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ORIGINAL ARTICLE

RELATED COMPLICATIONS WITH THE USE OF FULLY IMPLANTED CENTRAL VENOUS CATHETER IN PATIENTS WITH ONCOLOGICAL TREATMENT COMPLICAÇÕES RELACIONADAS AO USO DO CATETER VENOSO CENTRAL TOTALMENTE IMPLANTADO POR PACIENTES EM TRATAMENTO ONCOLÓGICO COMPLICACIONES REALCIONADAS AL USO DEL CATÉTER VENOSO CENTRAL TOTALMENTE IMPLANTADO POR PACIENTES EN TRATAMIENTO ONCOLÓGICO

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ABSTRACT

Objective: to understand the relationship between handling practices and related complications fully implanted central venous catheter (CVC-TI) in patients undergoing cancer chemotherapy. **Method:** descriptive, documentary qualitative study conducted in the catheter Clinic of the High Complexity in Oncology Care Center/CACON in Alagoas/AL. The research had the project approved by the Research Ethics Committee, CAAE No. 22872313.4.0000.5013. **Results:** it was found that the main complication is obstruction. Regarding complications related to catheters, there were identified issues related to safety and complications related to the CVC-TI; methods used by professionals to minimize complications; understanding of nursing functions of encouragement, guidance and care for the CVC-TI and observations factors involved the practice of catheter handling. **Conclusion:** the data reinforce the importance of nursing activities for the prevention and control of such complications. **Descriptors:** Central Venous Catheter; Complications; Nursing.

RESUMO

Objetivo: compreender a relação entre as práticas de manipulação e as complicações relacionadas ao cateter venoso central totalmente implantado (CVC-TI) em pacientes sob tratamento oncológico quimioterápico. **Método:** estudo descritivo, documental, com abordagem qualitativa, realizado no Ambulatório de cateter do Centro de Assistência de Alta Complexidade em Oncologia/CACON, em Alagoas/AL. A pesquisa teve o projeto aprovado pelo Comitê de ética em Pesquisa, CAAE nº 22872313.4.0000.5013. **Resultados:** verificou-se que a complicação predominante foi a obstrução. Com relação às complicações relacionadas aos cateteres, foram identificados temas relacionados à segurança, às intercorrências e às complicações relacionadas ao CVC-TI; métodos utilizados pelos profissionais para minimizar as complicações; compreensão das funções do enfermeiro sobre incentivo, orientações e cuidados referentes ao CVC-TI e observações de fatores intervenientes à prática do manuseio de cateter. **Conclusão:** os dados reforçam sobre a importância das atividades do enfermeiro visando à prevenção e controle de tais complicações. **Descritores:** Cateter Venoso Central; Complicações; Enfermagem.

RESUMEN

Objetivo: comprender la relación entre las prácticas de manipulación y las complicaciones relacionadas al catéter venoso central totalmente implantado (CVC-TI) en pacientes sobre tratamiento oncológico de quimioterapia. **Método:** estudio descriptivo, documental con enfoque cualitativo realizado en un Ambulatorio de catéter del Centro de Asistencia de Alta Complejidad en Oncología/CACON, en Alagoas/AL. La investigación tuvo su proyecto aprobado por el Comité de ética en Investigación, CAAE nº 22872313.4.0000.5013. **Resultados:** se verificó que la complicación predominante fue la obstrucción. Con relación a las complicaciones relacionadas a los catéteres, se identificaron temas relacionados a la seguridad y complicaciones relacionadas al CVC-TI; métodos utilizados por los profesionales para minimizar las complicaciones; comprensión de las funciones del enfermero sobre incentivo, orientaciones y cuidados referentes al CVC-TI y observaciones de factores implicando la práctica del manoseo del catéter. **Conclusión:** los datos refuerzan sobre la importancia de las actividades del enfermero visando a la prevención y control de tales complicaciones. **Descriptores:** Catéter Venoso Central; Complicaciones; Enfermería.

