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Transfusion reaction - Signs and symptoms and hemovigilance interventions

Reação transfusional – Sinais e sintomas e intervenções da hemovigilância

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ABSTRACT

The objective of this study was to raise in the literature on the transfusion reaction – signs and symptoms and hemovigilance interventions. This is a literature review. Scientific materials from the Latin American and Caribbean Health Sciences Literature (LILACS) and *Scientific Electronic Library Online* (Scielo) databases were used, and related articles on "Hemocompose Transfusion" were selected. Even in the face of the regulations and efforts of the National Health Surveillance Agency – ANVISA, together with the sentinel networks, the underreporting of events related to transfusion reactions is observed in the country. In this way, it is more difficult to control and recognize occurrences. Transfusion reactions cause damage of varying degrees to the patient and can be immediate: when the appearance of signs and symptoms happens during blood transfusion or up to 24 hours after the start of infusion therapy. As an integral part of the health system, all health professionals should achieve an optimal standard of patient care, prioritizing quality of care and good practices in the management of patients who need to be transfused.

Keywords: Transfusion reaction, Signs and symptom, Hemovilence.

INTRODUCTION

Blood is the organ that is most transfused in the world. Data show that about 14 million units of packed red blood cells (RBC) are transfused per year. This widely used procedure, especially during major surgeries, translates into expenses that represent approximately US$ 3 billion (average of US$ 225 per HC) [1]. Blood management has been defined as "the proper use of blood and blood components. Therefore, *Patient Blood Management* is a form of approach to transfusions based on knowledge that encompasses health professionals and has as its fundamental objective to reflect on blood transfusion, prioritizing the patient's needs. In this proposal, the use of allogeneic hemocompontences without a sufficiently adequate indication is reduced [1,2].

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Studies have complemented the idea of using less and less allogeneic blood in patients undergoing medical procedures. PBM is a program based on pillars that are described in the literature that emphasize this practice. These issues involve physicians because they depend directly on these professionals for the program to be effective. It is noteworthy in this reality that the protocol can minimize, in the face of the actions of prioritization of cases for transfusion, problems with blood infusions already known, restrictions on improper or indiscriminate use, since studies indicate that allogeneic blood transfusions can be related to unsatisfactory results that include, in addition to the severity of the patient, risks of mortality, in addition to different morbidities [2,3].

Some situations may recommend the use of the patient's own blood and not from donors, this fact has caused interest in being able to use this form of transfusion. Thus, the management of the patient's blood involves multidisciplinary and multimodal methods, in order to offer better responses to the patient in the choice of transfusion treatment [3].

Although blood transfusion is a therapeutic method accepted worldwide, it can carry both risks and benefits. Even when it is indicated judiciously. In order to avoid adverse reactions such as transfusion reactions, it is increasingly necessary to have control and observation over the blood cycle, which is the responsibility of hemovigilance [4].

Hemovigilance is a set of procedures that aim to obtain and provide information on adverse events that occur in its different stages, with the aim of preventing their appearance or recurrence and increasing the safety of the donor and recipient [4,5,6].

Brazil began discussions on hemovigilance in 2000. In 2001, the National Health Surveillance Agency (ANVISA) proposed the creation of the Brazilian Network of Sentinel Hospitals, which, among other purposes, would serve to aggregate the National Hemovigilance System (SNH), with the aim of promoting the health of the population and protecting it from the risks associated with the use of products and technologies that are developed at the service of health. including the control of blood and blood products [7,8,9].

The SNH is an evaluation system that warns about information derived from health products, including events related to the use of blood components, to prevent new cases or recurrences [9].

Thus, when the patient receives a bag of blood, he or she is subject to transfusion reactions. In Brazil, notifications of transfusion reactions were made spontaneously until 2010. From this date on, they became compulsory, due to the publication of RDC 57/2010, which

"*Determines the Sanitary Regulation for Services that develop activities related to the production cycle of human blood and transfusion components and procedures*" [10].

