUPPLEMENT), 17:19.

[3] P.L. Medical (2013). I.V. cannula with injection valve port. Retrieved from http://www.plmedical.com/index.php/products/infusion-therapy-equipment/i-v-cannula-with-injection-valve-port/ on August 13, 2013.

[4] Natal, B. and Brown, D. (2012). Venous Air Embolism. Retrieved from http://emedicine.medscape.com/article/761367-overview#a0101on May 24, 2012.

[5] Webster, J., Clarke, S., Paterson, D., Hutton, A., Van Dyk, S., Gale, C., Hopkins,T. (2008). Routine care of peripheral intravenous catheters versus clinically indicated replacement: randomised controlled trial. *BMJ* 337(7662): 157–160

[6] Cheesbrough, J., Finch, R., & MacFarlane, J. (1984). The complications of intravenous cannulae incorporating a valved injection side port. *J Hyg (Lond)*. 93(3): 497–504.