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Identification and management of patients with immediate transfusion reactions in the perception of nursing students

Identificação e manejo de pacientes com reações transfusionais imediatas na percepção de estudantes de enfermagem

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ABSTRACT | OBJECTIVE: To know the perception of nursing students regarding the identification and management of patients with immediate transfusion reactions. **METHOD:** descriptive-exploratory with a qualitative approach, with the application of a semi-structured questionnaire in June 2022 to 15 nursing students at a private institution of higher education in southern Brazil. Data were analyzed according to content analysis, thematic modality. **RESULTS:** the category emerged: knowledge of nursing students regarding immediate transfusion reactions, consisting of two subcategories: conceptual weakness for early recognition of signs and symptoms of immediate transfusion reaction; and general and specific conducts in the event of an immediate transfusion reaction from the perspective of nursing students. Conceptual incipience was observed regarding the temporality of the transfusion reaction, and among the main signs and symptoms reported, pain and fever stood out. Although two participants did not know how to report any initial approach/conduct, it was observed that suspending the transfusion immediately, requesting a medical evaluation and checking vital signs were predominant in the statements. **CONCLUSION:** nursing students have a conceptual lack of knowledge about transfusion reactions, and recognize the most common and immediate changes indicative of transfusions, in order to list behaviors to be instituted by health professionals to minimize the impacts of these problems on patients.

KEYWORDS: Knowledge. Nursing students. Transfusion reaction. Patient care. Blood safety.

RESUMO | OBJETIVO: Conhecer a percepção de estudantes de enfermagem em relação à identificação e manejo de pacientes com reações transfusionais imediatas. **MÉTODO:** descritivo-exploratório de abordagem qualitativa, com aplicação de questionário semiestruturado no mês de junho de 2022 à 15 estudantes de enfermagem numa instituição privada de ensino superior do sul do Brasil. Os dados foram analisados segundo análise de conteúdo, modalidade temática. **RESULTADOS:** emergiu a categoria: conhecimento de estudantes de enfermagem em relação às reações transfusionais imediatas, constituída por duas subcategorias: fragilidade conceitual para o reconhecimento precoce de sinais e sintomas de reação transfusional imediata; e condutas gerais e específicas na ocorrência de reação transfusional imediata sob a ótica de estudantes de enfermagem. Observou-se incipiência conceitual quanto à temporalidade da reação transfusional, e entre os principais sinais e sintomas relatados destacaram-se a dor e a febre. Embora dois participantes não soubessem relatar nenhuma abordagem/condução inicial, observou-se que suspender a transfusão imediatamente, solicitar avaliação médica e verificar os sinais vitais foram preponderantes nos depoimentos. **CONCLUSÃO:** os estudantes de enfermagem apresentam desconhecimento conceitual sobre reações transfusionais, e reconhecem as alterações mais comuns e imediatas indicativas das transfusões, de modo a elencar condutas a serem instituídas pelos profissionais de saúde para minimizar os impactos desses agravos aos pacientes.

PALAVRAS-CHAVE: Conhecimento. Estudantes de enfermagem. Reação transfusional. Assistência ao paciente. Segurança do sangue.

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Introduction

Hemotherapy services continuously seek to offer safe blood transfusion. However, this practice has risks and complications at all stages that involve the blood cycle – from donor collection and selection to post-transfusion evaluation. These steps, if not properly managed, contribute to the occurrence of errors and serious and preventable adverse events.¹

Among the main errors related to the transfusion process, according to the National Center for Patient Safety, the following stand out: incorrect blood request or late order, incorrect identification or lack of identification of the patient and incorrect blood donation. Among the causes that led to the occurrence of these errors prevailed the lack of knowledge of the formal process, communication problems, with equipment and training.² Factors related to the recipient and/or donor, such as the existence of irregular antibodies not detected in routine pre-transfusion tests that corroborate the emergence of transfusion reactions (TRs).³

TRs are common adverse events in the administration of blood and blood products. They can be classified as immediate (up to 24 hours of transfusion) or late (after 24 hours of transfusion). Regarding the severity of the reaction can be classified from mild to severe, leading to death, and the pathophysiological mechanism are known as immune and non-immune.³⁻⁴ Approximately 0.5% to 3% of all transfusions result in TRs.⁵

In Brazil, a descriptive and retrospective investigation developed with information of 62,968 hemocomponents transfused from a hemotherapy unit in a university hospital in the northeastern region revealed the frequency of 6,43% of immediate TRs/1,000 transfused hemocomponents.⁶ Another longitudinal and retrospective study, whose objective was to analyze the immediate TRs occurred between 2007-2019 in a teaching hospital in the Southeast region showed that the average incidence was 4,4 TRs immediate /1,000 hemocomponents transfused.⁷

