



CARE NURSING IN THE COLLECTION OF HEMATOPOIETIC STEM CELLS BY APHERESIS

CUIDADO DE ENFERMAGEM NA COLETA DE CÉLULAS-TRONCO HEMATOPOIÉTICAS POR AFÉRESE

CUIDADO DE ENFERMERÍA EM LA RECOLECCIÓN DE CÉLULAS TRONCO HEMATOPOYÉTICAS POR AFÉRESIS

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ABSTRACT

Objective: to standardize nursing care for the collection of hematopoietic stem cells by apheresis. **Method:** documentary and bibliographical study developed for an oncology institution in Santa Catarina, Brazil. Data collection was carried out between October 2011 and February 2012, in documents that standardize the technique at renowned oncological institutions in Brazil and in oncology-hematology textbooks. The collection was directed to the technical steps that make up the procedure investigated. The analysis compared the standardization investigated with the routine of the study setting. **Results:** standard operating procedure was elaborated and nursing staff was trained for the development of the established technique. The preparation procedure involved the participation of professionals who make up the nursing staff of the study setting. **Conclusion:** the standardization and dissemination of the technic optimizes and qualifies the nursing care, considering the reduced number of publications at the national level. **Descriptors:** Nursing; Oncology; Transplantation of Hematopoietic Stem Cells.

RESUMO

Objetivo: padronizar os cuidados de enfermagem para a coleta de células-tronco hematopoiéticas por aférese. **Método:** estudo documental e bibliográfico desenvolvido para instituição oncológica de Santa Catarina, Brasil. A coleta de dados foi realizada entre outubro 2011 e fevereiro de 2012 em documentos que padronizam a técnica em instituições oncológicas renomadas no Brasil e em livros-textos da onco-hematologia. A coleta foi direcionada para as etapas técnicas que compõem o procedimento investigado. A análise comparou as padronizações investigadas com a rotina do cenário do estudo. **Resultados:** elaborou-se um procedimento operacional padrão e a equipe de enfermagem foi capacitada para o desenvolvimento da técnica estabelecida. A elaboração do procedimento envolveu a participação dos profissionais que compõe a equipe de enfermagem do cenário do estudo. **Conclusão:** a padronização e divulgação da técnica otimiza e qualifica o cuidado de enfermagem, considerando o reduzido número de publicações no âmbito nacional. **Descritores:** Enfermagem; Oncologia; Transplante de Células-Tronco Hematopoiéticas.

RESUMEN

Objetivo: estandarizar los cuidados de enfermería para la recolección de células-tronco hematopoyéticas por aféresis. **Método:** estudio documental y bibliográfico desarrollado para uma institución oncológica de Santa Catarina, Brasil. La recolección de datos fue realizada entre octubre 2011 y febrero de 2012, en documentos que estandarizan la técnica en instituciones oncológicas renombradas en Brasil y en libros-textos de oncología-hematología. La recolección fue dirigida para las etapas técnicas que componen el procedimiento investigado. El análisis comparó las estandarizaciones investigadas con la rutina del escenario del estudio. **Resultados:** se elaboró procedimiento operacional estándar y se capacitó al equipo de enfermería para el desarrollo de la técnica establecida. La elaboración del procedimiento envolvió la participación de los profesionales que componen el equipo de enfermería del escenario del estudio. **Conclusión:** la estandarización y divulgación de la técnica optimiza y califica el cuidado de enfermería, considerando el reducido número de publicaciones en el ámbito nacional. **Descriptor:** Enfermería; Oncología; Trasplante de Células-Tronco Hematopoyéticas.

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INTRODUCTION

Hematopoietic stem cell transplantation (HSCT) or bone marrow transplantation (BMT) is used in Brazil for 30 years for the treatment of hematological, oncology, immune and hereditary diseases, aiming to restore bone marrow function. It is a highly complex therapeutic used with the aim to cure or prolong life, increasing the possibility of survival, despite the high rate of morbidity and mortality.¹

HSCT is the replacement of hematopoietic stem cells from normal hematopoietic stem cells obtained in bone marrow, aimed to normalize hematopoiesis and may be allogeneic, syngeneic or autologous, also called autologous. In this study, we will discuss autologous transplant, when hematopoietic stem cells come from bone marrow or peripheral blood from the own individual to be transplanted.²

