



# IJS

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## Risks and benefits of blood transfusion in Brazil and worldwide

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**Abstract:** Transfusion is the medical act of transferring a blood or blood components (blood plasma, platelets, red blood cells and leukocytes from a donor to the circulatory system of a recipient. Transfusion is often used in surgical interventions, trauma, gastrointestinal bleeding or in other cases where there has been a large loss of blood. This study is based on a systematic review of the literature, using scientific articles with high scientific basis for a better understanding of the discussion. It was based on articles related to the proposed theme, where the following platforms were used for data collection; SciELO, Google Scholar, PubMed and DATASUS. Transfusion is defined as an intravenous therapy with whole blood or with blood components, depending on the availability and indication of transfusion. It is of paramount importance to know the care that guide blood transfusion and the possible complications that this therapeutic practice can bring to the patient. In this context, it can be concluded that blood transfusion is a technique that has become safer and more effective over time, due to new techniques created such as separation of blood components and serological testing so that there is a decrease in disease transmission.

**Keywords:** Hemotherapy; Blood transfusion; Blood donation

## 1. Introduction

Transfusion is the medical act of transferring a blood or blood components (blood plasma, platelets, red blood cells and leukocytes from a donor to the circulatory system of a recipient. For the success of the procedure, it is necessary to have a compatible between the agents. It is a type of therapy that has been shown to be very effective in situations of shock, bleeding or blood diseases.

Blood circulation was described by William Harvey in 1616, but the first transfusion occurred only in 1667 using sheep's blood for transfusion performed on a man, who died shortly after transfusion. Blood transfusion began to be performed arm by arm, where one person gave directly to another, being used in cases of severe bleeding. (PEREIRA *et al.*, 2010).

The safety of blood transfusions has increased significantly in recent years. Currently in Brazil, about 1.8% of the population is a blood donor (PEREIRA *et al.*, 2016), presenting a deficiency, because the WHO recommends that it be around 3 to 5% of the population. (FREITAS, 2016)

Transfusion is often used in surgical interventions, trauma, gastrointestinal bleeding or in other cases where there has been a large loss of blood. The first transfusion preceded by the performance of compatibility tests was performed in 1907 by Reuben Ottenber, but this procedure only began to be used on a large scale from the First World War (1914-1918).

In 1914, Hustin reported the use of sodium citrate and glucose as a diluent and anticoagulant solution for transfusions, and in 1915 Lewisohn determined the minimum amount required for anticoagulation. In this way, blood transfusions became safer and more practical. After four decades of the discovery of the ABO system, another fact revolutionized the practice of transfusion medicine, the identification of the Rh factor, performed by Landsteiner.

Several factors must be checked for blood transfusion to occur safely, such as donor uptake and the arrival of blood to the recipient, conducting immunological and hematological tests, safety standards, serological screening. (DE; SILVA, 2005).

Currently, blood transfusion is one of the five most performed procedures in the world and its prescription is made for 10% of all hospitalized patients. According to the Ministry of Health, around 3.5 million blood bags are collected annually in Brazil. Therefore, the biggest challenge is to increase the donation, because donors represent only 1.7% of the Brazilian population. (LUDWIG, 2005).

Today, blood transfusions are modernized and their methodologies more judicious. The common problems of the past in the issue of lack of knowledge in ABO systems, transfusion contaminations and blood conservation itself brought problems that are currently caused by the modernization of the process. The screening and separation of blood components today present themselves in Brazil with a very advanced technological level and this is counterbalanced

with the problem of demand: lack of blood donors. In addition to this difficulty, an epidemiological issue of diseases such as Zika and religious social conflicts interferes from blood collection to transfusion of due blood components.

## 2. Methodology

The present study is based on a systematic review of the literature, using scientific articles with high scientific basis for a better understanding of the discussion. It was based on articles related to the proposed theme, where the following platforms were used for data collection; SciELO, Google Scholar, PubMed and DATASUS. The inclusion criteria used were based on the descriptors chosen, they being; blood therapy, blood transfusion, blood donation. It is also used as a criterion works in Portuguese and English. Filtering was used as exclusion criteria within the period from 2010 to 2022.

The constant search for new strategies to reduce the need for transfusion of blood and derivatives has always been in focus in order to avoid transfusion-related complications such as: febrile reactions, Chagas disease, hepatitis, malaria, among others (ROCHA, 2016).