Due to the complexity of blood transfusion, training competent and trained professionals who have technical skills on the subject, especially nurses for being directly involved in pre-transfusion, peri-transfusion and post-transfusion care transfusion,

becomes an increasing demand to promote transfusion safety.^{1,8} The evaluation of the transfusion reaction by the health team is an integral part of quality management, where it provides corrective and preventive actions to minimize the severity and recurrence of this adverse event in a complex health service, such as the hemotherapy services.⁹

Considering the importance of nurses' performance in aspects related to the blood cycle, it is conjectured that unveiling the previous knowledge of nursing students regarding the recognition of immediate TRs and the initial conducts that need to be taken and managed, is relevant to identify weaknesses, promote improvements in the training process of the general nurse and ensure quality and safety in transfusion therapy in public and private health services in the country. Therefore, it was questioned: What is the perception of nursing students regarding the recognition of signs and symptoms and management of patients with immediate transfusion reactions?

Thus, the objective of this study is to know the perception of nursing students regarding the identification and management of patients with immediate transfusion reactions.

Method

This is a descriptive-exploratory qualitative research, conducted in a private University Center located in the southern region of Brazil. The target population was initially constituted by 54 nursing students enrolled in the last year of the undergraduate course, which was identified through the availability of a list containing the name and electronic contact (e-mail) by the coordination of the course.

The inclusion criteria adopted were being a student, aged 18 years or older, regularly enrolled in the undergraduate nursing course and attending the compulsory curricular internships of the fifth year of the respective curricular matrix of the course. All those who were away, on leave or who had some limitation to answer the questionnaire were excluded. After applying the inclusion and exclusion criteria, 15 nursing students accepted to participate in the research.

The approach to students took place in June 2022, and was carried out online, through an invitation made available by e-mail and through posts by the group of the class by the WhatsApp® application. To those who accepted to participate, an electronic form was made available by the Google Forms platform. In the opening of the form, it contained a link in which the participant would have access to the ICF (part A), and to access and continue in the completion (part B), he should select the option "I agree to participate voluntarily in the survey".

Part B consisted of the interview script containing questions for demographic characterization and the academic profile and a semi-structured questionnaire containing three questions, built based on the guide for the use of blood components⁽³⁾: (1) What do you mean by immediate transfusion reactions? (2) What are the signs and symptoms that indicate a probable immediate transfusion reaction? (3) What procedures should be taken after the occurrence of an immediate transfusion reaction?

After processing the participants' statements, thematic content analysis was used, subdivided into three fundamental stages: pre-analysis, material exploration and inferential interpretation.¹⁰ In this way, the transcribed data were "floating" and in-depth reading of the statements in order to identify different similar categories to form the documentary corpus of the research.

The discourses were categorized into a single category called "Knowledge of nursing students in relation to immediate transfusion reactions", containing two subcategories, namely: "Conceptual fragility and for the early recognition of signs and symptoms of immediate transfusion reaction" and "General and specific conducts in the occurrence of immediate transfusion reaction from the perspective of the nursing student".

To comply with Resolution 466/2012, the research was approved by the Ethics Committee of the Institute of Otorhinolaryngology of Paraná, under opinion number 5,425,320. To ensure anonymity, nursing students were identified with the letter S (Student) followed by the numeral for the delivery of the online questionnaire (S1, S2...S15).

Results

The participants were 15 nursing students, all female and aged between 22 and 46 years. Nine participants already worked in the health area, being five nursing techniques, two performing paid internship, a pharmacy assistant and an elderly caregiver.

According to the participants' statements, the following thematic category emerged:

Knowledge of nursing students in relation to immediate transfusion reactions

When nursing students were asked about training in blood transfusion and about the management of the patient with TRs in theoretical/ practical classes during the undergraduate course in nursing, ten interviewed reported that the content was addressed during the training process. It was observed that seven students do not feel prepared to detect and provide assistance to patients with TRs.

Based on the statements and the objective of this research, two subcategories emerged: "Conceptual fragility and for the early recognition of signs and symptoms of immediate transfusion reaction" and "General and specific conduct in the occurrence of immediate transfusion reaction from the perspective of the nursing student".

Conceptual fragility and for early recognition of signs and symptoms of immediate transfusion reaction

Nursing students reported, in general, incipient knowledge regarding the definition of immediate TRs. They exposed that they are incidents that occurred during or after blood transfusion and blood products; however, only three participants correctly specified the definition, considering the time between the transfusion and the onset of signs and symptoms suggestive of the disease. One student reported that the event may vary from mild to death, as can be seen from the reports below:

Immediate transfusion reactions are complications that occur during transfusion. (S2).

