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Contributing Factors in Increasing Health Care Associated Infection (Hai's) in Phlebitis Cases

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ABSTRACT

Backgrounds: One significant problem in hospital is Health Care Associated Infection (HAI's) and it gives many effects on patients health status.

Purpose: This study was aimed to examine the incidence rate of phlebitis, the procedures of IV insertion and the factors that influence the phlebitis case in-patient department at the hospital.

Methods: The main method used in this study is descriptive explorative. Started by giving training education for 15 nursing staff , medical doctor and pharmacists. Then they were obseved in doing the procedures of IV incertion, care and documentation by Using Visual Infusion Phlebitis (VIP) scale then followed by case studies to have clear results in describing the contribution factors which influence the phlebitis incidents.

Result: 35 subjects in the experimental group and 35 subjects in the control group completed The result represents that 7 from 72 patients (9,7%) were suffer from phlebitis, 25 patients (34,7%) with IV insertion were not monitored well, 5% nurses did not do the hand washing, 78% did not use the skin perlak for preventing blood to the bed linen. The mode of desinfection direction were 44% circular, 55 % from distal to proximal part, and 11% did not do the desinfectant. 100% the nurses did not documentate the IV monitoring such as the swelling, redness, the size of IV canule and any other skin symptoms of phlebitis. Some medication, insertion side of IV canule on the metacarpal area and flushing procedures were also determinant factor that lead to phlebitis cases.

Conclusion: This study conclude that the treatment, care and monitoring IV insertion is a significant and important procedures to prevent phlebitis and automatically becomes an important aspect in preventing Health Care Associated Infection (HAI's) rate in hospital.

Keywords: phlebitis, IV insertion procedure, Health Care Associated Infection (HAI's)

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BACKGROUND

Globally, the high prevalence of DM is a common problem. In Indonesia, diagnosis of DM was reported to be 133 million adults. In addition, it was estimated that 194 million adults would be diagnosed with DM by 2030, with14.7 % in urban and 7.2 % in rural areas (Indonesian Endocrinologist Society [PERKENI], 2011). The high proportion of patients remains due to poor glycemic control (Karter et al., 2005).

Health Care Associated Infection (HAI's) is a wide problem and it's becomes a main issue in many hospitals because Health Care Associated Infection will give many effects on patients health status. Nosocomical infections, nowadays called as Health Care Associated Infection (HAI's) can find easily around hospital such as; Infection in primary area (blood stream infection), Phlebitis, Urinary Tract Infection (UTI), Ventilator Associated Pnemonia (VAP), Infection in operation / surgical area. Those venues for infection cases are becomes awareness area for many health care services in increasing patient safety quality. Uslusoy and Mete (2008) said that phlebitis can lead to many health problems such us pain, more financial burden for diagnostic test, treatment, prolonged hospitlizaton, increasing patient stress and increase burden for nursing staff. Clark (2010) also emphasized that Health Care Associated Infection through phlebitis will affect length of stay, cost and satisfaction of patients.

Phlebitis is one kind of Health Care Associated Infection. Most phlebitis are happened on patients who use intravenous insertion. The capability of nurses as health workers in practical, who insert intravenous line, give drug therapy administration and monitoring phlebitis incident every day become important part in order to prevent phlebitis as Health Care Associated Infection and automatically to fillup the principles of patient safety. Their knowledge and skills about treatment, care and prevention of phlebitis must be increased in order to take control for Health Care Associated Infection.

One venue for infection nosocomial infection accidence is intravenous insertion. The microorganisme can be spreaded out through the hand of health services (mostly nurses), droplet or air borne infection. Murniati (2011), added that it can be happened through others patients contaminations, the medical instrumentals, chemical and biological matters. Smeltzer (2013) was also very agree that phlebitis is a kind of Health Care Associated Infection. Around two million patients who are suffering from phlebitis at hospital every year. The cost of this matter is almost $ 4,5 billion a year and lead to the morbidity cases more thatn 19.000 cases a year.

