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PATIENT SAFETY IN TRANSFUSION PROCESS: INTEGRATIVE REVIEW

SEGURANÇA DO PACIENTE NO ATO TRANSFUSIONAL: REVISÃO INTEGRATIVA

SEGURIDAD DEL PACIENTE EN TRANSFUSIÓN: REVISIÓN INTEGRATIVA

Christiani Andrea Marquesini Rambo[1], Bruna Xavier Morais[2], Daniela Buriol[3], Vivian De Franceschi Brondani[4], Tânia Solange Bosi de Souza Magnago[5]

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ABSTRACT

Objective: to identify the care for patient safety during the transfusion. **Methods:** integrative literature review, carried out in April 2020, in the LILACS, BDENF, Scielo, Pubmed and Scopus databases. **Results:** the care were rated in three stages: pre-transfusion, transfusion and post-transfusion. In the pre-transfusion stage, it was identified care related to the correct identification of the patient; receiver's orientation about the procedure; assessment of venous access; checking of vital signs; and, use of the intravenous administration set for blood components. In the transfusion stage, it was highlighted care to monitor the recipient; identification of signs and symptoms of transfusion reaction; and control of the maximum infusion time. In the posttransfusion stage, it was evidenced the checking vital signs and recording the procedure in the patient's medical record. **Conclusion:** it became evident that identify care in the transfusion act is fundamental to promote safe practices in this process, with a view to eliminating preventable failures.

Descriptors: Patient safety; Blood transfusion; Blood safety; Blood; Nursing.

[1] RN, Administrative Technician at the University Hospital of Santa Maria (HUSM). Master's student of the Graduate Program in Nursing (PPGEnf) at the Federal University of Santa Maria (UFSM). Santa Maria, RS, Brazil. Federal University of Santa Maria.https://orcid.org/0000-0001-6428-9657

[2] RN, Master in Nursing by PPGEnf – UFSM. PhD student at PPGEnf – UFSM. Santa Maria, RS, Brazil. Federal University of Santa Maria.https://orcid.org/0000-0002-0446-9231

[3] RN at the CHC - UFPR /EBSERH. Master's student at PPGEnf – UFSM. Santa Maria, RS, Brazil. Federal University of Santa Maria.https://orcid.org/0000-0003-2635-5275

[4] RN, Master's student at PPGEnf – UFSM. Santa Maria, RS, Brazil.https://orcid.org/0000-0002-4179-0630

[5] RN, Associate Professor at the Department of Nursing at UFSM. PhD in Nursing from the Anna Nery School of Nursing – Federal University of Rio de Janeiro (UFRJ). Santa Maria, RS, Brazil.https://orcid.org/0000-0002-5308-1604

RESUMO

Objetivo: identificar os cuidados para segurança do paciente no ato transfusional. **Método:** revisão integrativa da literatura, realizada em abril de 2020, nas fontes de dados LILACS, BDENF, Scielo, Pubmed e Scopus. **Resultados:** os cuidados foram categorizados em três etapas: pré-transfusão, transfusão e pós-transfusão. Na etapa pré-transfusional, identificou-se os cuidados relacionados a correta identificação do paciente; orientação do receptor quanto ao procedimento; avaliação do acesso venoso; verificação dos sinais vitais; e, utilização de equipo próprio para hemocomponentes. Na etapa da transfusão, destacaram-se os cuidados para monitoramento do receptor; identificação de sinais e sintomas de reações transfusionais; e, controle do tempo máximo de infusão. Na etapa pós-transfusão, evidencia-se a verificação de sinais vitais e o registro do procedimento no prontuário do paciente. **Conclusão:** evidenciou-se que identificar os cuidados no ato transfusional é fundamental para promoção de práticas seguras nesse processo, com vistas à eliminação de falhas evitáveis.
Descritores: Segurança do Paciente; Transfusão sanguínea; Segurança transfusional; Sangue; Enfermagem.

