78 - BLOODSTREAM INFECTION IN PATIENTS WITH CENTRAL VENOUS CATHETER HOSPITALIZED IN AN INTENSIVE CARE UNIT

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INTRODUCTION

The Intensive Care Unit (ICU) is a complex structure that offers advanced support of life to potentially serious or unbalanced patients. These need continuous monitoring and become exposed to a series of risks that can contribute to worsen even more their general condition, facilitating the installation of infectious processes. Thus, the invasive procedures are constantly performed in the treatment to patients hospitalized in the ICU, and the central venous catheter is indispensable to help to help improve the general condition of the patient (LIMA; ANDRADE; HAAS; 2007).

For Marino (2008, p. 105 emphasis added) "The term central venous catheter refers to the catheter which is projected for the cannulation of the da subclavian vein, the internal jugular vein or the femoral vein".

The central venous catheter (CVC) is indispensable in the clinical practice, since they are used for hemodynamics monitoring, infusion of medicine and intravenous solutions for patients with limited peripheral venous access, or yet for the para infusion of parenteral nutrition, vasoactive drugs, access for hemodialysis and collecting blood samples for lab analysis (KNOBEL; LASELVA; JÚNIOR; 2010).

However, there are several reports regarding the complications of this procedure, Knobel; Laselva; Júnior (2010, p. 190) describes those as: "infection, pain or discomfort during the execution of the procedure, pneumothorax, hemothorax, thrombophlebitis, cardiac arrhythmia, and due to direct stimuli from the catheter, bruises, gas embolism, lung embolism and cardiac tamponade".

In light of the importance of the theme, the current research came up due to its occurrence in this hospital unit, and the daily charging from CCIH towards the nursing team that assists directly and indirectly this patient, who is fragile and exposed to the risk, seeking to increase the knowledge in search of the improvement of assistance, diminishing, this way, the occurrence of immediate or late complications of the infections.

Thus, the general objective was to evaluate the occurrence and the risk factors of bloodstream infection in patients with central venous catheter double lumen (CVC), hospitalized in an intensive care unit in the private hospitals in the city of Cascavel – PR, as well as the specific objectives were to analyze the microorganisms isolated in the bloodstream, identify the place for insertion, define the immediate and late complications, check the hospitalization time and permanence of the Central Venous Catheter (CVC), observe the adhesion of the preventive measures and contribute with CCIH, showing the results of the research.

MATERIALS AND METHODS

This is a field, documental, exploratory, and descriptive of quantitative approach research.

According to Marconi and Lakatos (2009a, p. 188) the field research aims to seek for the answer to a problem, through observation of the facts or phenomena, getting enough information for its comprehension.

For Prodanov and Freitas (2013, p. 72) the documental search is similar to the bibliographic type, yet it is defined as "materials that didn't get analytical treatment or can be redesigned" according to the aim of the research. As mentioned by Gil (2008), there are the processed materials, but these can be interpreted in different ways.

Whereas the exploratory research aims to raise questions or problems, with three main purposes: Building hypotheses, involving the researcher with the environment and altering or defining concepts (MARCONI; LAKATOS, 2009b).

In regard to the descriptive research it is necessary for data collection, a standard tool that directs the description of the results precisely aiming to report the characteristics of a determined population group and its happenings (GIL, 2009).

Thus, descriptive-exploratory studies matched "are exploratory studies aim to describe completely a certain phenomenon, like for example, the study of a case for which empirical and theoretical analyses are done" (MARCONI; LAKATOS, 2009b, p. 71).

Through the use of resources and statistics techniques, Fleming et al., (2005, p. 17) defines the quantitative research as "it considers that everything can be quantified, which means change opinions and information into numbers to classify them and e analyze them".

In order to collect data regarding the evaluation of infection occurrence in the CVC an individual record containing daily evolution of procedures was used and to evaluate the risk factors in each period the nurse of the unit was responsible for his/her team using a check-list, which was answered through daily observation of the de preventive methods application (ATTACHMENT A and ATTACHMENT B). Both were applied in the admission of the patient in the Intensive Care Unit until its discharge or transference to another hospital.