Even in the face of the regulations and efforts of ANVISA together with sentinel networks, it is observed in the country the underreporting of events about transfusion reactions, thus making it more difficult to control and recognize the occurrences. Transfusion reactions cause damage of varying degrees to the patient and can be immediate: when the appearance of signs and symptoms happens during blood transfusion or up to 24 hours after the start of infusion therapy. They can also be classified as late when they occur 24 hours after the beginning of the transfusion [9,10].

The most common signs and symptoms may be: chills, stiffness, fever, dyspnea, dizziness, urticaria, pruritus, among others. Early recognition by the health professional is important to minimize the consequences and harm to the patient [5].

In this sense, the question that will guide the study is: "In the face of the transfusion reaction, what are the signs and symptoms and the interventions related to hemovigilance?.

OBJECTIVE

To survey the literature on the transfusion reaction – signs and symptoms and hemovigilance interventions in this context.

METHOD

This is a literature review, using scientific materials from the databases - Latin American and Caribbean Health Sciences Literature - Lilacs, and *Scientific Electronic Library Online* - Scielo, selected related articles on "Hemocomponenrtes transfusion". The searches were carried out between August and November 2023, in publications available between 2010 and 2023. The keywords used for the search were: *Transfusion Reaction; Signs and Symptoms; hemovilence*.

RESULTS AND DISCUSSION

To prevent the damage that may result from a blood transfusion, it is necessary to ensure that the professionals who monitor this procedure (blood bank/nursing) record all the details about it11,12. Only from the data obtained is it possible for the blood bank to intervene and understand what happened in the face of the transfusion reaction event. It is of great importance that institutions plan and have a risk management policy, such as, for example, protocols consolidated in the organization, which contribute to safety and benefit the stakeholders: the

patient, the employee, and the institution [13]. Chart 1 below shows the attributions of the nursing professional of the Transfusion Agency Service.

·Chart 1 - Duties of the Transfusion Agency Service nursing professional - São Paulo - 2023

• Active identification and/or passive identification of the patient;
• Verification and checking of patient data in the Blood Transfusion Request – STS, blood component bag, immuno-hematological test results, sticker label and medical prescription;
• Pre-transfusion measurement of vital signs and recording on the specific form;
• Preparation and installation of the transfusion;
• Initial control of infusion speed (drip);
• Remain with the patient for the first 10 (ten) minutes after the start of the transfusion;
• Measurement of vital signs 10 (ten) minutes after the start of the transfusion and recording on the specific form.
• Communication to the nursing care professional to monitor the patient during the transfusion with a record of the communication made.

Source: Adapted from the Manual of Conducts in Transfusion Reactions [14] – EBSERH – 2020

Verification and verification of all patient data in the hemotherapy process can prevent patient switching, bag identification swapping, test results and records swapping, and blood component swapping at the time of transfusion. The risks are great and professionals must be trained and qualified for the procedure. Chart (2) below shows the attributions of the nursing professional who is in the care of the patient who will receive the blood14.

·Chart 2 - Duties of health care professionals - São Paulo - 2023

• Transfusion monitoring (drip control and maximum infusion time recommended for each type of blood component)
• Monitoring the patient during the transfusion (changes, signs, symptoms, complaints)
• Measurement of vital signs at the end of the transfusion and recording on the specific form

Source: Adapted from the Manual of Conducts in Transfusion Reactions [14] – EBSERH – 2020

Physicians, nursing professionals and health professionals who are directly related to transfusion therapy in care and/or in Hemotherapy Services need to be prepared to suspect or identify any chance of adverse events, all of which play an important role in this context. Nursing professionals play a fundamental role in transfusion procedures because they are directly involved with patient care (COFEN Resolution No. 511/2016), being the first professional to identify an adverse event and initiate the first conducts [14].