The collection of hematopoietic stem cells for autologous transplantation is performed after high-dose of chemotherapy and use of a growth factor granulocyte colony. The collection is scheduled according to leukocyte recovery and monitoring the cluster of differentiation 34 (CD34). Obtaining the required minimum score of CD34, the central venous catheter (CVC) caliber is installed to start collecting HSC by apheresis in the hospitalization unit.³

In recent decades, there were significant advances in the development of more accurate diagnostic procedures, more effective apheresis machines, constant development of medications such as immunosuppressant, antibiotics, antifungals and growth factors increasingly powerful, as well as scientific improvement of the multidisciplinary team.¹

This study was held because of institutional need, noticed by nursing professionals and the low number of publications nationally about HSCT. A study published in 2010 found only 37 publications between 1997 and 2007. These studies⁴ do not address the steps for nursing care in the collection of HSC.

Considering the need of permanent education in health services for the success and safety of HSCT and the lack of routine established in HSCT Unit of an institution specialized in oncology assistance of Santa Catarina/Brazil, in operation since 1999, the objective of this study is:

- To standardize nursing care for the collection of hematopoietic stem cells by apheresis.

METHOD

Documentary and bibliographical study from September 2011 to October 2012. Data collection was carried out between October 2011 and February 2012.

The institution of this study has authorization to perform autologous HSC transplantation in Santa Catarina/Brazil. In 10 years this institution has made 386 transplants.

For the documentary study it was asked to the Nursing Coordination of a renowned Brazilian institutions for HSCT to make available the standard operating procedure (SOP) adopted in nursing care during HSC collection.⁵⁻⁸ The institutions contacted were: Hematology and Hemotherapy Center of Santa Catarina (HEMOSC), Clinical Hospital OF the Federal University of Paraná (UFPR), National Cancer Institute (INCA) and Albert Einstein Hospital in São Paulo/SP.

The request was made via telephone and official letter contact. The official letter clarified the intent of the study and the methodological strategy.

To science and authorization of the use of SOPs an authorization form was created. All Coordinators contacted offer SOPs requested.

For the literature review seven oncology-hematology^{1-3,9-12} textbooks were included. These bibliographies were chosen for recognition of professionals working in HSCT.

To collect data in documents and bibliographies, the research was directed to the technical steps that make up the procedure investigated among the institutions involved in the study. In bibliographies collection the justification of the steps and care was also directed.

The findings were registered in files in Microsoft Word Program and grouped by thematic/technique approach.

After collecting the data was analyzed comparing the findings with the routine followed by the nursing professionals in the scenario where this study began. Differences between the technical steps found in the investigated documents and bibliographies were identified. Later, the findings were theorized, and the bibliographies included in this study gave the necessary scientific support for this methodological step.

The theory and the elaboration of SPOP were held together with members of the nursing staff in the scenario where this study was proposed. After this step, professional training was conducted for the development of the new procedure.

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It is noteworthy that, for the elaboration of SOP the model established by the Quality Program was followed, established by the scenario, including: procedure title, issue and review date, goal of the procedure, performer, sector recording, material used, figures, procedure description, observations, register control, name of those responsible for the preparation, review and approval. This model that supported the development of the main objective of this study is the scope of the expected result.

In this study there are only the title of the procedure, required materials, procedure description and observations.

RESULTS

SOP provided by HEMOSC entitled as Infusion of periphery blood progenitor cells⁵ presents in detail the pre-collection stages; scheduling of the procedure; placement of the catheter; examinations; use of growth factors; definition of calculations; technical arrangements of apheresis equipment; description of materials, equipment and procedure; results; responsibilities; safety standards; forms and related documents. The comparative analysis showed that the technical stages are equivalent to those adopted by the institution of this study.

SOP sent by the Clinical Hospital of the UFPR, entitled, Infusion of fresh HSC or therapeutic cells (lymphocytes)⁶ describes in detail the steps of HSCC by apheresis, but is not meant to describe the nursing care during the procedure. The routine of the study scenario presents this description.

SOP sent by INCA entitled, Autogenic/bone marrow/periphery blood⁷ infusion describes the equipment and materials needed; the collection of samples for laboratory examination to be conducted; the peripheral access for apheresis in the patient/donor, mentioning the placement of CVC, if necessary; addressing the care with biological material.

