

IMPROVING A BETTER NURSE PRACTICE ASSOCIATED WITH THE MANIPULATION OF CVC AND NEEDLELESS CONNECTORS

José Manuel Martinez

Corresponding Author: Clinical Nurse Specialist/ Master Science in Oncology/ Hematology–Oncology Department of Portugues Institute of Oncology Porto.

jmmartinez@ipoporto.min-saude.pt

Flavia Neves

Registered Nurse/ Hematology–Oncology Department of Portugues Institute of Oncology Porto.

Joana Sousa

Registered Nurse/ Hematology–Oncology Department of Portugues Institute of Oncology Porto.

Denise Santiago

Registered Nurse/ Hematology–Oncology Department of Portugues Institute of Oncology Porto.

Debora Rodrigues

Registered Nurse/ Hematology–Oncology Department of Portugues Institute of Oncology Porto.

Miguel Mendes

Registered Nurse/ Hematology–Oncology Department of Portugues Institute of Oncology Porto.

Diana Ramada

Clinical Nurse Specialist/ Master Science in Oncology/ Day Hospital of Portugues Institute of Oncology Porto.

Teresa Azevedo

Head Nurse/ Hematology–Oncology Department of Portugues Institute of Oncology Porto.

RESUMO: Com o aumento do número, frequência e duração dos tratamentos de quimioterapia, o incremento do uso de cateteres centrais de longa duração permitiu a administração de terapia intravenosa, suporte transfusional e colheita sanguínea de uma forma mais segura e eficaz. Uma das recomendações para manipular o CVC em segurança foi o uso de conectores sem agulha, sendo fundamental o conhecimento das implicações desses dispositivos na prática de enfermagem.

Objetivo: Este estudo visa melhorar a prática associada à manipulação do CVC, usando um duplo conector sem agulha, numa população de pessoas com leucemia aguda (LA) submetidos a quimioterapia de altas doses.

Métodos: Foi realizado um estudo comparativo prospetivo unicêntrico, incluindo uma amostra consecutiva de todas as pessoas diagnosticadas com LA, portadoras de CVC tipo Hickman®, com conector sem agulha simples (SSNC) (grupo 1) ou duplo conector sem agulha (DSNC) (grupo 2), em fase de quimioterapia ou aplasia, desde dezembro de 2014 a dezembro de 2016, na Unidade de Onco-Hematologia do Instituto Português de Oncologia do Porto.

Resultados: No total, foram estudados 17 pessoas com LA que reportaram 78 internamentos [mediana 4, intervalo 1 a 12], 1.122 dias de admissão [mediana de 12.5, intervalo 3 a 44] e 1.044 dias de CVC [mediana 12, intervalo de 3 a 35]. Não foi encontrado nenhum risco estatisticamente significativo de infeção associada ao CVC entre os grupos de estudo [RR 0.4528, IC 95%, 0.1235-1.6605], no entanto, aquando da identificação de colonização da linha central esta reportava-se sempre ao grupo 1. Todas as hemoculturas positivas foram reportadas em períodos de neutropenia. Nenhuma infeção relacionada com o CVC foi identificada.

Conclusão: O estudo sugere que o DSNC pode ser uma boa escolha para a prática de enfermagem de forma a reduzir o risco de colonização do cvc e melhorar a segurança da sua manipulação em pessoas com LA submetidos a quimioterapia em altas doses.

PALAVRAS-CHAVE: Conector sem agulha; Leucemia Aguda; CVC; CLABSI.

ABSTRACT: *Background: With the increase in the number, frequency and duration of treatments,*

long-term catheters were needed to allow different and continuous administration of intravenous therapy, transfusion support and blood sampling. Since many years, the use of needleless connectors is recommended on central-lines access, being crucial the knowledge of the implications associated with the use of these long terms central venous catheters (CVC).

Purpose: This study aims the improvement of the CVC management, using a double lumen extension line with needleless connectors, in acute leukemia (AL) patients population undergoing high dose chemotherapy treatments.

Methods: A single-centre, prospective comparative study was performed, including all consecutive AL patients using a long-term double lumen silicone CVC (commonly named Hickman® type), with single access (group 1) or double lumen extension with needleless connectors (group 2), undergoing chemotherapy treatment (CT) or aplasia support from December 2014 to December 2016 at the Haematology Department of the Portuguese Institute of Oncology of Porto.

Results: Overall 17 AL patients reporting 78 hospital admissions [median 4, range 1 to 12], 1.122 admission days [median of 12.5, range 3 to 44] and 1.044 CVC-days [median 12, range 3 to 35] were studied. Considering the central line reports, no significant CLABSI risk was determined between study groups [RR 0.4528, 95 % CI, 0.1235-1.6605], however, the central line colonization was always reported in the SSNC group. All positive blood cultures were reported undergoing neutropenia. None CRBSI was identified.

Conclusion: The study suggests that the DSNC can be a good option to the nursing practice that aims the reduction of the central line colonization risk and improves a safety CVC management in AL patients undergoing high dose chemotherapy.

Keywords: *Needleless connector; Acute Leukemia; CVC; CLABSI.*

Introduction

In 1929 Werner Forssmann discovered a new safety method in animals to introduce cardio-active drugs inserting a long urinary catheter via the antecubital fossa to the heart. He was awarded in 1956 with the Nobel Prize (Levin SM, 2014); this was considered the first step in the journey of the central venous catheters (CVC). With the fast growth of the type and number of treatments, new kind of long-term catheters were needed which could support the administration of intravenous therapy, transfusion support and blood sampling (Martinez JM, et al, 2015). The Hickman® catheter type is a cuffed double lumen long-term silicone central venous catheter, which commonly is placed percutaneously in the subclavian or internal jugular vein. Usually the 2 lumens differ in terms of the internal

diameters, presenting a wider lumen (can be used for transfusional support or total parenteral nutrition) and another with a smaller diameter.

Associated to all CVC's, infections and occlusions can be considered the most important complications associated with the CVC management. In the particular case of Acute Leukemia (AL) patient population, the neutropenia condition increases the number of CVC manipulations (more blood samples, transfusion support and blood cultures collection) leading to a higher risk of CLABSI (central line associated bloodstream infection) (Martinez JM, et al, 2018). When the CVC is considered the infection source, it is reported CRBSI (catheter-related bloodstream infection), being the most important cause and indication for CVC removal (Mermel LA, 2011).