A small private hospital in Yogyakarta (Type D), with 50 bed capacities was a place that the preliminary study through an observation was done by the researchers. There was no accurate phlebitis data incident reported every year. Nursing manager used to ask the nursing staff about how many phlebitis cases in the morning shift; unfortunately her staff cannot answer the question exactly. The chief nurse / manager assumes that phlebitis incident is about 40 % at the hospital, because every day were found 2- 3 cases phlebitis among patients who used intravenous lines. This condition made an interested to advance nursing practical related to control infections. Furthermore, in order to develop the assessment about knowledge and skills of nurses at this hospital, the researchers indicated the need to develop the assignment by interviewing nurses and

doing observation. The observation was done on how to do the Standarized Operating Procedure (SOP) for inserting peripheral infusion and how to monitor phlebitis every day and documentation by nurses. It was believed that this procedures become a basic to reflect the nurse's knowledge and skills in preventing nosocomial infection.

After doing an observation during 5 days the hospital has not revised / up dated SOP for inserting intravenous. In the old SOP, it was stated that everybody would use gloves only for a certain circumstances such as in dealing with major surgical and invasive procedures. It doen't mentioned and behaved that IV insertion and phlebitis care and treatement are also need to be aware with universal precaution including hand washing and use of gloves.

Besides, other health care workers such as physicians and pharmacists are important persons also who have main role in phlebitis incident. Physicians have responsible in proper drug therapy because drugs bring side effect to become chemical phlebitis. The pharmacists have responsible to supply adequate equipments for inserting intravenous lines such as gloves, intravenous cannula, and fluids and drug therapy. In this case, the collaboration among nurses, physicians and pharmacist to prevent phlebitis incident should be done in order to improve quality of care to patients.

The infection control standard that may prevent the Health Care Associated Infection (HAI's) through the phlebitis treatment, care and prevention was not clearly done. Many patients from emergency department who using IV insertion were not monitored and cared until they were hospitalized in ward and some of them surprisingly did not monitored until they were homed. This condition lead to stimuly phlebitis and if it not cared can lead to Health Care Associated Infection that causes dmortality and morbidity rate. The invation of microorganisme through IV insertion which lead to phlebitis cases can be spreaded out through the hand of health care services; mostly nurses, droplet or air borne infection, others patients contamination, the medical instrumentals, chemical and biological matter and any other vectors.

OBJECTIVE

This study is aimed to: (1) Examine the incidence rate of phlebitis in the hospital, (2) Observe the procedures of IV insertion from emergency room until inpartient deparment, (3) Explore the factors that influence the phlebitis case in-patient department at the hospital.

METHODS

This study were quantitative – qualitative design, were started by pra experimental study through giving training education for 15 participants. The target participants in reducing phlebitis at this hospital was for nursing staff; although as pharmacist and physician were important part in order to make coordination for reducing phlebitis cases by supplying material for inserting IV and giving drug therapy for patients.

The target audiences in this project were nursing staff and pharmacists which include 15 participants in phlebitis training. The nurses are from emergency room, maternity and pediatric room and medical surgical room. Attending the training was a mandatory from

nursing manager. She has a desire that the participants will continue to be role models for other nurses in order to do the prevention of phlebitis. The audiences were the representative for each room. They were the chiefs of rooms and their staffs. They will have a power to influence and support the other nurses. According to Monojlovich, (2007) power is important to influence an individual or a group. But without empowering there was nothing to act. Therefore, empowering of participants to be the role models will be effective in order to take control of infection especially to reduce phlebitis cases.The training courses were contented by phlebitis treatment, care and prevention than continued by training skill for two months in reading and monitoring phlebitis scale. Those participants were the head and staffs from emergency room, maternity room and pediatric room and medical surgical room. Two farmacists and one medical doctor were also participated in this study.

After this first phase, then 18 nurses were monitored in doing the procedures of IV incertion, care and documentation. Then the last phase was two case studies were done in examinating and evaluating the behavior of nurses on how to treat, care and monitor phlebitis scale.

The reasearch were done in a private hospital, type D in Yogyakarta with 50 bed capisities and 25 nurses. The first phase was happened in the end of 2012 and then followed by observation in year of 2013 and 2014. Then two case studies were happened on April 2015.

The measurements on this study were Visual Infusion Phlebitis (VIP) scale thta recommedate by INS (Infusion Nurses Society, 2011). This composed 0 – 5 score valid and realible measure.