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INTRODUCTION

In recent decades, cancer has gained a larger dimension, becoming an evident problem of global public health. The World Health Organization (WHO) estimated that in the year 2030, 27 million cases of cancer incidents, 17 million deaths from cancer and 75 million people alive every year with cancer can be expected.¹

Despite all the advances in research published in recent years, the basis of cancer treatment continues based on three areas: surgery, radiotherapy and chemotherapy. The choice of one of these treatment modalities vary according to the type of tumor, level of staging and physical condition of the patient, but antineoplastic chemotherapy is seen as an extremely promising treatment modality characterized by a systemic antitumor property.²

Individuals with cancer, in addition to chemotherapy regimens also make multiple infusions of intravenous medications and frequent examinations collections. Such conditions make them live with limited venous access. The constant use of peripheral venous network that usually is done by punching using needles and polyethylene catheter leads to exhaustion of this venous system, causing intrinsic limitations as venous sclerosis, peripheral phlebitis and extravasation.³

In this way, by adapting the central venous catheter, it was possible to create a totally implantable central venous catheter (CVC-TI) also known as port-a-cath, with numerous benefits for patients. The subcutaneous reservoir (device) allows its carrier having a normal life, performing any task in their daily life and thus a safe and effective venous access, bringing comfort, ensuring frequency and rate of administration of medications.⁴

Some complications arise from its use, such as infection, obstruction, infiltration or extravasation, among others. Some of these events can be treated, but not always removing the CVC-TI can be avoided.⁵ The handling of the CVC-TI requires qualified nurses with adequate theoretical and practical knowledge, providing both for the nurse and the patient safety and quality.⁶

Among the nursing care in handling the CVC-TI there are the pre and post-operative assistance, dressings and handling of the device, drug administration and maintenance of permeability. It is also noteworthy the responsibility of both the professional and the patient on the device care, to its permanence and achievement of therapeutic goals.⁵

It is justified to consider that with the diagnosis of cancer patients change their lives, suffering as well, with the losses that cancer brings. Understanding any mechanisms that can alleviate the pain and suffering arising from this impressive disease, especially when its complexity, its risks and its diversity are known, it is relevant to health professionals that aims to provide qualified service, including nurses, because they are the main caregivers related to these CVC-TI, in order to prevent early removal and even delays in cancer treatment.

This study aimed to:

- Understand the relationship between handling practices and complications related to central venous catheter fully implemented (CVC-TI) in patients undergoing cancer chemotherapy.

METHOD

Descriptive and documentary study with a qualitative approach, using descriptive statistics and thematic analysis. Data were analyzed, emerging figures and content that formed the essence of the analysis seeking to investigate the occurrence of complications related to the CVC-TI. To meet the technical pole, it was decided to interview nurses of the area. These interviews were analyzed, presented and organized in summary form, which allowed the construction of thematic categories.

The study was conducted in the Catheter Clinic, being part of the Assistance Center of High Complexity in Oncology (CACON), located at the University Hospital Professor Alberto Antunes, of the Federal University of Alagoas-HUPAA/UFAL where services are provided through funding by the Unified Health System (SUS).

The sample consisted of seventy-one records of patients who carry CVC-TI and were subjected to manipulation from December 2008 to December 2013. Out of them, eight were eliminated from the study after applying exclusion criteria for having incomplete information, being records of children or who were outside the data collection period. There were also part of the research six nurses belonging to the chemotherapy sector, handling the CVC-TI and who agreed to participate. Other nurses who have had training on the CVC-TI, but rarely manipulated CVC-TI were excluded.

The age of the research subjects ranged from twenty-eight to fifty-five years old, all female and experience equal or greater than eight months of work in the area and have

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been identified by the letter “S” followed by the number “1” to “6”.

The nurses were invited to participate in the research voluntarily and free, reading the Informed Consent and Informed - TCLE, seeking to void any doubt in understanding the information. Resolution No. 466/12 of the National Health Council has been respected, which regulates research involving human beings, ensuring the rights and duties as they relate to scientific group and the research subjects.

