Original Article

REVISTA PREVENÇÃO DE INFECÇÃO E SAÚDE (REPIS)

Analysis of nursing care to users of peripheral venous access

Análise da assistência de enfermagem aos usuários de acesso venoso periférico

Análisis de la asistencia de enfermería a los usuarios de acceso venoso periférico

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ABSTRACT

Objective: To analyze the nursing care provided to users of peripheral venous catheter. **Method:** Descriptive, cross-sectional study, performed at a mid-sized hospital situated in the high productive backcountry of Bahia, whose participants were surgical patients using peripheral venous catheters for more than 72 hours. **Results:** 103 patients were included; 15.5% of the bandages were dirty and/or wet, 40.8% had no date of insertion, 58.3% had no professional identification, 34.9% showed signs of infection, 50.4% did not have records on the chart and 33% presented bacterial growth. **Conclusion:** Nursing care to users of peripheral venous catheters has not been adequate, resulting in preventable complications when considering scientific recommendations for care with peripheral venous access.

Keywords: Nursing Care; Venous Catheters; Health Promotion.

RESUMO

Objetivo: Analisar a assistência de enfermagem prestada aos usuários de cateter venoso periférico. **Método:** Estudo transversal, descritivo realizada em um hospital de médio porte situado no alto sertão produtivo da Bahia, cujos participantes foram pacientes cirúrgicos em uso de cateteres venosos periféricos há mais de 72 horas. **Resultados:** 103 pacientes foram incluídos 15,5% dos curativos encontravam-se sujos e/ou úmido, 40,8% não apresentavam data de inserção, 58,3% não revelavam identificação profissional, 34,9% apresentavam sinais flogísticos, 50,4% não apresentavam registros no prontuário e 33% apresentaram crescimento bacteriano. **Conclusão:** A assistência de enfermagem aos usuários de cateteres venosos periféricos não tem sido adequada, resultando em complicações que podem ser prevenidas quando considerado as recomendações científicas para cuidados com acessos venosos periféricos.

Descritores: Assistência de Enfermagem; Cateteres Venosos; Promoção da Saúde.

RESUMEN

Objetivo: Analizar los cuidados de enfermería prestados a los usuarios de catéter venoso periférico. **Método:** Estudio descriptivo transversal, realizado en un hospital de tamaño medio situado en alto sertão productivo da Bahia, cuyos participantes fureron pacientes quirúrgicos en el uso de catéteres venosos periféricos durante más de 72 horas. **Resultados:** 103 pacientes fueron incluidos el 15,5% de las vendas estaban sucios y/o mojados, el 40,8% no tenía fecha de inserción, el 58,3% no presentaron identificación profesional, 34,9% mostraron signos de infección, el 50,4% no tienen registros en la pizarra y el 33% presentaron crecimiento bacteriano. **Conclusión:** La asistencia de enfermería a los usuarios de catéteres venosos periféricos no ha sido adecuada, dando lugar a complicaciones que pueden prevenirse si se tienen en cuenta las recomendaciones científicas para el cuidado con el acceso venoso periférico.

Descriptores: Asistencia de Enfermería; Catéteres Venosos; Promoción de la Salud.

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INTRODUCTION

Most health services widely use the intravenous therapy (IT), highlighted by its large use within the hospital context. It requires peripheral venous catheters, in which the proper and assertive use is considered one of the main indicators of nursing care quality[1-2].

Its application requires a set of interventions that begin in the choice of the type of device (needle or silicone), size and location of insertion (peripheral or central)[3].

The peripheral venous catheters are considered indispensable devices for direct access to the interior of the venous vessel, allowing administration of medications and fluids, blood products and the attainment of hemodialysis[4-6].

Although the use of venous catheters confers several benefits, this procedure is not riskless, because their use causes rupture of skin integrity, making it vulnerable to the entry of microorganisms, which provides various complications, such as phlebitis, local infection, bacteremia, occlusion, leak, thrombosis, hematomas, among others[3,5,7].

The time of permanence of the catheter, the puncture site, the form of maintenance of the device, the patient's age, the type of material, drugs and coverings used and the non-adhesion of nursing professionals to preventable measures of infection are the main risk factors for local complications of IT in adults[3].

Simple actions, such as the regular exchange and maintenance of equipment, the complete identification of the fluids and medications administered, evaluation of the insertion site regarding the presence of signs of infection, the verification of the permeability of the device and the integrity of coverage, as well as catheter exchange in the period from 72 to 96 hours, as proposed by the Center for Disease Control and Prevention (CDC), are essential measures to prevent undesirable results[8].