Transfusion reactions can be: acute reactions when patients may present even when receiving compatible blood. In these cases, there is a triggering of allergic reactions that are considered acute because they occur in the 1st 24 hours after the transfusion. This type of reaction occurs because the donor's blood contains specific plasma proteins that the recipient can recognize as unknown substances or allergens. In delayed hemolytic reactions (RHT) it can

happen between 24 hours and up to three weeks after transfusion. Hemolysis of transfused red blood cells usually occurs. This may be due to the process of pre-transfusion tests, which do not detect the presence of antibodies. Many people die as a result of this type of reaction. ABO antigen mismatch is the most common cause of acute hemolytic transfusion reaction. Antibodies against non-ABO blood group antigens can also cause HAST. This fact is also detected by the error or absence of identification (label) in the pre-transfusion sample of the recipient at the time of collection and the technical failure in cross-referencing the sample of the recipient in question with the blood component immediately before transfusion. Chart 3 below shows the most common symptoms in acute and late reactions [15,16].

Chart 3 - Signs of acute and delayed reaction with immunocomponents - São Paulo - 2023

• Jaundice
• Fever
• Skin irritation
• Pruritus
• Urticaria
• Drop in hemoglobin
• Water overload
• Lung injuries
• Destruction of red blood cells due to incompatibility between donor and recipient blood types
• Graft-versus-host disease (in which the transfused cells attack the cells of the person receiving the transfusion)
• Infections and complications of massive blood transfusion (poor blood clotting, low body temperature and reduced calcium and potassium levels)

Source: Holcomb JB, Tilley BC, Baraniuk S, et al [17], 2015

Hemovigilance should act consciously and directly in the face of the possibility of a transfusion reaction. Follow-up of hemovigilance is of fundamental importance. This service has the function of detecting reactions, which can be common, severe or rare, and initiating the appropriate treatments, which include the actions included in chart 4 below.

When 4 - Hemovigilance actions in the event of Transfusion Reaction - São Paulo - 2023

• Stop the transfusion immediately
• Check whether the blood component was correctly administered to the intended patient
• Provide another venous access and maintain serum
• Request immediate medical evaluation for diagnosis
• Report the occurrence to the Transfusion Agency Service
• nitiate clinical support and administer prescribed medication
• Provide a stop car in case of worsening of the clinical condition and speed up the transfer of the patient to the ICU
• Calm the patient

Source: Holcomb JB, Tilley BC, Baraniuk S, et al [17], 2015

It is important that there are direct and quick actions in relation to the patient. All patients should be transfused in units where they can be observed continuously and that this site has well-trained teams to carry out good practices and patient management. Patients should be asked to report symptoms that develop within 24 hours of completion of the transfusion. If a patient is receiving a transfusion to treat a hemorrhage, they may develop hypotension. In this context, there should be a clinical risk assessment and this should be careful and necessary. If the blood component is considered the most likely cause of hypotension, this procedure should be immediately interrupted or replaced by an alternative component and appropriate management and investigation should be initiated judiciously and quickly to find out early what happened during the transfusion [18].

Thus, studies prove that the more the patient has prior knowledge about his or her history of previous transfusions, the more valuable and extremely useful data collected from the patient is. Patients who have a history of reactions with erythrocyte antigens and antibodies are at significant risk of an increased transfusion reaction. For the cases mentioned, professionals should pay extra attention to the patient who will undergo blood transfusion and thus be attentive if the patient presents any report of malaise during or after the blood transfusion, minimizing serious events and situations that the patient may develop [19].

FINAL THOUGHTS

The concepts presented by the authors refer to the concrete pillars of hemovigilance and its collaboration for the quality of health care. What studies on hemovigilance highlight is that the hemotherapy service must be effective and meet the needs of patients. Thus, it is extremely important that the service offered to the patient by all health professionals is respectful and responsibly.

The use of blood components is intended to offer the patient a good therapeutic response. However, there are risks and the recipient may manifest signs and symptoms that should be avoided early, such as: fever, chills, hypotension or hypertension, dyspnea, among others. In this context, it is considered that the ability and continuous training of professionals who are directly in patient care should be a constant for the exercise of activities related to hemotherapy procedures. It is considered that, as an integral part of the health system, all health professionals should achieve an optimal standard of patient care, prioritizing quality of care and good practices in the management of patients who need to be transfused.

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