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Importance of Nursing Personnel in the Transfusion Chain: From Blood Draw Until Disposal

Importancia del personal de enfermería en la cadena de transfusión: desde la adquisición hasta la disposición final

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Abstract:

Introduction: Nowadays, the role of professional nursing has grown significantly, including responsibilities for various procedures and involvement in the transfusion chain. However, the lack of recognition and respect for their vital contribution in other areas still occur. Objective: To identify those interventions carried out by the nursing professionals in the transfusion therapy process. Material and methods: It was used the Ovid database, designed by the National Cancer Institute, which also redirected to SciElo and Dialnet, using Boolean operators such as "and" and "or", as well as keywords such as nursing, transfusion therapy, nursing interventions, international and national guidelines. Conclusions: The nursing staff has a fundamental role in the transfusion therapy, from the moment in which they explain to the donor the risks, benefits, correct identification of the donor and recipient, as well as the constant monitoring of vital signs before, during and after the transfusion; being part of all the interventions that the nursing staff performs, and that ensure the effectiveness of the entire transfusion process.

Keywords:

Nursing staff, nursing interventions, transfusion therapy

Resumen:

Introducción: Hoy en día el trabajo del profesional de enfermería ha tenido un crecimiento importante, responsabilizándose por diversos procedimientos, entre estos, su participación en la cadena transfusional. Sin embargo, aún falta el reconocimiento de su labor en diversas áreas de trabajo. Objetivo: identificar las intervenciones que realiza el profesional de enfermería en el proceso de la terapia transfusional. Material y métodos: La búsqueda bibliográfica se realizó en la base de datos Ovidds del Instituto Nacional de cancerología, el cual también redireccionó a SciElo y Dialnet, utilizando operadores booleanos como "and" y "or", asimismo palabras clave como enfermería, terapia transfusional, intervenciones de enfermería, en guías internacionales y nacionales. Conclusiones: El personal de enfermería tiene un papel fundamental en la terapia de transfusión, que va desde el momento en el que le explicará al donador los riesgos, los beneficios, identificación correcta del donante y receptor, así como la vigilancia constante de los signos vitales antes, durante y después de la transfusión; siendo forman parte de todas las intervenciones que el personal de enfermería realiza, y que aseguran la eficacia de todo el proceso de transfusión.

Palabras Clave:

Personal de enfermería, intervenciones de enfermería, terapia transfusional

Introduction

Nursing science is still in continuous growth, which is why it is important to support and document our practice in order to

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provide quality care. In transfusion medicine, nursing plays a key role since the moment when the blood tissue is obtained until its final disposal.[1]

In this process, the nursing function is essential in order for the therapeutic effects of transfusion to take place and, hence, along with care provided, guarantee efficacy and quality. Therefore, it is necessary for health personnel to be aware of being involved in this process, but above all, to apply their acquired expertise and know the side effects that may occur in patients during this procedure.[1]

Thus, this paper aims at showing the importance of nursing interventions in the transfusion process. It was used the Ovid database, designed by the National Cancer Institute, which also redirected to SciElo and Dialnet, using Boolean operators such as “and” and “or”, as well as keywords such as nursing, transfusion therapy, nursing interventions, in order to analyze, reflect and deepen the content.

Development

Blood is the fluid of life. No blood, no life. Blood flow is the amount of blood moving through a given point in the circulation during a period of time. The global blood flow of the entire circulation of an adult at rest is about 5,000 ml/min, which is considered equal to the cardiac output, because it is the amount of blood that the heart pumps into the aorta every minute[1]. This depends on the characteristics of each person, age, physical complexion and organic functioning.[1,2]

Blood is a living tissue made up of liquids and solids. The liquid part is called plasma and contains water, salts and proteins, more than half of the body is plasma; while the solid part contains red blood cells, white blood cells and platelets. Blood units are daily required for transfusions for patients with chronic diseases, patients with cancer or anemia, people who are scheduled for surgery or transplantation or those who require an emergency operation due to an accident, burn or hemorrhage[2].

The maximum volume of blood collected on each occasion should be 450ml ± 10% (of total body blood). It should not exceed 10.5 ml per kg of the donor's body weight or 13% of the donor's calculated total blood volume.[3] A unit or volume of blood can save the life of one or up to three people if the fractionation of blood and its components or the mixture of these (erythrocyte and granulocyte concentrates, platelets, plasma, cryoprecipitates) is carried out.[2,3]

Today, blood banks cannot keep up with the demand for blood units, since the World Health Organization (WHO) claims that there are only 14 donations for every 1000 people, meaning the limited availability of this product. On the other hand, it is also intended that altruistic people make donations for blood to be a safe product for those who may need it. Blood donations are needed around the world to ensure that individuals and communities have access to safe and quality blood and blood products, both in normal and emergency situations.[4]

On the other hand, the difficult situation we are facing in terms of donations, due to the lack of support for the initiative from people, lack of donation culture, lack of knowledge regarding the requirements to donate, among others situations[5]. The health personnel should be responsible for this process, since it is a vital tissue, as well as the risk of infection or reactions that may be generated during the process and, above all, use these therapeutic products correctly.