Some event that occurs during or after the transfusion. (S4).

Everything that may happen to the newly transfused patient. (S6).

Intercurrences that occur during or within 24 hours related to transfusion. (S7).

These are injuries that occur in the first 24 hours, ranging from mild to fatal. (S10).

These are reactions that can occur during the transfusion or up to 24 hours. (S15).

Blood incompatibility was identified by two students as a contributing factor for the occurrence of immediate TRs, as can be verified by the following statements:

Body reaction against transfusion, rejection. (S13).

Reaction to blood transfusion when there is a blood incompatibility. (S14).

Regarding the signs and symptoms of immediate TRs reported by the students, there was a predominance of pain, fever, cardiac, respiratory, digestive and tegumentary changes, according to the reports:

Pain, tremor, chills, hypotension, fever, glottis edema, dyspnea, among others. (S1).

Local pain and fever. (S2).

Change in temperature, pain, hypotension. (S4).

Fever, altered blood pressure, sweating, headache. (S5).

Fever, itching. (S6).

Pain at the site, vomiting, fever. (S7).

Sweating, change in blood pressure, tachycardia/ tachypnea. (S8).

Hypotension, pain, fever, hives. (S9).

High fever, redness in the body. (S13).

Infusion site pain, fever, severe tremor, severe hypotension, chest pain, abdominal and flank pain, dyspnea. (S15).

In general, students perceive the main signs and symptoms suggestive of immediate TRs. In addition, they cited several general and specific behaviors that should be adopted by the nursing team in the occurrence of this disease, as described in the subsequent subcategory.

Nursing conducts in the occurrence of immediate transfusion reaction

Concerning the management of patients with suspicion or diagnostic confirmation of immediate TRs, the deponents recognize that among the general conduct of the medical and nursing staff, are the interruption of the transfusion immediately and request for medical evaluation, assess vital signs, monitor the patient for possible complications and conduct investigation and notification of the incident to the competent bodies.

Immediately discontinue transfusion, maintain saline peripheral venous access, check vital signs, call physician. (S1).

Stop the transfusion immediately. (S3).

Stop, check vital signs, assess and classify the occurrence. (S7).

Call the doctor and stop the transfusion. (S9).

Immediately stop the blood component infusion and call the doctor. (S11).

Immediately stop the transfusion, notify the doctor and check for a worsening of the symptoms. (S14).

However, two students were not able to identify the initial care that needs to be performed to the patient with suspicion or confirmation of TRs, as evidenced by the reports:

I don't know. (S5).

I'm unable to answer. (S6).

Depending on the type of transfusion reaction, specific procedures can be established by the health team. In this context, two students reported collecting blood samples for immunohematological tests and sending the blood bag with the transfusion team to the institutional transfusion agency, as observed in the following statements:

Stop the transfusion and send the blood back to where it came from, indicating that there have been adverse reactions. (S12).

Maintain saline venous access, check vital signs, assess whether there is a possibility of a more aggravating reaction, collect blood samples for laboratory. (S15).

It is observed that the participants reported a series of care that needs to be adopted in cases of immediate TRs, whose purpose is to assist the patient properly, prevent potential complications and contribute to investigation and notification of the disease.

Discussion

Nursing students demonstrated incipient knowledge regarding the definition of immediate TRs, specifically regarding the temporality of the disease. This data corroborates the findings of a study conducted with 37 nursing students from the last year of graduation of a Brazilian public university in which approximately half of the students were unaware of the deadline of up to 24 hours as a criterion to classify the TRs as immediate.¹¹

The lack of knowledge about the period of onset of symptoms was also evidenced in an investigation carried out with nurses and nursing technicians of a university hospital in the Midwest region of Brazil, in which the majority answered incorrectly.¹² These findings show weaknesses in the knowledge of nursing students in the process of training, but also of the professional working in clinical practice on the subject.

In this way, it is imperative to deepen the teaching in relation to the classification period of immediate TRs, as future professionals in the area need to consider the 24-hour period to monitor and identify signs and symptoms that indicate a possible transfusion reaction; the reverse may contribute to inaccuracy of records and, successively, to underreporting of cases and not adopting measures aimed at promoting patient safety in subsequent transfusions.