RESUMEN

Objetivo: identificar los cuidados para la seguridad del paciente durante la transfusion. **Metodo:** revisión integrativa de la literatura, realizada en abril de 2020, en las bases de datos LILACS, BDENF, Scielo, Pubmed y Scopus. **Resultados:** los cuidados se categorizó en tres etapas: pretransfusión, transfusión y postransfusión. En la etapa pretransfusion, se identificó los cuidados relacionados con la correcta identificación del paciente; orientación del receptor con respecto al procedimiento; evaluación del acceso venoso; verificación de los signos vitales; y uso de equipos para componentes sanguíneos. En la etapa de transfusion, se tuvo cuidado de monitorear al receptor, identificación de signos y síntomas de reacciones transfusionales y controlar el tiempo máximo de infusión. En la etapa postransfusión, se evidencia la verificación de los signos vitales y el registro del procedimiento en la historia clínica del paciente. **Conclusión:** Se hizo evidente que identificar el cuidado en el acto transfusional es fundamental para promover prácticas seguras en este proceso, con miras a eliminar fallas evitables.
Descriptores: Seguridad del Paciente; Transfusión sanguínea; Seguridad de la sangre; Sangre; Enfermería.

INTRODUCTION

The transfusion of blood components is one of the most commonly performed procedures in hospitals. In Brazil, approximately 2.8 million blood components are transfused per year.[1] It is considered an essential health therapy for the treatment of numerous acute clinical conditions such as surgical procedures and serious accidents, and chronic conditions such as hematological and oncological diseases and transplants.[2] Therefore, the transfusion of blood components is extremely important in care, as it is a measure that saves the lives of many hospitalized patients.

However, although the transfusion of blood components is permeated with benefits to the receiver, it can present great associated risks. Failures that occur during

the blood cycle may be due to the production of the blood component, indication or inappropriate use of blood components; as well as, inherent to the receiver itself.[3]

The transfusion act is one of the stages of the blood cycle that begins with the medical decision to transfuse the patient, after obtaining the blood product.[4] Encompassing all procedures before, during and after the installation of the blood component. It is considered a multidisciplinary and medically responsible procedure, in which each category responds individually for their actions.[4]

Because it involves multiple steps, and different professional categories, such as physicians, nurses, nursing and laboratory technicians, this treatment demands strict risk control.[2] Adverse reactions resulting from blood transfusion occur mainly due to errors and transfusion reactions due to related factors to receptor response mechanisms. A study pointed out that 98% of serious adverse reactions in the transfusion process are caused by human failures.[5]

Acute hemolytic reaction, one of the main causes of mortality in blood transfusion, is caused by the administration of blood with ABO incompatibility.[6] Therefore, a failure, however small, that occurs at any stage of the transfusion process can have consequences disastrous.[2] The most common failures, which can lead to preventable serious adverse events, are: incorrect identification of the patient, blood samples or blood component bags; sample labeling mistake; laboratory failures; improper storage and handling of blood; omission of the final check at the bedside before installation and lack of monitoring of the patient during the transfusion.[3] Therefore, by identifying the precautions that can prevent such failures, there is the possibility of providing more safety to the procedure.

The clinical practice of transfusion is extremely complex, many care procedures are regulated through policies, norms and guidelines. However, the occurrence of failures, still present in transfusion practice, denotes a certain lack of knowledge or lack of compliance with these. Furthermore, the procedure involves a dynamic situation, in which several other factors can contribute to the occurrence of incidents.[7] There is the possibility of preventing them by strengthening systems, training teams and standardizing procedures throughout the process transfusion.[8]

To make this possible, it is essential to be aware of all the precautions or processes that make up the transfusion act. In this context, scientific evidence provides accurate data with a view to guiding health professionals in the execution of all stages of this process. Therefore, this study aims to identify care for patient safety in the

transfusion act. The acquired knowledge will enable consistent instructions on how care should be taken during this therapy, greatly contributing to transfusion safety.

METHOD

This study consists of an integrative literature review. Research method that allows the synthesis of multiple published studies and enables general conclusions about a particular area of study. It is considered an important tool that provides subsidies for the improvement of health care based on research results.[9]

The implementation of the study followed the six steps recommended for this type of review: elaboration of the review question; search for primary studies in data sources; data extraction; critical evaluation of included studies; interpretation of results and presentation of knowledge review/synthesis.[9-10]

In view of this, the review question was initially formulated from the acronym PICo, in which care was considered as P (problem), I (interest) patient safety and Co (context) the transfusion act. Thus, the following question was defined: "Which precautions are listed as essential for patient safety during the transfusion act?".