Table 1. VISUAL INFUSION PHLEBITIS SCORE
Recommended by Infusion Nurses Society (2011)

Appearance	Score	Stages
I.V. site appears healthy	0	No signs of phlebitis ➔ Observe cannula
One of the following is evident: ● Slight pain near I.V. site or slight redness near I.V. site	1	Possible first signs of phlebitis ➔ Observe cannula
Two of the following are evident: ● Pain near I.V. site ● Erythema ● Swelling	2	Early stage of phlebitis ■ → Resite cannula
ALL of the following are evident: ● Pain along path of cannula ● Erythema ● Induration	3	Medium stage of phlebitis ■ → Resite cannula → Consider treatment
All of the following are evident & extensive: ● Pain along path of cannula	4	Advanced stage of phlebitis or start of thrombophlebitis

Appearance	Score	Stages
● Erythema ● Induration ● Palpable venous cord		■ → Resite cannula →Consider treatment
All of the following are evident & extensive: ● Pain along path of cannula ● Erythema ● Induration ● Palpable venous cord ● Pyrexia	5	Advanced stage of thrombophlebitis → Initiate Treatment → Resite Cannula

The statistical method used in this study was unvariate statistic, frequency distribution to describe the incidence rate of the phlebitis. Then content analysis was also used to process the qualitatif date in the case studies.

RESULT

The first phase of the result represents the incidence of phlebitis monitored in the hospital on 1 – 20 March 2013.The number of patient who used IV infusion were 72 patients. It found that 7 from 72 patients (9,7%) were suffer from phlebitis. 25 patients (34,7%) were not observed since the IV insertion were done in the emergency room until inside the ward, 30 patients (41,7%) were observed but it done only in a moment (unperiodically).

After this observation then the reseracher examined the procedures during IV chateter insertion on 18 nurses as participants. The observation were done for three months, between January until March 2014. In term of preparation phase all the participants said that the nurses explained the procedures to the patients very well. In case the patients were child, the nurses explaiened to the parents or the elder. 16 partisipants (88%) monitored the IV dressing, observed the blood in the IV line, swelling and pain in the IV insertion area. 94 % were intents with privacy when doing the procedures, positioning the body inline with the bed, 95% nurses do the hand washing before doing the procedures and 78% did not use the skin perlak for preventing blood to the bed linen. The mode of desinfection direction were 44% circuler, 55 % from distal to proximal part, and 11% did not do the desinfectant. In term of monitoring and documentation , 100% the nurses did not documentate the IV monitoring such as the swelling, redness, the size of IV canule and any other skin symptom of phlebitis.

The last phase of the studi was done by doing indepth interview and observation to eight nurses who care of two patients with Stroke Hemorrhagic in medical surgical ward. These patients experienced the phlebitis on second and third days. Some factors that stimuly of the phlebitis symptoms were (1) Chemical agent such us Manitol infusion and some medication (Tranexamide acid, Hystamine H-2 antagonis receptors, Citidine diphospate-choline) that administered to the patients can lead to the phlebitis symptoms, (2) The insertion side of IV canule on the metacarpal area were area that phlebitis can occured easily because this area has very sensitive and fragile venous, and (3) The flushing procedures were also determinant factor that lead to phlebitis cases.

DISCUSSION

The results indicated that 9,7% patients were suffering from phlebitis which can contributed to the Health Care Associated Infection (HAI's) development at the hospital. The Infusion Nursing Standards (INS) and Center for Disease control and Prevention (CDC) recommended that Phlebitis rate should less than 5% for a hospital (Powel, at al. 2008). Those 9,7% phlebitis accidences can be occured because of the openess venue for infection nosocomial infection accidence through the invasion of the microorganisme through the hand of nurses, droplet or air borne infection. Murniati (2011), added that it can be happened through others patients contaminations, the medical instrumentals, chemical and biological matters. The researcher also assumed that the standardize for inserting peripheral infusion protocol to prevent phlebitis incident was not done well in the ward. According to CDC (2011) wearing clean gloves is a mandatory as aseptic technique. Besides, using transparent dressings can reduce risk for thrombophlebitis. Furthermore, the use of antibiotic ointment and cream is not recommended on inserting sites because of their potential to promote fungal infection and antimicrobial resistance. That recommendation was from CDC and it can be used as a basic for guidance on operation standardized procedure. Although, the phlebitis incidents can be caused also such as inadequate hand washing, wrong way to insert vena catheter into vein and drugs and fluids.

Meanwhile, 4,7% patients were not observed for developing phlebitis since the IV insertion were done in the emergency room until inside the ward and 30 41,7% patients were observed but it done only in a moment (unperiodically). This conditions leads to increase the phlebitis incidences and it increased cost for treatment of the phlebitis. The INS in 2011 recommended using Visual Infusion Phlebitis (VIP) scale by Jackson in 1998. The VIP scale which includes 0 – 5 score is valid and reliable measure for determining when an intravenous catheter should be removed (Higginson, 2011). Phlebitis scale monitoring must be done in every shift of nurses for every day. According to CDC (2011) phlebitis can be reduced by replacing cannula after 72-96 hours. Hence, documentation and monitoring are necessary to know the date of insertion peripheral intravenous.