SOP sent by Albert Einstein Hospital, entitled, Infusion of frozen stem cells: nursing care⁸ did not contribute to this study, as it refers to the infusion of HSC and nursing care was also investigated by this study in the collection of HSC by apheresis.

In the literature review and bibliographies investigated there was the active participation of nurses in the mobilization of HSC, promoting the interaction of team members, care for chemotherapy, central venous catheter, infection risks, monitoring of laboratory tests, hematopoietic growth factor

administration, among others. However, none of bibliographies investigated described the specific nursing care in the collection of HSC by apheresis. This finding shows the need for the Brazilian oncology nursing produce and publish knowledge on the topic.

After the comparative analysis stage and the literature review, SOP titled *Nursing Care in Hematopoietic Stem Cell Collection by Apheresis* was created. After consensus of the nursing staff of the unit, SOP has been reviewed by the Nursing Coordination in the Unit and approved by the Nursing Management.

The procedure was described in two stages and included the responsibilities of nurses and nursing technicians and some responsibilities of the medical professional hemotherapist and/or blood center's nurse. At this stage, the team associated the findings of the investigation, the routine followed by the development of this study, the competence gained from over ten years of experience in HSCT and technical recommendations found in textbooks.

The responsibilities of the blood center professionals were included for the connection with the activities of the HSCT nursing staff.

Below, there are the required materials for execution of the procedure, procedure description and technical observations.

Materials:

First Tray - collection beginning

- Procedure gloves (2 pairs); 10 ml syringes (2 units); dry gauze soaked in 70% alcohol; collection tube for laboratory examination, one with EDTA anticoagulant and two dry tubes previously identified with ID tags generated by the computer system of the unit registering: name, birth date, affiliation, registration, diagnosis, inpatient unit and origin, include date, time and responsible for the collection; plastic bag for dismissing the material.

Second Tray - collection finishing

- Procedure gloves (2 pairs); 20-ml syringe filled with physiological saline (FS) 0.9% (2 units); syringe with 3 ml of 5000 IU/ml pure identified heparin; scotch tape; and dry gauze soaked in 70% alcohol; sterile caps (2 units); plastic bag for dismissing the material.

Procedure description:

First step: Collection beginning

- Wash hands;
- Gather the materials from the first tray;

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- Advise the patient and family about the procedure;
- Advise the patient to communicate the reactions felt, such as tingling, cold, headache, low blood pressure, dizziness, nausea, vomiting, anxiety, feeling sick, cramps, tremors, chills, among others.
- Position the patient lying as comfortable as possible;
- Expose only the insertion site of the CVC and lumens;
- Sanitize hands with alcohol gel at the moment of care;
- Have the material prepared in order to facilitate the following procedure;
- Put on the procedure gloves;
- Sanitize the connections externally with gauze soaked in 70% alcohol before handling;
- Adapt the 10 ml syringe in the proximal lumen, remove clamps from the system, aspire 8 ml of blood for dismiss, clamp the lumen, disconnect the syringe, connect the adapter to collect blood sample to perform laboratory examination, insert the tubes and wait to fill; remove the adapter and homogenize each tube previously identified; connect the lumen to the collection system already installed on the machine that will suck the blood apheresis, programmed by hemotherapist doctor or blood center's nurse;
- Adapt the 10 ml syringe in the medial lumen, remove clamps from the system, aspire 8 ml of blood for dismiss, clamp the lumen, disconnect the syringe, connect the lumen to the collection system already installed on the machine that will infuse the blood after apheresis,
- Continuously monitor the patient and the adverse reactions;
- Discard and/or save the materials used in recommended location;
- Wash hands;
- Make notes of the procedure in the patient's record;

Second stage: collection finishing

- Wash hands;
- Gather the materials of the second tray;
- Guide the patient and family about the procedure;
- Expose only the insertion site of the CVC and lumens;
- Sanitize hands with alcohol gel at the moment of care;
- Have the material prepared in order to facilitate the following procedure;
- Put on the procedure gloves;

- Sanitize the connections externally with gauze soaked in 70% alcohol before handling;
- Clamp the proximal lumen, disconnect the collection system, adjust the 20 ml syringe filled with 0.9% physiological saline injected with positive pressure, clamp the lumen, disconnect the syringe, reinstall the fluid or fill the lumen with pure heparin, 1.2 ml.
- Close the proximal lumen with sterile cap;
- Perform the same steps with the medial lumen, while respecting the volume of the lumen, 1.3 ml.
- Close the medial lumen with sterile cap;
- Protect the ends of heparinized lumens with dry gauze and tape, identifying them with adhesive, writing: "Pure Heparin", date, time and name of the responsible for conducting the procedure;
- Discard and/or save the materials used;
- Wash hands;
- Make notes of the procedure in the patient's record.