Then, the search for studies was carried out. This was carried out in April 2020, from the data sources: Latin American and Caribbean Literature in Health Sciences (LILACS) and Nursing Database (BDENF); Scientific Electronic Library Online (Scielo); National Library of Medicine/National Institutes of Health (PubMed) and SciVerse Scopus (SCOPUS). Access to the databases occurred through the journal portal of the Coordination for the Improvement of Higher Education Personnel (CAPES), through the Proxy system, of a public higher education institution in southern Brazil.

Inclusion criteria were: primary articles that answered the review question, in Portuguese, English or Spanish, published from 2004 onwards. The established time frame was based on the launch of the World Alliance for Patient Safety, from from which actions in favor of safety in health care were intensified.[11] Animal studies related to the indication of blood components and serological screening tests were excluded. It is noteworthy that duplicated studies in the databases were computed only once.

For the development of search strategies, we used keywords and controlled descriptors consulted in Health Sciences Descriptors (DeCs) and Medical Subject Headings (MeSH). Different crossings were carried out, using the Boolean operators AND and OR in order to expand the universe of publications. In the data sources in which the search retrieved a large number of productions, the Boolean NOT operator was used, aiming to limit the search to the theme in question. Language and year of

publication filters were applied, according to the inclusion criteria. Chart 1 lists the strategies used by data source.

Table 1. Control of strategies by data source. Santa Maria, RS, Brazil, 2020.

DATA BASE	STRATEGIES	TOTAL RECOVERED
Lilacs	*tw:(sangue AND transfusão AND (cuidado OR "procedimentos clínicos")) AND (db:("LILACS") AND la:("pt" OR "es" OR "en")) AND (year_cluster: [2004 TO 2020])*	**41**
BDEnf	*tw:(sangue AND transfusão AND (cuidado OR "procedimentos clínicos")) AND (db:("BDENF") AND la:("pt" OR "en" OR "es")) AND (year_cluster: [2004 TO 2020])*	**22**
Scielo	*transfusão AND ("segurança do paciente" OR "segurança transfusional" OR hemovigilância) AND la: ("pt" OR "en" OR "es") AND year cluster: ("2018" OR "2009" OR "2014" OR "2017" OR "2004" OR "2016" OR "2007" OR "2008" OR "2010" OR "2019" OR "2020" OR "2005" OR "2006" OR 2011" OR "2012" OR "2013")*	**43**
Pubmed	*((((transfusion[Title/Abstract] OR "blood transfusion"[MeSH Terms]) OR ("blood transfusion"[MeSH Terms] OR "blood component transfusion"[MeSH Terms])) AND ((("patient safety"[All Fields] OR "blood safety"[All Fields]) OR hemovigilance[Title/Abstract]) AND "humans"[MeSH Terms])) NOT "blood donors"[MeSH Terms]) NOT "blood donors"[MeSH Terms] AND ("humans"[MeSH Terms] AND (English[lang] OR Portuguese[lang] OR Spanish[lang])) AND ("2004/01/01"[PDAT] : "2020/12/31"[PDAT])*	**1052**
Scopus	(*TITLE-ABS-KEY (transfusion) AND TITLE-ABS-KEY ("PATIENT SAFETY" OR "BLOOD SAFETY" OR hemovigilance) AND NOT TITLE ("BLOOD DONOR") AND NOT KEY ("blood donor")) AND (LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2012) OR LIMIT-TO (PUBYEAR, 2011) OR LIMIT-TO (PUBYEAR, 2010) OR LIMIT-TO (PUBYEAR, 2009) OR LIMIT-TO (PUBYEAR, 2008) OR LIMIT-TO (PUBYEAR, 2007) OR LIMIT-TO (PUBYEAR, 2006) OR LIMIT-TO (PUBYEAR, 2005) OR LIMIT-TO (PUBYEAR, 2004)) AND (EXCLUDE SUBJAREA, "AGRI") OR EXCLUDE (SUBJAREA, "VETE")) AND (LIMIT-TO (LANGUAGE, "English") OR LIMIT-TO (LANGUAGE, "Spanish") OR LIMIT-TO (LANGUAGE, "Portuguese"))*	**3947**

The search was performed by two reviewers independently. Differences were assessed by a third reviewer for consensus. Initially, 5105 publications were identified, which were exported from the data sources to the Mendeley reference manager. It was detected that 851 records were duplicated. From this, assessments of the title and abstract of the remaining 4254 studies were carried out, with the purpose of verifying their adequacy to the eligibility criteria. 94 studies resulted, which were thoroughly read in full. At this stage, 76 articles were discarded. Thus, the corpus of the study was composed of 18 scientific productions. Figure 1 represents the flowchart, based on the Prisma 12 model, with the details of the search and selection of articles.