The nursing team is the main responsible for the insertion and maintenance of peripheral venous catheters, because the procedure requires careful evaluation of the most suitable place for puncture and an effective technique that will lead the device to the inside of the blood vessel as safely as possible, thus, professionals need to acquire technical and scientific competence to assume the responsibilities of such procedure, as well as be attentive to the care recommended for the handling of the devices used, in order to promote patient safety, brief hospitalization and, consequently, minimize public spending[8-9].

Considering the importance of scientific knowledge of nursing professionals regarding the mechanisms involved in the insertion and maintenance of a peripheral venous access, as well as the importance of IT for quality assistance that follows patient safety, the guiding question emerged: How has nursing care been provided to users of peripheral venous catheters?

In this perspective, this study aimed to analyze the nursing care provided to users of peripheral venous catheter.

METHODS

This is a cross-sectional study of exploratory and quantitative approach, performed at a mid-sized

hospital situated in the high productive backcountry in the period from August to November 2016.

The inclusion criteria were patients admitted to the surgical clinic (elective or not) and using silicone peripheral venous catheter with insertion time exceeding 72 hours. The exclusion criteria were obstetric patients, since they mostly use catheters for less than the aforementioned period, and hospitalized patients using silicone catheter inserted within less than 72 hours or using needle peripheral venous catheter.

The catheters were introduced in the hospital environment and had exchange forecast between 72 and 96 hours, except in the occurrence of complications. The authors carried out the collection on alternate days, promptly forwarded to the laboratory of the State University of Bahia, where the sowing and analysis were held.

Data collection occurred in two moments: Initially, searches were performed in the medical records of patients who were using silicone peripheral venous catheter, extracting data from patients' records inherent to the peripheral venous access (catheter diameter, insertion site, presence of signs of infection, integrity and catheter exchange), using a semistructured instrument.

Subsequently, there was the collection of tips of peripheral venous catheters, observing the aseptic criteria, using fenestrated field 15x15 cm, ABC 14 cm anatomical dissection tweezers, ABC 15 cm curved surgical scissors, gauze and sterile ampoule bottle and procedure glove. During the withdrawal of the device, there were peri-insertion antisepsis and withdrawal of 5 cm to sample, stored in sterile flasks and identified, sent to the microbiology laboratory, within the period of 1 hour, which held the performance of culture on blood agar and conditioning in hothouse at 35°C for 48 hours.

The study followed seeding and reading technique of microbial growth described by researchers in the area[10-11] following the technique in which a microbial growth showing number > 15 colony forming units was considered positive and performing analysis for identification of the microbial agent, and growth ≤ 15 colony-forming units was considered negative.

Respecting the Resolution 466/12 of the CNS of MS, the present study was submitted to the Research Ethics Committee of the State University of Bahia with approval under opinion 1.470.137 of 03/30/2016.

RESULTS

In the period of collection, 103 patients admitted to the surgical clinic using peripheral venous catheters for a period exceeding 72 hours were approached, of these, 52 (50.4%) were male, mean age of 53.7 years (variance of 18 through 69 years), the most frequently self-reported color was *pardo* 61 (59.2%).

From the isolation and culture of the catheters collected, 34 samples (33%) showed bacterial growth of *Sthapylococcus* sp.

The results of the characteristics of peripheral venous catheters were calculated in absolute

and relative frequency and are available in *Table 1*.

Table 1 – Distribution of characteristics of peripherally inserted venous catheters of patient of a mid-sized hospital. Guanambi. Bahia. Brazil, 2016.

	Absolute Frequency	Relative Frequency
COVERAGE CONDITION		
Inadequate	16	15.5%
Adequate	87	84.5%
INFLAMMATORY CONDITION		
With phlogistic signs	36	34.9%
Without phlogistic signs	67	65.1%
ACCESS PERMEABILITY		
Pervious	64	62%
Obstructed	39	38%
INSERTION DATE IDENTIFICATION		
Identified	42	40.8%
Unindentified	61	59.2%
PROFESSIONAL'S NAME IDENTIFICATION		
Identified	43	41.7%
Unindentified	60	58.3%
CATHETER NUMBER IDENTIFICATION		
Identified	60	58.3%
Unindentified	43	41.7%
RECORD ON THE CHART		
With record	51	49.6%
Without record	52	50.4%
BACTERIAL GROWTH		
With growth	34	33%
Without growth	69	67%

DISCUSSION

As well as the findings in this study, the permanence of peripheral venous catheters for a period exceeding 72 hours has been a routine practice within the hospital, disregarding the recommendations of the Center for Disease Control and Prevention (CDC) for catheter exchange[2,7,12-13].

The prolonged permanence time of the device is a determining factor for the development of complications such as phlebitis, infiltration, obstruction and traction[12,14]. On the other hand, their frequent exchange also relates to complications, therefore, the implementation of the practice of exchange in the period of 72 hours by nursing professionals has the potential to reduce risks to the hospitalized patient[2].