Data collection occurred through two instruments developed by researchers such as a structured questionnaire to records and folders of patients with the following variables: gender, age, type of cancer, data on the CVC-TI and complications associated with the use of catheter. The other questionnaire is semi-structured, used to interview the subject, with specific data to characterize the sample, containing the following variables: gender, age group and

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questions related to complications from the perspective of nurses who handle the CVC-IT.

The project was approved by the Research Ethics Committee/UFAL whose number Presentation of Ethics Certificate of Appreciation is (CAAE) 22872313.4.0000.5013

RESULTS AND DISCUSSION

The advantages of using the CVC-IT in oncology are primarily focused on safety in chemotherapy administration. However, despite ensuring secure access, some complications are inherent to its use.⁵

There were 63 records analyzed and in 11 of these complications were observed which corresponds to 17,5% of the sample. The results of such complications can be observed in graph-1. It is observed that obstruction is shown in greater numbers among those presented.

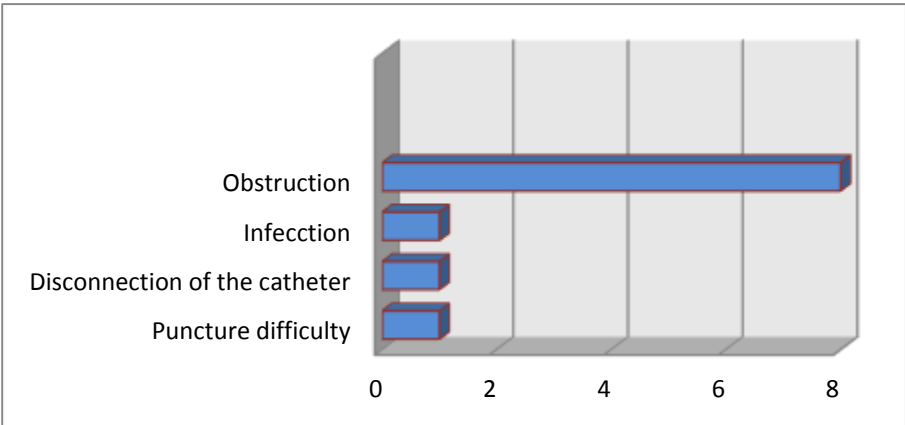


Figure 1. Complications incidence according to the type found - CACON, 2008-2013.

A possible classification is to distinguish the partial obstruction, whose flow is preserved, enabling the infusion of fluids; and the total obstruction in which there is full flow or reflow.⁷ The change in the physiology of coagulation may contribute somewhat to higher incidence of obstruction of CVC-TI.⁸ We have to consider that cancer patients are more likely to develop thrombus due to the hyper-coagulation state identified in this population. There is a triad contributing to abnormalities in coagulation, such as the production of pro-coagulating factors by neoplastic tissue, therapies and interventions used in the clinical treatment of cancer.⁸

Compared to this report⁵, aimed to identify the most frequent complications, in descending order, infection, thrombosis, obstruction, hematoma, malposition, bacteremia, extravasation and pneumothorax. Thus, the results of this study show a higher obstruction level than that shown by the comparative study, followed by infection,

catheter disconnection and difficult puncture after weight gain.

A qualitative view at the research regarding the complications related to the CVC-IT from the perspective of nurses who handle the devices, data analysis enabled the construction of the following thematic categories: Security, complications and complications related to the CVC-IT; methods used by professionals to minimize complications; understanding of nursing functions of encouragement, guidance and care for the CVC-TI and observations of intervening factors to practice handling the CVC-IT.

• Security, complications and complications related to the CVC-IT:

In this category questions about the experience of a situation in which there was problem identification and solving were also grouped.