The sample was composed of 20 patients submitted to the catheter double lumen, for more than 24 hours, independently on the age, pathology, and use of medicine, admitted in an Intensive Care Unit from a Hospital Institution in the city of Cascavel – PR, from May to June 2015.

As exclusion criteria, patients who entered the ICU with the CVC already inserted and patients that died before 24 hours were left out.

After collecting, the information was analyzed through statistics, where the data were inserted in an electronic spreadsheet for quantitative analysis and confronted with bibliographic referential on the theme.

To develop this research, total secrecy was guaranteed about the information collected, respecting the patients' privacy and orientating about the freedom to decide whether to participate or not in the research. So, the approval of the Ethical Committee from Universidade Paranaense–Unipar was respected, as well as the Resolution 466/2012 which established the guidelines and rules for research involving human beings. (BRASIL, 2012).

The Project was approved by the Research Ethical Committee from Universidade Paranaense UNIPAR, head office Umuarama-PR, according to the number from CAEE 43399615.4.0000.0109.

RESULTS AND DISCUSSIONS

Among the 20 patients observed only 1 (5%) had infection and was affected by the microorganism Staphylococcus epidermidis. A low index of infection by CVC is observed, once the occurrence in the ICU is high.

Hence, Henrique et al., (2013, p. 134) emphasizes that "the infections related to the use of the central venous catheter (CVC) have become a great problem. It is estimated that approximately 90% of the bloodstream infections (ICS) are caused by the use of central venous catheter".

According to Theisen (2010) the invasive procedures are frequently affected by Staphylococcus epidermidis, which are part of the skin natural microbiota and have a great capacity of invading and adhering the polymer surface, colonizing and forming the biofilm.

Out of 20(100%) patients, 11(55%) didn't show late complications, but the others had alterations such as: 7(35%) persistent hyperemia (>38C), 1(5%) worse blood count exams and platelet and 1(5%) pneumothorax.

Regarding the choice for the place of insertion of the CVC, the results showed 21(77,78%) entries in the subclavian and 6(22,22%) entries in the jugular. Comparing the results obtained we can affirm that there was predominance in the choice of the subclavian via rather than the jugular.

The place for insertion of the catheter according to Couto; Pedrosa; Nogueira, 2009; Garcez, 2010 (apud COSTA, 2011) contributes for increased risk of infection if punctured in the internal jugular vein (VJI) rather than in the subclavian or femoral, due to its location next to oropharyngeal secretions and to difficult handling of the device.

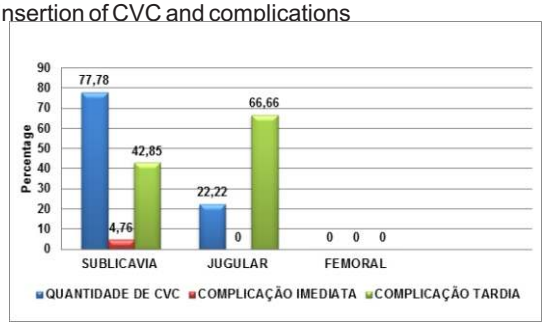
Related to the complications in the subclavian insertion, pneumotórax was observed as an immediate complication 1(4,76%) and persistent hyperemia as a late complication, worse results in the blood count and platelet 9(42,85%). On the other hand, there weren't immediate complications in the insertion in the jugular, yet there were late complications defined as persistent hyperemia 4(66,66%).

However, Araújo (2003) shows that most of the authors prefer the direct Internal Jugular Vein since it gives access to big thoracic veins and brings about less complications than subclavian veins, its complication can be rare, but fatal, such as pneumothorax e hemothorax, chylothorax, air embolism, thrombosis, phlebitis among others.

Nonetheless "The subclavian vein must be chosen for central venous cannulation due to the easy insertion, low index of complications and high degree of acceptance from the patient when the catheter in in" (MARINO, 2008, p. 112).