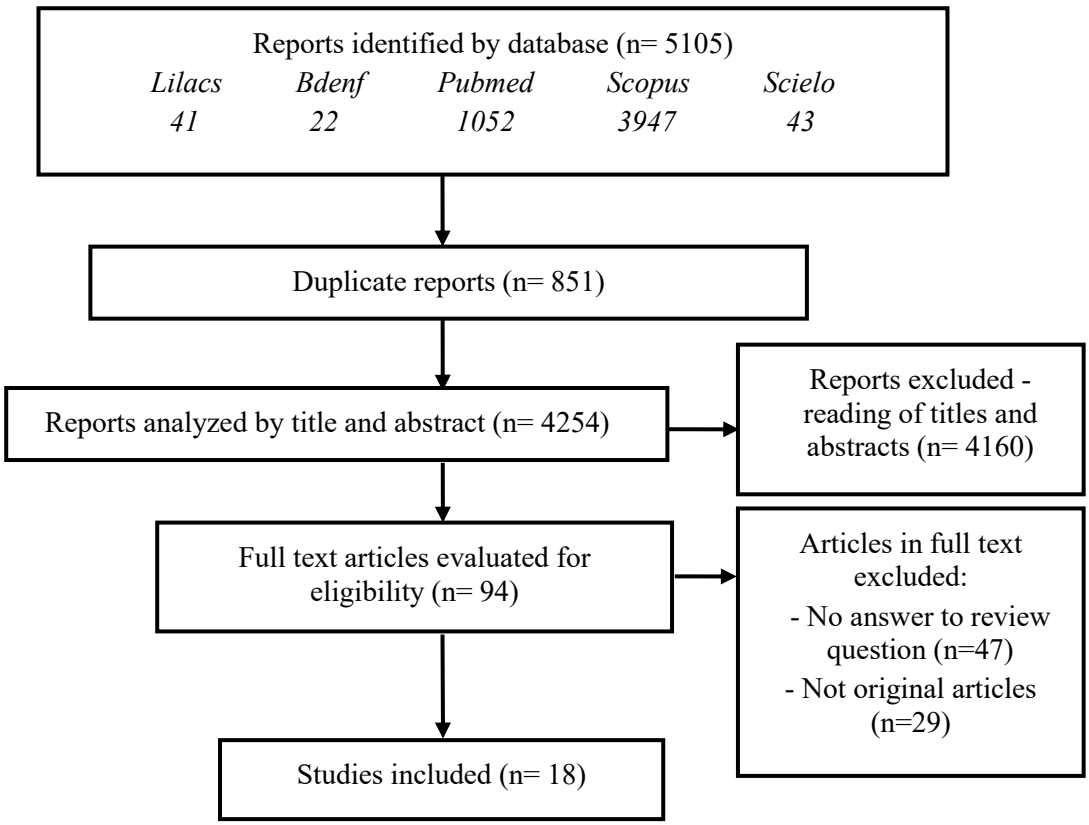

Figure 1 -Flowchart of selection of analysis units. Santa Maria, RS, Brazil, 2020.
Source: review data, 2020.

The selected articles were evaluated regarding the level of evidence, according to the classification system proposed by Melnyk; Fineout-Overholt[13], based on the type of study question (intervention, etiology or meaning). Key information was extracted from the articles, such as level of evidence, objective and study design, and organized in a synoptic table. These results are presented in a descriptive way. As for

the care identified in the studies, they were categorized by stage of the transfusion act (pre-transfusion, transfusion and post-transfusion). Regarding ethical considerations, as it is an integrative review, it was not submitted to an ethics committee; however, the copyright of the information synthesized in this manuscript was respected.

RESULTS

The corpus of this review consisted of 18 articles, which are shown in Table 2.

Table 2. Characteristics of the selected studies, regarding the objective, methodological design and level of evidence. Santa Maria, RS, Brazil, 2020.