Among the complications associated with the use of peripheral venous catheter, phlebitis is characterized by an inflammation in the venous wall that whose symptoms are edema, pain or redness at the puncture site[13-14], and its occurrence increases risk in 2.43 (p = 0.0085)

when exceeding 72 hours of insertion of venous device, in addition to being the second main reason for withdrawal of the catheter[7,12].

Another complication incident to the use of catheters is the leak of infused solution into the interstitium, whose risk factors are prolonged permanence time and number of attempts[7,12]. Multiple attempts (> 3) of insertion of a peripheral venous catheter increases the risk of leakage in up to six times[7].

Regarding IT, the nursing practices must include knowledge about possible complications, as well as its precipitating factors, in order to avoid them through procedures that guarantee the safety in assistance[2,14]. In this way, the technique of washing hands must be used before any procedure and, considering the likelihood of infiltration, or any other complication, the professional should constantly observe the puncture site of the catheter for an immediate intervention[5].

In this study, there was a higher frequency of complications in males aged over 65 years and self-reported *pardo* color. These data differ from another study that showed a higher frequency in females aged less than 50 years, but self-reported *pardo* color, in this way, importantly, these variables do not significantly influence the occurrence of complications related to the use of peripheral venous access[13].

The use of sterile cover on the peripheral venous catheter is necessary for its fiction and protection, strongly recommending the use of gauze or semi-permeable transparent plate, however, this practice has not yet been implemented[15-16].

In places of hot and humid climate, for example, non-sterile covers, because of their long-term fixation, have replaced the use of semipermeable transparent curative, which may be responsible for the incidence of complications related to the access[13]. Research on characterization of peripheral venous catheters identified the use of plaster in 40.8% of the accesses and use of hypoallergenic tape in 59.2%, emphasizing that, depending on the bandage, this may be responsible for unexpected withdrawal of the device[17].

Also regarding coverage of the peripheral venous catheter, there was the non-identification of access containing information necessary for the care continuity, such as date and time of the puncture, size of the catheter used and identification of the professional responsible for the procedure, corroborated by another study that questioned the care quality when showing 23.7% of incomplete records[17].

A qualified professional should be responsible for the puncture and the whole procedure, thus, when performing it, the professional's identification is essential, as well as recording the caliber and temporal orientation to allow adequate maintenance of access[14].

The signs of infection were present in 34.9% of the assessed peripheral venous accesses, showing a deficit in the prevention and detection of complications. From this perspective, the importance of inspecting the procedure stands out for immediate intervention in the presence of risks for the patient. A study relates this deficit to the lack of nurses next to users of the service, due to the delegation of the

venipuncture technique to members of the nursing team, and the possible non-supervised procedure or maintenance[17].

As well as identified in this study, the absence of information on the procedures performed in the patient's chart represents a limitation for both nursing care, as well as for researches, being evidenced in several studies[7,12,17].

The analyses of the tips of peripheral venous catheters pointed to a bacterial growth of 34%, being the *Sthapylococcus* sp the main pathogen, which suggests that infections of the bloodstream may or may not be associated with the use of peripheral venous catheters, once the pathogen is part of the skin microflora[5].

Despite the low rates of bacterial growth and its little description in the literature, it often relates to prolonged insertion time, phlebitis, and yet the equatorial climate due to skin transpiration and high air humidity, which may predispose the colonization[13-14].

These facts reveal the importance of the device maintenance as one of the main preventive measures of infection, in addition to educational practices with the other professionals involved[5]. Thus, the nursing care, especially in the hospital environment, in terms of patient safety and intravenous therapy, is still a great challenge at health institutions[18].

CONCLUSION

Nursing care to users of peripheral venous catheters has been inadequate, resulting in preventable complications when considering scientific recommendations for care with peripheral venous access.

The peripheral venous access is indispensable in the treatment of a hospitalized individual and requires scientific training of professionals, in addition to their competence and skill. In this way, from the reflection of nursing professionals' behaviors in the care necessary for peripheral venous catheters, as well as their maintenance, the rates of complications associated with peripheral venous access may significantly reduce, consequently reducing the hospitalization time and public spending.

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COLLABORATIONS

The authors DAS and JLPS planned the activities that led to the work. AOP and CBML collected the data. AOP, CBML and DAS performed data analysis and interpretation. AOP and CBML wrote the text. DAS and JLPS did the critical review of the intellectual content of the manuscript. AOP, CBML, DAS and JLPS have approved the version to be published and assume responsibility for all aspects of the work, including the guarantee of its accuracy and integrity.

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CONFLICTS OF INTEREST

No conflicts of interest to declare.

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