[...] t ils more secure because it is a fully inserted catheter [...] catheters offer some

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risks, right? One of them is infection, but this risk is related to the person who handles it. (S2)

Certainly, much safer and prevent some complications [...] it is an invasive procedure, right? Although the handling is done only by professionals, but it is an invasive procedure. (S3)

It is understood by the perception of safety risks being separated or loss is the absence of risks⁹ It was evident in the above statements, all participants recognize that catheters are invasive devices and are therefore risky. However, they can become safe when properly handled.

The CVC-IT provides a safe venous access because, when properly installed and handled, allows the realization of intravenous therapy using drugs with extremes of pH and osmolarity without risk of venous endothelium injury when the administration by peripheral way.¹⁰

♦ Methods used by professionals to minimize complications

This category addressed the ways of acting and questions about the local/environment where the catheters are manipulated.

[...] If there is an obstruction we still try to unblock it with vitamin C [...] other than that, we headed for the vascular surgeon [...] in the case of infection there is both systemic antibiotic as antibiotic location [...]. (S2)

[...] Initially it is an empty syringe with negative pressure, then with serum, then with heparin solution and finally we streptokinase that we never had to do here because it is very anaphylactic we only do it in the presence of the doctor right? (S6)

Each one acted according to the complication found to solve the problem. It is observed the attempt at unblocking with ascorbic acid (vitamin C) and the use of heparin to attempt at unblocking. In case of major complications, both subjects refer to the vascular surgeon.

Although no solid studies were identified to guide the use of ascorbic acid (vitamin C), in a recent publication, INCA guides the use of 02 ml of ascorbic acid associated with aspiration maneuvers if it is not possible to release the track with physiological serum 0.9%.¹⁰ The results of a retrospective study presented at a national event demonstrated patency rate of 96% of catheters treated with this substance.¹¹

It is known that CVC-IT manipulation is performed in its own rooms with all the technical conditions of hygiene, against contamination. The data obtained in the interview associated with the observation of

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such characteristics, are clearly explained in the following lines:

[...] Yes, actually we had only one contamination because we were using the catheter clinic room to assess patient's ostomy [...]. (S1)

Surely, there must be a suitable environment just to maintain this catheter [...]. (S3)

[...] It cannot be manipulated in a contaminated environment, with contamination. (S6)

All subjects argue that the environment can interfere or influence the occurrence of complications and they further state that the environment has to be appropriate.

The goal of catheter clinic is the centralization of activities related to catheters, in order to ensure the quality of care for continued treatment, increasing thereby the length of stay, fewer complications and risks of infection.¹⁰

Regarding to what should be changed in the area to avoid complications, the lines are developed as follows:

[...] The thing is only training and training people who manipulate the catheter. If you train and mentor the right technique, you can get it. (S1)

I think it's to keep what we have been following, or have a specific room for manipulation of the catheter always training staff, upgrading the right staff? (S2)

[...] Really do the right technique, using sterile equipment, disinfection of the site also appropriately, right? Make all the technique the right way [...]. (S3)

[...] monthly maintenance and patient participating. (S4)

It can be noticed that all subjects emphasize the correct technique as the main requirement to avoid complications. Some subjects also highlighted aspects of the patient and handling time.

Using aseptic technique is critical in the central device of manipulation in order to prevent infection and its complications. Care consist of hand hygiene before and after handling, ostium maintenance occluded output with sterile dressing, disinfection of connections before opening them with alcoholic antiseptic solution, exchange of extenders every 96 hours, among others care.¹²

In issues addressing the knowledge of Standard Operating Procedure-POP in the area to avoid complications, participants are aware of its existence. The POP of the researched area describes each critical and sequential step to be given by the operator to ensure the

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expected result of the task and also mentions actions in case of non-compliance. There are also described maintenance procedure, activation, deactivation and blood collection through the catheter.

The use of these POPs aims to train health professionals in handling the CVC-IT, minimize the risks associated with use of this device and incorporate care practice.¹³

♦ Understanding of nursing functions of encouragement, guidance and care for the CVC-IT.