No./ Ref.	Objective	Methodological design	NE*
A1[14]	Evaluate the adequacy of the activities of the NIC Administration of Blood Products intervention for adult patients, according to the opinion of clinical nurses.	methodological study *Data collection technique*: expert committee	N6[I]
A2[15]	To describe the construction process and content validation of a checklist for blood transfusion in children.	methodological study *Data collection technique*: expert committee	N6[I]
A3[16]	To analyze the transfusion monitoring record process in a public teaching hospital.	exploratory descriptive study *Data collection technique:*document analysis	N6[I]
A4[17]	To identify nurses' knowledge about nursing care in the post-transfusion process in the neonatal intensive care unit.	exploratory descriptive study *Data collection technique:*interview	N6[I]
A5[18]	To identify the knowledge of a nursing team about the transfusion process.	Cross-sectional study *Data collection technique:*quiz	N6[I]
A6[19]	Knowing the perception of nurses regarding nursing care in the transfusion process.	exploratory descriptive study *Data collection technique:*quiz	N4[III]
A7[8]	To describe the knowledge and application of institutional norms for the transfusion of blood components by nursing professionals.	Cross-sectional study *Data collection technique:*quiz	N6[I]
A8[20]	To analyze the knowledge of nurses in the neonatal ICU about the process of transfusion therapy.	exploratory descriptive study *Data collection technique:*interview	N6[I]
A9[21]	To verify the knowledge of the nursing team about hemotherapy, immediate transfusion reactions and care indicated in these cases, in an adult emergency unit.	descriptive study *Data collection technique:*quiz	N6[I]

A10[22]	To analyze nurses' knowledge about the transfusion process for newborn care in the neonatal intensive care unit.	exploratory descriptive study *Data collection technique:*interview	N6[I]
A11[23]	Develop, with nursing professionals, a monitoring instrument for patients undergoing blood transfusions.	qualitative study *Data collection technique*: focus group	N6[I]
A12[24]	Collectively build, with the nursing professionals of an intensive care unit, an instrument of good care practices during and after blood transfusion.	Assistive convergent research *Data collection technique:*group	N2[III]
A13[6]	Evaluate nurses' blood transfusion practice and provide background information to improve standards of care.	descriptive study *Data collection technique:*observation	N6[I]
A14[2]	Assess risks and identify preventive measures to reduce risks in blood transfusion.	descriptive study *Data collection technique:*group	N6[I]
A15[25]	Evaluate bedside clinical practice and promote best practices for blood administration.	descriptive study *Data collection technique:*observation	N6[I]
A16[26]	Analyze sample collection errors in the laboratory.	descriptive study *Data collection technique:*document analysis	N6[I]
A17[7]	Understand the pre-transfusion verification process from the perspective of those administering blood products.	Qualitative study - Multicenter *Data collection technique*: focus group and interview	N2[III]
A18[27]	To measure nurses' knowledge about blood transfusion.	descriptive study *Data collection technique*: quiz	N6[I]

Source: prepared by the authors based on data from the review, 2020.
Caption: Nº/Ref: Article number and reference; * Level of evidence based on Melnyk; Fineout-Overholt.13 -
I Classification of evidence from primary studies with a clinical question directed towards treatment/intervention.
II Classification of evidence from primary studies with clinical question directed towards prognosis or etiology.
III Classification of evidence from primary studies with clinical question driven by meaning

Among the selected articles, the year of publication ranged from 2010 to 2019, with a predominance in the years 2018 and 2016, with four studies each (22.2%). Considering the place where the study was developed, the majority (n=12; 66.7%) came from countries in the American continent, such as Brazil (n=11; 61.1%) and Costa Rica (n=1; 5,5%). Followed by the Asian continent (n=4, 22.2%), with research from China (n=1; 5.5%), India (n=1; 5.5%) and the United Arab Emirates (n=2; 11 ,1%). A study from the United Kingdom (n=1; 5.5%) and a multicenter study (n=1; 5.5%) carried

out in five countries (Canada, United Kingdom, Norway, Italy and the United States) were also included.

As for the methodological design, most studies were descriptive (n= 12; 66.7%), and the evidence classification that prevailed was level 6 (n= 15; 83.3%), with a clinical question directed to the treatment/intervention.[13] Three (16.7%) articles were classified in the pyramid with a clinical question directed towards the meaning[13], with two (11.1%) of them presenting level of evidence 2, considered stronger than the others, due to are qualitative studies.

Regarding the data collection technique, the predominant use of questionnaires (n=5; 27.7%) followed by focus group (n=4; 22.2%) and interview (n=3; 16.7%) . Care for patient safety in the transfusion process was listed and then categorized by stage of the transfusion act (pre, transfusion and post-transfusion), that is, before the installation of the blood component, during its infusion and after the end of the transfusion. The categorization with the respective care is represented in Table 3.