Observations:

The nurse is responsible for:

- Performing the steps in the first and second moment of this SOP, being attentive to the care needed in all dimensions of the human being, arising during the collection of HSC;

The nursing technician is responsible for:

- Checking vital signs before and after the HSC collection;
- Keeping the permeability of the distal lumen for monitoring the daily medical prescription;
- Assisting the patient during feeding and evacuations, because he/she will remain in bed throughout the collection process, usually around 4 to 6 hours;
- Managing the electrolyte replacement solution containing FS 500 ml, 1 vial of potassium chloride 19.1%, 1 magnesium sulfate ampoule 10% and 03 ampoules of calcium gluconate 10%, according to medical prescription, in the distal lumen, by infusion pump, concomitant collecting HSCT by apheresis.

The hemotherapist doctor or blood bank nurses - HEMOSC is responsible for:

- Bringing the kit to apheresis and the anticoagulant solution used during data collection;
- Guiding and requesting the signature of the patient in the informed consent form for the therapeutic apheresis procedures;

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- Requesting the necessary laboratory examinations, specific activity of the doctor;
- Performing the programming of the apheresis machine, handling and monitoring throughout the process to the end;
- Carrying (in container itself) the tubes collected for the laboratory examinations and collected bags with the hematopoietic stem cells to Cryobiology Sector of HEMOSC, where they will be prepared for the cryopreservation process.

DISCUSSION

To meet the scientific and technological transformations taking care responsibility includes, , the quality of care, care protocols, patient safety and care over a period of time to ensure effective results for both the patient and the professionals, among other things.¹³⁻¹⁶

The standardization of the HSC collection enables to improve the actions of the scenario nursing service of this study, and serves institutional needs. The systematization of procedures is essential to the pursuit of total quality because it defines the product. Standardization is also the basis for the training of professionals.^{17,18}

For training and improvement of the health team, the Continuing Education must be used. As conceptualizes by the Ministry of Health, this practice is learning at work, where learning and teaching are into the daily lives of organizations and work. It is based on meaningful learning and the possibility of transforming professional practices¹⁹, a fact objectified by this study.

Continuing education is still understood as a learning-work, that is, it happens in everyday life and from the problems faced in reality, taking into account the knowledge and previous experience of people.¹⁹ In this study we concern to involve teamwork in preparing the established procedure, but we also have the experience of other professionals from other Brazilian institutions, considering the experience and the experiences of most experienced teams in the investigated area.

The National Policy on Continuing Education also proposes that health workers' education processes are from the questioning of the work process.¹⁹ This aspect was also thought when defining the object of this study. Thus, it is understood that the study presented here has met the guidelines established by the National Policy of

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Permanent Education in Health, which contributed to the improvement of the nursing staff of the scenario of the study and with the quality of care provided to the person submitted to HSCT .

CONCLUSÃO

This study standardized and optimized nursing care during the HSC collection, helping the needs of patients, the institution, study scenario and the wishes of the members of the multidisciplinary team, highlighting the desire of nurses in searching for a performance competent and humane.

The development of standard operating procedure for nursing care in the collection of hematopoietic stem cell transplantation (HSCT) has established a routine to be followed, free of undesirable variations, and must be completed, updated and revised periodically by all members involved in the process.

O procedimento estabelecido servirá para a capacitação e educação permanente dos profissionais de enfermagem atuantes no TCTH do cenário do estudo ou outros serviços interessados na temática. A divulgação dos procedimentos favorece o intercâmbio do conhecimento produzido, considerando o reduzido número de publicações no âmbito nacional sobre o TCTH.

The established procedure will serve for training and continuing education of nursing professionals active in the study scenario of HSCT or other services interested in the topic. The disclosure of the procedures favor the exchange of knowledge produced, considering the limited number of publications at the national level on the HSCT.

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