The results can be seen in PICTURE 1:

3.1.Picture 1 – Place for insertion of CVC and complications



Source: Researcher's data, 2015.

In regard to the hospitalization time, out of the 20(100%) patients searched 4(20%) remained hospitalized in the ICU until the end of data collection. Nevertheless, their hospitalization time varied from 1 day to 35 days, showing a sample 5(25%) from 1 to 5 days, 2(10%) from 6 to10 days, 2(10%) from 11 to 15 days, 3(15%) from 16 to 20 days, 2(10%) from 21 to 25 days, 1(5%) from 26 to 30 days, 1(5%) from 31 to 35 days, stayed hospitalized 4(20%).

Only 8(40%) of the observed patients remained hospitalized more than 21 days in the ICU, so having an increased risk of bloodstream infection.

The long permanence of the patients in the ICUs due to the fact of diagnosis, and the necessity of invasive procedures, as well as the long-term use of CVC for advanced support of lfe in the ICU, cause an increase of infections, not to mention the increase of hospital costs (MESIANO; HAMANN, 2007).

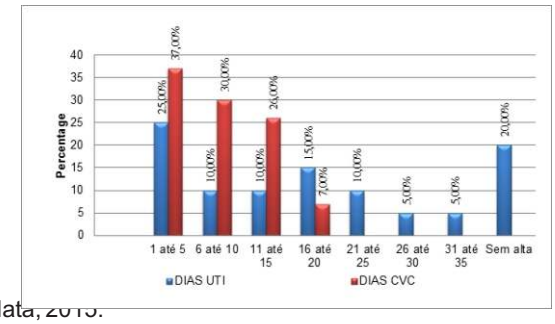
Regarding the permanence of the CVC, it varied from 1 day as the minimum time and 20 days as the maximum time, obtaining as a result 10(37%) from 1 to 5 days, 8(30%) from 6 to 10 days, 7(26%) from 11 to 15 days, 2(7%) from 16 to 20 days.

From the results obtained, we can see that out of the 27(100%) CVC that were inserted, 18(67%) correspond to the time of permanence that are within 1 to 10 dias, which is a determinant factor in the prevention of complications in the bloodstream; it appears that 2(7%) CVC remained at the maximum time of 20 days.

Mesiano and Hamann (2007, p. 4) observed in their research "that 62,5% of the patients who showed bloodstream infection used the CVC for more than 21 days", and more than half of the patients used the catheter for a period of 7 days and didn't show ICS.

The results can be seen in PICTURE2:

3.2. Picture 2 – Hospitalization time and permanence of CVC



Source: Researcher's data, 2015.

In regard to the preventive measures against bloodstream infection, the activities in the three periods of the day were evaluated, and the results are the following. About the adherence to hand sanitization the results were: Night shift 208(99,05%), afternoon shift 207(98,57%) and morning shift 207(97,18%). Whereas non-adherence to hand sanitization increased in the morning shift, with 6(2,82%), afternoon 3(1,43%) and night 2(0,95%). The data above, demonstrates a difference among the three periods, as the hand sanitization happened more in the period of the night than in the others.

The hand sanitization, according to Viana (2011, p. 362), "aims to remove the dirt, sweat, oiliness, hair, scaly cells and the skin microbiota, interrupting the transmission of infections propagated through contact, and prevention and reduction of the infections caused by cross transmission". The author also says that the hands are considered a reservoir of transmitting agents and during the assistance to the immunosuppressed patient, can transmit several microorganisms through the direct and indirect contact.

In regard to disinfection of connectors the result was: night shift 209 (99,52%), morning shift 207(97,18%) and afternoon shift 206(98,10%), as effectiveness of the preventive measures, yet the non-disinfection of connectors happens in the morning at this rate: 6(2,82%), afternoon 4(1,90%) and night 1(0,48%), also observing an increase in the preventive measures at night.