Table 3. Care for patient safety in the transfusion process, categorized by stage. Santa Maria, RS, Brazil, 2020.

Pre-transfusion
- Complete the requisition form containing: recipient data, type of blood component requested, quantity requested, reason for indication, special procedures, transfusion history of the recipient, transfusion modality, date of request, name, signature and CRM of the requesting physician[2, 8, 14, 18, 20, 26];
- Forward the request for blood components[20];
- Obtain the patient's transfusion history: previous transfusion, previous transfusion reaction, result of the irregular antibody test (IAP), identification of irregular antibodies, erythrocyte phenotyping[14,23];
- Obtain informed consent from the patient[8, 14-15, 18, 26];
- Check the religion of the receiver[8, 20];
- Guide the recipient or guardian about the procedure, informing risks, benefits, signs and symptoms of reaction[6, 8, 14, 18, 23-24, 27];
- Ensure that the patient is wearing an identification bracelet with correct and adequate data[7, 25-26];
- Collect a blood sample from the recipient for compatibility tests, labeling it at the time of collection with full name, medical record number, collection date, collector identification[2, 20, 26];
- Receive sample at the laboratory, matching request form[2, 7];
- Select and forward the correct product, to the correct patient, issuing bags to one patient at a time[7,26];
- Conduct and record results of compatibility tests[2];
- Select necessary materials[15, 18];
- Assess permeability of pre-existing venous access or obtain new access[6, 8, 14-15, 18-20, 22];
- Measure vital signs: temperature, heart rate, respiratory rate, blood pressure, before starting the transfusion[2, 6, 8, 14-15, 18-21, 24-25];
- Install the transfusion within a maximum of 30 minutes after removing the product from refrigeration[6, 16, 18, 27];
- Use disposable equipment, free of pyrogens, with a filter capable of retaining clots and aggregates[6, 14, 18, 20, 24, 27];
- Check the data on the blood component bag: full name of the recipient, ABO and RhD group of the recipient, name of the product, ABO and RhD group of the blood component, donor number, expiration date, completion of the compatibility test, date of performance of the evidence, name of the person responsible for performing the pre-transfusion tests and releasing the blood component[2, 8, 14-15, 18, 20, 24, 26];
- Compare the bag label with the label, the patient's medical record and the transfusion request[7, 18, 20];
- Observe the general appearance of the blood component: color, presence of lumps, integrity of the bag and validity[2, 8, 18];

- Perform positive identification of the recipient by comparing the data referred to the identification wristband and the bag data[2, 6-7, 15, 18, 20, 23-25, 27]; - Double check the data (bag and receiver) before installing the blood component[2, 8, 18, 23, 26]; - Assess the need for pre-transfusion drug administration[15, 23]; - Use personal protective equipment (PPE) and standard precautionary measures when handling the blood component bag[6, 14-15, 18, 24]; - Transport the blood component to the transfusion unit in a suitable container[2, 6];
Transfusion
- Install transfusion in exclusive venous access, avoiding administration of medications concomitantly with the blood component bag[14, 20, 23-24, 27]; - Install blood component in slow infusion, which may increase over time, maintaining flow monitoring[6, 14, 21-22, 24, 27]; - Accompany the receiver in the first ten minutes of the infusion[2, 6, 19, 22-24]; - Record in the patient's medical record: date and time of start of transfusion, product infused, volume, bag number, vital signs and professional responsible for installation and follow-up[15, 17-18, 23-24, 27]; - Strictly observe the maximum infusion time (4 hours), after this period, interrupt the transfusion and discard the bag[6, 14-16, 18, 22, 27]; - Check and record vital signs 10/15 minutes after installation and during transfusion[2, 6, 8, 16, 19, 21, 24-25]; - Monitor the patient, identifying signs and symptoms of transfusion reactions[14-15, 18,-19, 21-24]; - In case of suspected transfusion reaction: interrupt the transfusion, maintain permeable venous access with 0.9% saline solution; verify the identification of the blood component, checking if it was administered correctly; check vital signs; notify the attending physician; communicate the Hemotherapy Service; collect and send the recipient's sample together with the blood component bag and equipment to the Hemotherapy Service; collect and send blood and/or urine samples from the recipient to the laboratory when indicated by the physician[14, 17, 21-22, 24, 27];
Post-transfusion
- Salinize and maintain venous access[17]; - Check vital signs at the end of the transfusion[2, 8, 15, 17, 21, 24-25, 27]; - Register in the medical record: time of the end of the infusion, clinical status and vital signs of the recipient, intercurrences and adopted conducts[2, 8, 14, 17, 21, 23-24]; - Discard the blood component bag, after completing the infusion, in a hospital waste collector (infectious waste)[15, 17, 24]; - Monitor the patient for 24 hours after completion, assessing signs of transfusion reactions[15]; - Notify the adverse event in case of transfusion reaction.[22]