Health professionals, especially nursing professionals, need to guide patients regarding the main changes that signal a possible acute reaction, favoring the report and making them co-participants in transfusion care and care safety.¹³ Among the signs and symptoms presented by patients, changes in vital signs, for example, hypotension and fever, as well as hives, hematuria and subjective symptoms, such as back pain and dizziness, stand out. All are considered critical and recognizing them in advance is important to conduct accurate hemovigilance.¹⁴

In the meantime, when verifying the results of this research, it was observed that most students reported pain and fever as prevalent changes, without specifying, for example, the criterion of elevation of 1°C in body temperature associated with blood transfusion. Three students (S2, S7, S15) specified the pain site (infusion site, chest, abdominal and lumbar pain), corroborating other changes that make up the clinical picture of patients with TRs.³

In this context, from the moment of the decision to transfer the patient by the medical professional, the relevance of identifying and intervening in the risks related to transfusion, including those directed to prevent serious reactions due to blood incompatibility, is recognized which was reported by two academics of this research. On the other hand, there are variations in clinical practice in relation to

actions promoting care security and in the evaluation of the general state of the patient and the records of vital signs before, during and after the transfusion process, which helps not to detect early immediate TRs and to adopt, in a timely manner, assertive interventions to avoid serious complications.¹⁵

It is essential that the undergraduate nursing student knows the importance of evaluating the general condition of the patient before installing the blood infusion. If you pay attention to the values obtained from vital signs and other physiological changes, such as changes in the color of the skin and urine, chills, nausea and pain, presented by the patient in the pre-transfusion stage, contribute to not confuse signs and symptoms existing with those that indicate possible incidents arising from blood infusion. The systematic and judicious evaluation by the health team becomes opportune to offer adequate, safe and effective care to the patient affected by immediate TRs, favoring the identification of changes with greater precision, in order to assist in the clinical and laboratory diagnosis and in the conducts that should be adopted by possible intercurrences of the transfusion act.

The safety and proper management of blood transfusion and blood products depends largely on the knowledge and skills of the health team, being these crucial elements to achieve desirable results and with minimal risk and adverse events associated with transfusion practice.¹

In cases of immediate TRs, it was noted that several general and specific actions were found in the statements of nursing students now researched. Among these, we highlight: it is recognized that interrupting the transfusion, communicating the attending physician and the hemotherapy service, maintaining venous access with 0.9% physiological solution, measuring vital signs, observing cardiorespiratory parameters, notify the occurrence and record the actions in the patient's medical record are general conducts that need to be managed and implemented after the suspicion and/or confirmation of TRs. When relevant, a post-transfusion sample should be collected and sent with the transfused blood component bag and the equipment to the hemotherapy service to investigate the case.^{3,16}

In France, a cross-sectional investigation conducted with 50 medical residents of a university hospital pointed out difficulties in the identification and management of TRs by these students. Although most reported suspending the transfusion as immediate conduct in the suspicion of a transfusion reaction, none stated the need to maintain venous access. About two thirds expressed the need for blood sample collection and notification of the disease, and less than half of the interviewees reported sending the hemocomponent bag to the laboratory to investigate the case.¹⁷

In this research, it is noteworthy that no academic referred to the need to conduct records of the occurrence of the reaction and the care performed in order to minimize its effects. It is evident that nursing is concerned with doing so, to the detriment of records of their assistance. In this sense, investments in training and training concerning the improvement of records in this category are pertinent, encompassing technical, ethical and legal issues of nursing notes/evolutions.¹⁸

The taking of notes and nursing records after the occurrence of TRs is important, because in addition to describing the care provided to the patient, allows to prove the execution of the nursing process, and it is an indispensable tool for proving care provision based on technical and scientific principles, aiming at continuity of care.¹⁹

Final considerations

Nursing students demonstrated incipient knowledge about the definition of immediate TRs, and although they reported several signs and symptoms suggestive of this disease, they was observed fragility regarding the specific criteria of pain location and body temperature rise. As for the initial conducts after the suspicion and/or confirmation of the disease, suspending the transfusion immediately, communicating the doctor and checking the vital signs were prevalent in the reports of the deponents.

The limitations of this research focus on the fact that the results are limited to the particularities of

data collection in a single educational institution and with a cross-sectional method, which prevents the generalization of the results.

There is a need for improvements in the training process of the generalist nursing professional in the contribution of improving the recognition and management of patients affected by transfusion reactions. In this way, the results found can contribute to improve and develop innovative actions/practices for training nursing students, to offer in their professional practice a quality and safe assistance in the hemotherapy context in health institutions.

Authors' contributions

Torres VLV and Batista J participated in the conception, design, search and analysis of the research data, interpretation of the results, elaboration of the discussion, conclusion and writing and final review of the scientific article.

Conflict of interests

No financial, legal or political conflict involving third parties (government, companies and private foundations, etc.) has been declared for any aspect of the submitted work (including but not limited to grants and funding, participation in advisory board, study design, manuscript preparation, statistical analysis, etc.).

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