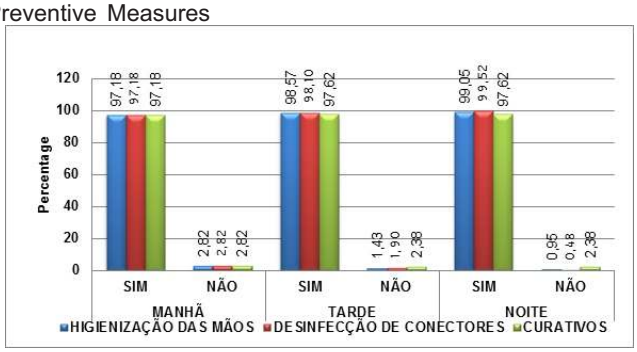
Santos; Zago; Giaretta (2013, p. 120) describes that "It's necessary to check the expiration time of the catheter daily, do the disinfection of connectors before being accessed, adequate-looking coverage (clean and without humidity), change of infusion system in the proper time and identification of the date of change of infusion system".

Regarding the bandages, it was found that those remained still until their change, every 7 days, well fixed with transparent medical dressing (Tegaderm), clean and with no phlogistic signs, being linear in the efficacy of preventive measures during the morning period 207(97,18%), afternoon 205(97,62%) and night 205(97,62%). Consequently, few bandages were humid, with bleeding or secretion before the 7 days, thus being necessary to be changed in the morning 6(2,82%), afternoon 5(2,38%) and night 5(2,38%).

For Mesiano and Hamann (2007, p. 4) "The advantage of the transparency is that it allows the visualization of the inserting orifice, promotes a barrier against dirt and the changes are less frequent, once it favors the constant evaluation by the health professional".

The results can be seen in PICTURE 3:

3.3 Picture 3 – Preventive Measures



Source: Researcher's data, 2015.

CONCLUSION

In light of what was discussed, we can conclude that the central venous catheter is of utmost importance in the hospital environment, mainly in the ICU, but their use can lead to a high index of infection.

Facing the importance of the context, this project aims to contribute with CCIH showing the results of the research, so that they keep elaborating actions of prevention of ICS.

Thus, it is essential that the CCIH together with the nurses, have educational programs, as well as it helps raise the awareness towards the importance of the preventive measures, avoiding, this way, high index of infection, complications and death during the hospitalization.

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BLOODSTREAM INFECTION IN PATIENTS WITH CENTRAL VENOUS CATHETER HOSPITALIZED IN AN INTENSIVE CARE UNIT

ABSTRACT

INTRODUCTION: The intensive care unit (ICU) is a complex structure that offers advanced support of life to potentially serious or unbalanced patients. These need continuous monitoring and become exposed to a series of risks that can contribute to worsen even more their general condition, facilitating the installation of infectious processes. Thus, the invasive procedures are constantly performed in the treatment to patients hospitalized in the ICU, and the central venous catheter is indispensable to help to help improve the general condition of the patient (LIMA; ANDRADE; HAAS; 2007). For Marino (2008, p. 105) “The term central venous catheter refers to the catheter which is projected for the cannulation of the da subclavian vein, the internal jugular vein or the femoral vein”. OBJECTIVES: To evaluate the incidence and the factors that offer risk of bloodstream infection in patients with central venous catheter double lumen (CVC). MATERIALS AND METHODS: It is a field, documental, exploratory, and descriptive of quantitative approach research. RESULTS AND DISCUSSIONS: Among the 20 patients observed only 1 (5%) has had the infection and was affected by the microorganism Staphylococcus epidermidis. Out of the 20(100%) patients, 11(55%) didn't show late complications, but the others had: 7(35%) hyperemia, 1(5%) worse lab exams and 1(5%) pneumothorax. Related to complications in the subclavian insertion, pneumothorax was observed as an immediate complication 1(4,76%) and hyperemia and worse lab exams as late complications 9(42,85%). In the insertion in the jugular there weren't immediate complications, however, there were late complications: 4(66,66%) hyperemia. With regard to the preventive measures, the professionals from the night shift were the ones who adhered most to hand sanitization, and disinfection of connectors, whereas the bandage change was more often performed by the afternoon and night shift professionals. CONCLUSION: In conclusion, the use of CVC can lead to a high level of infection and complications, so educational programs that aim at the application of preventive measures are necessary.