Source: prepared by the authors based on data from the review, 2020.

DISCUSSION

In this review, care was identified in the three stages of the transfusion act. The pre-transfusion stage is the one that involves more care, the most cited were related to the proper completion of the transfusion request form, the orientation of the receiver regarding the procedure, the evaluation of venous access, the verification of vital signs, the use of own equipment for blood components, the verification of data from the recipient and the blood component and the positive identification of the recipient.

The transfusional act begins with the medical indication. For this, a requisition/prescription form is required, which constitutes a legal document and justifies the need for the procedure. This needs to be filled out properly, following the rules.[2, 8, 14, 18, 20, 26] Studies have shown that most prescriptions for blood components lack minimum identification data.[2,28] Therefore, this is an aspect to be respected with rigour, bearing in mind that a failure in identification can compromise the security of the entire process.[20]

If necessary, an ethical-legal commitment with the recipient, regarding guidance on the procedure.[6, 8, 14, 18, 23-24, 27] The recipient has the right to be informed about the purpose, risks, benefits and adverse effects related to the therapy.[29] The information provides the participation of the patient, who, by reporting any abnormality during the procedure, will help to minimize possible harm. In addition, effective communication between the health team and the patient contributes to safety in care.

Another relevant care is the permeability of the venous access, and in the absence of one, obtaining it.[6, 8, 14-15, 18-20, 22] It is important that venous access is available before the blood component arrives at the unit. This care avoids delay in starting the transfusion and inhibits contamination of the blood component due to exposure time.[20] Evidence has shown that delays in starting transfusion and wastage of blood components could also be attributed to venous access problems.[6] In preoperative accesses, existing ones, the evaluation of infiltration and signs of infection is essential. In addition, the access must be sufficiently permeable in order to guarantee an adequate infusion flow, and exclusive for the transfusion[14, 20, 23-24, 27], in order to avoid incompatibility.

Careful monitoring of the recipient during transfusion is essential to detect possible transfusion reactions,since changing parameters can be the first symptom of a transfusion reaction.[29] In this sense, the articles highlighted the verification of vital signs before[2, 6, 8, 14-15, 18-21, 24-25], around 10 to 15 minutes after installing the blood component[2, 6, 8, 16, 19, 21, 24-25], and at the end of the transfusion.[2, 8, 15, 17,

[21, 24-25, 27] Prior assessment of vital signs plays an important role in monitoring, considering the possibility of comparison if there are changes during the infusion.[20] Periodic measurement aims to identify the adverse reactions and thus, take appropriate measures early.[24]

This evidence corroborates the current legislation that states that "the patient must have his vital signs (temperature, blood pressure and pulse) checked and recorded, at least, immediately before the beginning and after the end of the transfusion".[4:31] However, they differ as to the parameters to be evaluated, considering that the studies also add the verification of respiratory rate. In addition, regulations do not bring the mandatory control of vital signs after 10-15 minutes of infusion.

The selection of the appropriate equipment for the transfusion is also necessary.[6, 14, 18, 20, 24, 27] The health professional should be aware that the hemotherapy product requires a specific equipment, in order to avoid possible complications arising from the infusion of clots and/or aggregates into the bloodstream.[18, 24] The participants of a study did not indicate the use of this material, and it is possible to infer that they failed to comply with essential care for transfusion therapy.[20]

One of the most worrying problems related to blood transfusion is ABO incompatibility error.[20] Incompatible transfusions are avoidable errors, which commonly result from failures in bedside conferences.[5, 24] Therefore, the verification of the data of the hemocomponent bag [2, 8, 14-15, 18, 20, 24, 26], and the identification of the receiver[2, 6-7, 15, 18, 20, 23-25, 27], must be mandatory. These precautions can prevent the incorrect installation of a hemocomponent and consequently reactions caused by incompatibility.