Furthermore, the proper for inserting IV cannula becomes important part for reducing phlebitis incident. 4 % nurses were intents with privacy when doing the procedures, positioning the body inline with the bed, 5% nurses did not use the gloves and do the hand washing before and after doing the IV insertion procedures. This conditions can be happened because of the toxix time and time pressure to handle patients at emergency room. In another side the number of nurses at emergency room were also minimal. In fact CDC (2011) already recommended that if nurses have no time for water based hand washing, it encourrages to use alcohol based-hand rub (ABHR) before inserting vein catheter to perform hand hygiene and preventing health care associated infections. This ideas was supported by Maywald (2009) who said that ABHRs is effective for decontaminating hand in health care setting by using about 60 – 90% of alcohol content. Unfortunately, the data was significantly showed that 100% the nurses did not documentate the IV monitoring such as the swelling, redness, the size of IV canule and any other skin symptom of phlebitis. According to Cheevakasemsook, et al. (2006) nursing documentation has important function to ensure the continuity of care. There

were three complexities in nursing documentation including disruption, incompleteness and inappropriate charting. Some factors that influenced documentation were limited nurses' competence, motivation and confidence, ineffective nursing procedure and inadequate nursing audit, supervision and staff development. he last results from the case study showed that the patients got phlebitis on second and third days. Some factors of the phlebitis were all patients got Mannitol infusion that has high osmolality and was the insertion of intravenous lines on metacarpal area. Besides, nurses did not give flushing with NaCl 0.9% after giving intravenous injections.

Phlebitis is a term of nosocomial infection. According to Higginson (2011) phlebitis is caused by inflammation of vein at cannula access site. It can be caused by mechanical, chemical and infectious cause. Mechanical phlebitis related to the selection of the cannula to the vein because it can make friction and inflammation if the size of cannula does not match with the vein. Chemical phlebitis is caused by drugs, fluid being infused through the cannula; pH and osmolarity of drug and fluid are become factor of chemical. Besides, infective phlebitis is caused by the introduction of bacteria into the vein. Some factors are poor skin cleansing before cannula insertion, poor practice during drug administration. Health Care Associated Infection will affect length of stay, cost and satisfaction of patients (Clark, 2010). Hence, nurses have responsibility to reduce the infection nosocomial. Reducing phlebitis cases is one of term for reducing Health Care Associated Infection. By knowing some types and etiology of phlebitis, nurses have major roles to prevent the phlebitis cases.

According to Gorski (2007) INS recommended for avoiding peripheral vein irritation, drugs infusions should have PH no less than 5 and more than 9 and osmolarity should has no more than 600 mOsm/L. PH and osmolarily can cause chemical phlebitis. The mannitol infusion has 1098 600 mOsm/L, besides the insertion of intravenous lines at metacarpal. As recommended by Cleary (2011) site selection shall be initiate distal area of upper area, although for some cases to avoid phlebitis case large are is the better such as cephalic or basilica vein. Meanwhile, nurses did not give flushing with NaCl 0.9% after giving intravenous injections can increase phlebitis incidence. Eghbali-Babadi, Ghadiriyan. & Hosseini (2015) recommended to use saline lock to reduce incidence phlebitis.

Forming a team for infection control who has responsible to take control Health Care Associated Infection would become important part in order to encourage nursing staff to prevent phlebitis incident. It is supported by Silva, et al. (2010) who described the importance of IV team and standardizing the IV catheter brought significant gains for patients, nursing professional and the institution to reduce the infection cases, increasing comfort patients and increasing the safety of practitioners. The team has responsibility to provide quality management of care that is important to make decision and review process. The protocol is very important as guide for nursing staff work in inserting peripheral infusion.

CONCLUSION

Phlebitis incident is a serious problem at a hospital that it should be handled because phlebitis brings effect in length of stay, financial and satisfaction of patients. Nursing

staffs have responsible to prevent and reduce phlebitis incident. Knowledge and skill, behaviors and awareness of nurses are basic for infection control especially for reducing phlebitis incident and can aoutomatically decreasing Health Care Associated Infection cases.

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