Encouragement is understood as stimulation of catheter use. The following lines exemplifies this situation:

[...] It is good for all patients to implant catheter before undergoing chemotherapy. (S1).

Yes. Patients with mastectomy [...] that will make very long cycle. I think this was not even like to discuss? [...]. (S5)

It is observed that the subject agree that the CVC-IT should be encouraged, but it must have inclusion criteria. The guidance to the patient and family must be provided even before catheter insertion, including issues related to what is the catheter, form of implementation, care needed for maintenance and possible complications such as infection, inflammation, pain and presence of secretion on the insertion area.⁵

When the treatment is scheduled duration of more than six months, it is advisable to use the implantable system from the beginning. It also reports that this suffering, today virtually preventable with the implantation of catheters, in the past, made many patients abandoning treatment and surrender to the disease.¹⁴ The decision to implant or not the catheter is not exclusive of the multidisciplinary team and should be considered the participation of the patient.¹⁵

The CVC-TI is also indicated for implants with the goal of lasting more than six months and shall be observed: Patient with difficult peripheral venous access; need for venous access for long periods; long-term chemotherapy: multiple cycles; vesicant drugs or leading to severe aplasia and infusion time above 8 hours.¹⁰

Regarding the guidelines provided to patients and families, we can see a trend of the subjects to focus on local hygiene of the catheter and also the time for maintenance of the catheter, the following lines exemplifies this situation:

[...] a principal orientação é a manutenção a cada 30 dias. (S6)

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[...] Not be fat to not have a displacement of the catheter and be just right due for maintenance. (S1)

[...] The only thing we ask is that he has a good personal hygiene including in the place the catheter is inserted. (S2)

[...] The main thrust is to maintain every 30 days. (S6)

♦ Observations of intervening factors to practice handling the CVC-IT.

Finally, nurses were allowed to manifest their observations related to the theme. Only two subjects mentioned complementary aspects that demonstrate reflection on their own practice and the structuring of the service:

[...] The ideal was that we had a nurse there in the catheter maintenance room, right? [...] This was lost from the time that we took the nurse there by necessity. (S1)

It is observed that the interviewee knows what needs to be done in the area to improve the quality of care and the number of human resources is insufficient and may hinder the work of the service and therefore the patient has disadvantage of it.

This thing gives the catheter orientation, I do not know at what time is done, because I do not also see in our practice [...] I do not see in our practice, patient orientation catheter as we do in chemotherapy! Look, you have to have personal hygiene, soap [...]. (S4)

According to the interviewee, the guidelines for the chemotherapy are real, but not with the catheter. It is clear that professionals in practice does not usually strengthen guidance in relation to the care of the catheter.

CONCLUSION

The recorded complications, the most frequent was obstruction, with eight and then one infection, one disconnection of the catheter and one puncture difficulty after weight gain. The results make clear the importance, the need to maintain the standard techniques, strengthening as the guidance provided to the patient by the nursing staff, which are important for good permeability and quality of CVC-TI, and enables minimize possible unwanted complications.

We also found obstacles related to the notes of the medical records, as this document should contain all relevant information, since the missing or incomplete registration information can generate numerous risks to patients.

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It is necessary besides continuing education, periodic review and update of Standard Operating Procedure manual (POP), with support in the literature since it brings rules of conduct and safety measures for patients and professionals.

It is possible to suggest studies in order to compare the effectiveness of vitamin C (ascorbic acid) in preventing CVC-IT obstruction, since its use is not described in the POP area.

It is important to highlight the difficulty of the Unified Health System (SUS) to maintain a flow of essential materials, harming the patient by increasing complications, factor being independent of the nurse.

The results of this study can contribute with professionals who also work in oncology for deepening the theme in order to direct actions, preventing the occurrence of future complications and providing better during treatment, since patients who use the CVC -TI are susceptible to significant complications that can even determine treatment failure.

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