Confirmation of the recipient's identity at the bedside, before the transfusion, is the most critical step in preventing transfusion errors, since it is the last opportunity to detect any errors made in the previous steps.[8] Adherence to checking the wristband identification, as well as positive patient identification, are recommended safety measures. Studies revealed that patients were at risk of receiving incorrect transfusions, with serious consequences, due to inadequate identification. The absence of identification bracelets and the lack of verification of all items related to the patient and the bag were the main flaws identified.[20, 25, 27]

Therefore, if any discrepancy is identified, the installation process must be stopped until the problem is clarified and resolved. If there are no discrepancies in the data, it is possible to proceed with the procedure. It is recommended that the infusion be started slowly[6, 14, 21-22, 24, 27], with

an increase in the flow during the course of the transfusion, in order to respect the maximum infusion time of 4 hours.[6, 14-16, 18, 22, 27] Slow infusion in the first minutes is justified by the fact that the most severe transfusion reactions occur at the beginning of the transfusion. This argument also clarifies the need for follow-up of the recipient in the first ten minutes of infusion.2, [6, 19, 22-24] This observation allows for rapid intervention in adverse reactions.[22, 24]

As for the infusion time, if it is exceeded, it may compromise the therapeutic properties of the blood product, due to exposure to uncontrolled temperature. This may also be a risk factor for bacterial growth.[23] Studies[6,27] have shown that more than 50% of nurses continued the transfusion even after exceeding the 4-hour infusion period. This finding goes against the recommendations to stop the infusion and discard the bag if the transfusion is not completed within the specified period.[4]

During the entire transfusion process the patient should be periodically observed in order to identify and intervene early in any adverse reactions.[14-15, 18-19, 21-24] Early detection is a strategy to minimize damage from transfusion. In this context, the importance of the nursing team's performance in relation to receiver monitoring is emphasized. Nursing professionals should have competence to recognize signs and symptoms of transfusion reactions and take appropriate measures to reverse the picture.[22] The interventions to be adopted cited in studies[14, 17, 21-22, 24, 27], are in line with current regulations[4], and has as a first step the immediate interruption of transfusion. One study found that the nursing staff of the institution studied had little knowledge of the signs and symptoms suggestive of transfusion reaction. This result was attributed to the lack of training offered to professionals.[21]

In the post-transfusion stage, one of the most relevant precautions was recording the procedure in the patient's medical record. The registration and documentation of the procedure is extremely relevant[2, 8, 14-15, 17-18, 21, 23-24, 27], considering that it provides an opportunity to verify whether the transfusion occurred in accordance with current regulations.[23] Due to this fact, studies have identified the inadequacy of the records, with the absence of essential data.[16-17] This lack of documentation of the entire process makes it difficult to trace failures. In addition, records are legal support for the quality of care provided and favor patient safety.

It appears that the transfusion practice is vital and extremely complex. The recipient of blood components is subject to risks arising from the quality of the blood product and failures during the execution of

the transfusion procedure.[30] Therefore, administration of blood components is an act of care that requires knowledge, practice of appropriate techniques, compliance with standards and procedures that ensure patient safety in this process.[29]

In this context, patient safety is a fundamental aspect of care provision and presupposes the continuous need for initiatives to improve quality.[25] Failures have a negative impact on the efficiency of the process and the result.[2] It appears that care practices are very diverse, which is why it is essential, especially in transfusion practice, to unify procedures, in order to offer care with less risk.[8] Therefore, it is essential that health professionals are aware of the care that guides the transfusion act and the implications for the patient when not respecting them.

CONCLUSION

The transfusion act is a complex process, in which safety depends on eliminating avoidable failures due to problems during care practice. Identifying the necessary care is essential in promoting best practices in the transfusion process and, consequently, patient safety.

It was found that the current norms corroborate most of the care rescued in scientific productions. However, laws are extensive documents, with little practicality for health professionals to handle. In view of this, it is believed that an instrument (checklist) that can compile all care based on scientific evidence would be fruitful, in order to favor the work of all professionals involved and promote patient safety.

As limitations of this review, the low level of evidence in most studies stands out, highlighting the need for more robust research on the subject. There was also little scientific production with regard to care for patient safety in immunohematology laboratories, during bag selection, carrying out compatibility tests and releasing the blood component.

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