The Article number 4 of the Political Constitution of Mexico recognizes the right to health protection as a fundamental right. This law provides that national public authorities and bodies will adopt the corresponding measures for all people to enjoy, without any discrimination, all the rights and freedoms embodied in the Constitution, laws and international treaties that Mexico has signed, recognizing it as the supreme law of the entire Union, which is why they are considered as part of the national legal order.[6]

Signing and ratification of international legal instruments force the Mexican State to integrate said norms and, where appropriate, modify national laws in order to ensure their correct application. Therefore, Mexico, as a member state of the World Health Organization/Pan American Health Organization (WHO/PAHO) is committed to protect and defend blood safety stated by the resolutions of the Directing Councils of WHO/PAHO, Resolution CD48.R7, which is still in force, issued and approved by the Directing Council of PAHO during the session held in October 2008, where the main theme was "improved availability of blood and the safety of transfusions in the Americas".[6]

The Ministry of Health, through the National Blood Transfusion Center, is the governing body responsible for issuing the National Blood Transfusion Program and running it through the State Centers and State Blood Transfusion Programs. This body has a normative and operational function: the regulation cannot be delegated and refers to elaborating norms, standards of good manufacturing practices, structuring the information system related to blood disposition and blood components, including hematopoietic progenitor cells. The operational function refers to providing services through the Blood Service Network, monitored by the Ministry of Health, in order to strength availability and equitable access, avoiding trade in blood and components and exploitation of donors.[7]

In Mexico this aspect is regulated by the Official Mexican Standard NOM 253 SSA1-2012 for human blood disposition and its components for therapeutic purposes and for the transfusion process to follow these guidelines. The standard claims that: “Blood and blood components for therapeutic use must meet the necessary quality requirements in order to be safe or non-pathogenic, functional and, where appropriate, viable. To do so, donor assessment, blood draw, analysis, conservation, preparation, supply, transportation, reception, use and, where appropriate, final destination will be carried out meeting the guidelines established by this standard and other applicable provisions".[3]

Likewise, the aforementioned official norm also states the education aspect that should be given to people who may be eligible for donors and the factors that may imply a risk both for them and the recipient. Here begins the involvement of health personnel in the transfusion process. On the other hand, it is important to mention that as part of the essential requirement to perform or start all transfusion therapy, the informed consent form must be signed, as part of any procedure.

Transfusion therapy may be an intervention that saves lives or quickly improves a serious condition. However, like all treatments, it can lead to acute or late complications. Also, it

includes risks that can have serious or fatal consequences despite the strict controls preceding the transfusion. Nursing actions with patients who need transfusion support require a double effort to provide them with care since the transfusion act itself is a highly responsible process that demands extreme care, in addition to the interventions specific to their pathology.[8]

Nursing interventions are any treatment based on knowledge and clinical judgment, performed by a nursing professional to favor the expected result of the patient. Transfusion therapy is the therapeutic procedure consisting of administering blood or blood components to a human being. Therefore, the nursing intervention in transfusion therapy includes administering blood components and monitoring the patient's response.[8]

Oliveira et al., who conducted a study in Brazil, state that the transfusion process begins at the time of medical prescription and when requested. After confirmation, the pre-transfusion process starts when the doctor requests both transfusion and blood components. Then blood is drawn for crossmatching, a procedure that in most cases is conducted by the nursing staff. Vital signs and blood stock are also verified. If an error occurs when identifying the request form for blood components, then the whole transfusion process could be compromised.[9]

On the other hand, they point out that the personnel should be careful in the transfusion process when verifying data of the blood bag, confirming the hemotherapy for the correct patient, keeping the flow and avoiding hemolysis and paying attention to the puncture site. Care of the venous access, not mixing drugs with the infusion of blood components, monitoring vital signs and fever or alteration in vital signs, and normalize them if necessary, are also tasks to be performed by the nursing staff.
Based on the foregoing, it is important to note that there are areas of opportunity for therapy management. However, continuous and constant training is necessary for all the personnel involved in this therapy in order to improve the process and decrease the likelihood of errors during execution.
Vargas Bermúdez et al., who conducted a study in Costa Rica, state that nursing personnel should optimize their transfusion process training to benefit patient's safety and guarantee the quality of the process. They classified nursing care as follows: before transfusion, (administrative and assistance tasks), during the transfusion process, and at the end of the procedure. The latter will determine the higher quality of the process.[10]