KEYWORDS: Infection; bloodstream; central venous catheter.

INFECTION DE LA CIRCULATION SANGUINE CHEZ LES PATIENTS EN UTILISANT CATHÉTER VEINEUX CENTRAL HOSPITALISÉS DANS UNE UNITÉ DE SOINS INTENSIFS

RÉSUMÉ

INTRODUCTION: L'Unité de soins intensifs (USI) est une structure complexe qui fournit un soutien de la vie de pointe aux patients potentiellement graves ou décompensés. Celui exige un suivi continu et est exposé à un certain nombre de risques qui peuvent contribuer à aggraver leur état général, facilitant l'installation des infections. Ainsi, des procédures invasives sont réalisées systématiquement dans le traitement de patients hospitalisés en soins intensifs, et le cathéter veineux central est essentiel pour aider à améliorer l'état général du patient (LIMA; ANDRADE; HAAS, 2007). Selon Marino (2008, p. 105) "Le terme cathéter veineux central se réfère au cathéter qui est conçu pour une canule dans la veine sous-clavière, dans la veine jugulaire interne ou la veine fémorale." OBJECTIFS:Évaluer l'incidence et les facteurs de risque d'infection de la circulation sanguine chez les patients utilisant un cathéter veineux central à double lumière (CVC). MATÉRIEL ET MÉTHODES: Il s'agit d'une recherche sur le terrain, documentaire, exploratoire, descriptive avec l'approche quantitative. RÉSULTATS ET DISCUSSIONS: Parmi les 20 patients observés seulement 01 (5%) a eu une infection et a été affecté par le microorganisme Staphulococcusepidermidis. des 20 patients (100%), 11 (55%) n'ont présenté aucun complication tardive, mais les autres ont présenté: 7 (35%) hyperémie, 1 (5%) aggravation des tests de laboratoire et 1 (5%) pneumothorax. Les complications liées à l'insertion sous-clavière a été observée 1(4,76%) complication immédiate pneumothorax et 9 (42,85%) complications tardives hyperémie et l'aggravation des examens. En insertion jugulaire, il n'y a pas eu de complications immédiates, mais il y a eu des complications tardives: 4 (66.66%) hyperémie. Comme mesures préventives, les professionnels de la nuit ont été ceux qui ont eu plus de respect de l'hygiène des mains et désinfection des connecteurs, mais comme un changement de pansement les profissionels d'après-midi et nuit ont eu plus de respect. CONCLUSION: On peut conclure que l'utilisation de CVC peut conduire à un taux élevé d'infection et de complications, nécessitant l'utilisation de programmes éducatifs visant à la mise en œuvre de mesures préventives.

MOTS-CLÉS: Infection; Circulation Sanguine; Cathéter Veineux Central.

INFECCIÓN DE LA CORRIENTE SANGUÍNEA EN PACIENTES CON USO DE CATÉTER VENOSO CENTRAL HOSPITALIZADOS EN UNA UNIDAD DE TERAPIA INTENSIVA

RESUMEN

INTRODUCCIÓN: La Unidad de Terapia Intensiva (UTI) es una estructura compleja que ofrece soporte avanzado de vida a los pacientes potencialmente grave o descompensado. Ése necesita de monitorización continua y queda expuesto a una serie de riesgos que puede contribuir para agravar aún más su estado general, facilitando la instalación de procesos infecciosos. De esta manera, los procedimientos invasivos son realizados constantemente en el tratamiento a los pacientes hospitalizados en la UTI, siendo el catéter venoso central indispensable para auxiliar en la mejora del estado general del paciente (LIMA; ANDRADE; HAAS; 2007). Para Marino (2008, p. 105) “El término catéter venoso central se refiere al catéter que es proyectado