Keeping records of procedures in the clinical file, which is essential for the process because all action must be documented, is among the aforementioned nursing care. In the case of nursing, annotations are generally made on the nursing sheet and filling in the data in the transfusion sheet provided by the blood bank, which represent legal support for the nursing staff as evidence of the process carried out. This transfusion control instrument (provided by the blood bank) must be required correctly, with complete data, vital signs record before, during and after the transfusion, start and end time, name and data of the professionals who verified and performed the procedure

All the aforementioned care belongs to the strict monitoring for all patients. Likewise, the nursing staff must be skilled enough to assess the procedure and be able to act in an emergency in order to guarantee safety of patients and give quality to the transfusion process. This care is inherent in nursing, so a correct procedure can reduce the risks endangering the life of a person. Orozco et al, in a study carried out in Mexico, point out that health personnel have at least 60 interactions during the transfusion process, meaning that each act taken may be a risk factor for mistakes that may impact the whole process. In their results they identified that the nursing staff does not record the data according to the norm and, therefore, the care that has been mentioned above is not fully provided. Thus, they suggest that the nursing staff should be trained in this area.[11]

Chaves Isidoro et al. reported another very important part in the activities of the nursing staff in the transfusion process, specifically when a patient goes to surgery. The staff must know when to request packages, the shelf life of blood samples, and the factors that influence the need for blood products, ensuring the availability of packages for surgery and contributing to safer surgical care.[12]

This Table (1) shows a summary of interventions performed by the nursing staff in Mexico to manage the transfusion therapy for adults.

The nursing staff has a fundamental role in transfusion therapy, from the moment in which they explain to the donor the risks and benefits, as part of an educational intervention, correct identification of the donor and recipient, as well as constant monitoring of vital signs before, during and after the transfusion. All of the above are part of all the interventions that the nursing staff performs, and that ensure the effectiveness of the entire transfusion process.

Conclusions

The nurse must be able to assess, make decisions and conduct interventions in case of any reaction in the patient during the transfusion therapy. Another important point that must be considered is that everything that the nursing staff does, specifically the transfusion process, must be recorded in the patient's clinical file and in the assessment, instrument provided by the blood bank, and mainly in the nursing sheet, those actions that support the execution of the procedure, as they provide a legal basis for nursing actions.

It is important to emphasize that constant training for the nursing staff to obtain theoretical knowledge and scientific bases to support their actions and guarantee the safety of patients and the quality of care in the process. All of the above is part of the interventions that the nursing staff performs during the different stages of the transfusion process.

International treaties, The Political Constitution of Mexico, official standards, the ministry of health and the national transfusion centers are part of the regulatory framework that regulate transfusion therapy in Mexico to guarantee a better quality of care and safety in and for the patient, not only in the process, but also in all those that concern nursing. If donating blood saves lives, we should increase its value by taking the responsibility for the implementation of a correct transfusion therapy.

Table 1. Nursing interventions for safe management of transfusion therapy in adults. Taken from: Guía de Práctica Clínica Intervenciones de Enfermería para la Seguridad en el Manejo de la Terapia Transfusional. México: Instituto Mexicano del Seguro Social; July 2, 2015.[8]

Blood Safety Measures		
Before	**During**	**After**
Patient and blood components identification.	Vital signs must be obtained and recorded.	Vital signs must be obtained and recorded.
Requests for transfusion confirmed.	Infusion time > 4 hours.	Timely registration
Blood transfusion clinical record must be known.	The regular initial drip rate of the infusion set is 30 drops per minute.	Monitor post-transfusion reactions.
Verify: - Informed consent for transfusion. - Blood compatibility and other choices - Bag integrity. - General physical characteristics - Controlled cooling.	Do not mix drugs.	Previously inactivated red medical waste disposal bag
Blood shall be transported in specified containers.	A 0.9% of salt solution can be used	
Stop for a break before identification	Patient is informed about signs and alarming signs	
Vital signs must be obtained and recorded.	Monitor puncture site	
A unique heavy-caliber access site		
Use a blood transfusion filter per unit		
Let thaw at room temperature.		
Strategies to avoid errors		
1. A risk management model must be used.	2. A culture of safety should be built.	3. Staff with relevant scientific knowledge and expertise.
4. Continuous training provided to staff.	5. Effective communication among health professionals.	6. Medical prescription must be confirmed in writing
Nursing interventions in case of a transfusion reaction		
1. The transfusion must be stopped immediately.	2. Intravenous route with 0.9% saline solution must be kept.	3. Vital signs monitored.
4. The physician must be notified.	5. Blood and urine sampling.	6. Prescribed medications must be administered.
7. The laboratory must be notified and the blood component delivered.	8. The transfusion reaction must be recorded in the corresponding format.	

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