para canulación de la vena subclavia, de la vena yugular interna o de la vena femoral". OBJETIVOS: Evaluar la incidencia y los factores de riesgo de infección de la corriente saguínea en pacientes con uso de catéter venoso central doble lumen (CVC). MATERIALES Y MÉTODOS: Se trata de una investigación de campo, documental, tipo exploratoria, descriptiva con abordaje cuantitativo. RESULTADOS Y DISCUSIONES: Dentre los 20 pacientes observados solo 01 (5%) tuvo infección y fue acometido por el microorganismo Staphulococcus epidermidis. De los 20 (100%) de los pacientes, 11 (55%) no presentaron complicaciones tardías, pero los demás presentaron: 7 (35%) hiperemia, 1 (5%) empeora en los exámenes de laboratorio y 1 (5%) neumotórax. Relacionado a las complicaciones en inserción subclavia fue observado como complicación inmediata neumotórax 1 (4,76%) y complicaciones tardía hiperemia y empeora de los exámenes 9 (42,85%). En la inserción de la yugular no hubo complicaciones inmediatas, pero hubo complicaciones tardías: 4 (66,66%) hiperemia. Cuanto a las medidas preventivas, los profesionales de la noche fueron los que tuvieron más adhesión a la higienización de las manos, desinfección de conectores, y el cambio de curativo tuvo más adhesión los profesionales de la tarde y noche. CONCLUSIÓN: Se concluye que el uso del CVC puede llevar a un alto índice de infección y complicaciones, siendo necesaria la utilización de programas educativos que objetiven a la aplicación de las medidas preventivas.

PALABRAS CLAVE: Infección; corriente sanguínea; catéter venoso central.

INFECÇÃO DA CORRENTE SANGUÍNEA EM PACIENTES COM USO DE CATETER VENOSO CENTRAL HOSPITALIZADOS EM UMA UNIDADE DE TERAPIA INTENSIVA

RESUMO

INTRODUÇÃO:A Unidade de Terapia Intensiva (UTI) é uma estrutura complexa que oferece suporte avançado de vida aos pacientes potencialmente grave ou descompensado. Esse necessita de monitorização contínua e fica exposto a uma série de risco que pode contribuir para agravar ainda mais o seu estado geral, facilitando a instalação de processos infecciosos. Desta forma, os procedimentos invasivos são realizados constantemente no tratamento aos pacientes hospitalizados na UTI, sendo o cateter venoso central indispensável para auxiliar na melhoria do estado geral do paciente (LIMA; ANDRADE; HAAS; 2007). Para Marino (2008, p. 105) "O termo cateter venoso central se refere ao cateter que é projetado para canulação da veia subclávia, da veia jugular interna ou da veia femoral". OBJETIVOS:Avaliar a incidência e os fatores de risco de infecção da corrente sanguínea em pacientes com uso de cateter venoso central duplo lúmen (CVC). MATERIAIS E MÉTODOS: Trata-se de uma pesquisa de campo, documental, tipo exploratória, descritiva com abordagem quantitativa. RESULTADOS E DISCUSSÕES:Dentre os 20 pacientes observados apenas 01 (5%) teve infecção e foi acometido pelo microrganismo Staphulococcusepidermidis. Dos 20(100%) dos pacientes, 11(55%) não apresentaram complicações tardias, porém os demais apresentaram: 7(35%) hiperemia, 1(5%) piora nos exames laboratoriais e 1(5%) pneumotórax. Relacionado as complicações em inserção subclávia foi observado como complicação imediata pneumotórax 1(4,76%) e complicação tardia hiperemia e piora dos exames 9(42,85%). Na inserção da jugular não houve complicações imediatas, porém houveram complicações tardias: 4(66,66%) hiperemia. Quanto as medidas preventivas, os profissionais da noite foram os que tiveram mais adesão à higienização das mãos, desinfecção de conectores, já a troca de curativo teve mais adesão os profissionais da tarde e noite. CONCLUSÃO:Conclui-se que o uso do CVC pode levar a um alto índice de infecção e complicações, sendo necessário à utilização de programas educativos que visem à aplicação das medidas preventivas.

PALAVRAS-CHAVE: Infecção; corrente sanguínea; cateter venoso central.