## 3. Results and Discussion

Transfusion is defined as an intravenous therapy with whole blood or with blood components, depending on the availability and indication of transfusion. Transfusion is responsible for complex alterations of the immune system, producing immuno-modulations, becoming a risk factor for hospital infection or recurrence of neoplasms (GOMES, 2006). The mechanism of immunomodulation after transfusion is not yet fully elucidated and is probably multifactorial. It is known that after blood transfusion there is a decrease in the function of natural killer cells and macrophages, inducing the suppression of T lymphocytes (PRITTIE, 2010).

It is the most used method when the patient exhibits great blood loss or some deficiency in the production of its elements that are essential for life, due to this, the pressurizes need for transfusion of blood and derivatives is inevitable in episodes of acute anemia and intraoperative bleeding.

It is also considered of above importance the use of ionizing radiation for sterilization of transfusion bags of blood components to slaughter the chances of any type of severe transfusion reaction, such as graft-versus-host disease, patients with severe immunodeficiencies and premature newborns, allowing greater safety in transfusions.

The transmission of microorganisms is rare, but it has adopted immense popularity in the media when acquired immunodeficiency syndrome (AIDS) was born in the mid-1980s and its potential risk of transmission is via blood. In addition, several microorganisms can be transmitted, such as hepatitis B and C viruses, Chagas disease, HIV 1 and 2 viruses, HTLV virus and *Treponema pallidum*, which is responsible for syphilis transmission.

Regarding blood receptors, the Ministry of Health determines the performance of pre-transfusion immunohematological tests such as ABO/Rh classification, irregular antibody research and compatibility test.

Sand dealing with transfusions, there is growing evidence that this may be a factor that contributes to the increased risk of morbidity and mortality. Thus, knowing widely the processes inherent to the transfusion process can contribute to the qualification of care and minimize risks and complications

Over time, health institutions have been adopting quality management with the use of efficient management models, which are used for both those who use and for health professionals. As an integral part of the health system, it understands that an optimal standard of patient care can only be achieved if it seeks quality care. It is of paramount importance to know the care that guide blood transfusion and the possible complications that this therapeutic practice can bring to the patient.

Blood donations cannot keep up with the consumption of blood transfusions, which causes a great difficulty for hemocenters, in meeting all emergency requests, causing life-threatening for the population. (SUELY; RODRIGUES, 2011)

Currently several researchers have been developing new therapies seeking to reduce the use of halogen blood, such alternatives can be divided into two groups: one that decreases the loss or increases the tolerance of blood loss such as the use of recombinant erythropoietin, fibrin sealants and cell-free oxygen carriers. And the reinfusion of the patient's own blood as normovolemics hemodilution, preoperative donation of autologous blood for reinfusion, intraoperative recovery of blood and postoperative recovery of blood. (ORANGE TREE *et al.*, 2012)

#### 4. Conclusions

In this context, it can be concluded that blood transfusion is a technique that has become safer and more effective over time, due to new techniques created such as separation of blood components and serological testing so that there is a decrease in the transmission of diseases. In addition, the present study evidences the impairment of transfusion safety at specific moments of the procedure. It is notepoint that, although professionals have the appropriate knowledge, there are still several neglects related to some procedures considered fundamental to ensure transfusion safety.

#### References

- [1] BEZERRA, Carolina Martins *et al.* Construction and validation of checklist for blood transfusion in children. *Revista Brasileira de Enfermagem*, v. 71, p. 3020-3026, 2018. Access at sea, 29.
- [2] CONCEPTION, Mário José da. Blood transfusion in children and methods to avoid it: a reassessment. *Revista Brasileira de Anesthesiology*, v. 54, n. 2, p. 276-282, 2004. Access at sea, 28.
- [3] FAQUETTI, Maritza Margareth *et al.* Perception of blood receptors regarding the transfusion process. *Revista Brasileira de Enfermagem*, v. 67, p. 936-941, 2014. Access at sea, 28.
- [4] HOFFBRAND, P.A.H. MOSS, J.E. PETTIT. *Fundamentals in Hematology*. 5th ed. Rio de Janeiro, Artmed, 2006. Access at sea, 30.
- [5] MATTIA, Daiana de; ANDRADE, Selma Regina de. Nursing care in blood transfusion: an instrument for patient monitoring. *Text & Context-Nursing*, v. 25, 2016. Access apr, 01.
- [6] PINHEIRO, C. A. *et al.* EVALUATION OF THE BLOOD TRANSFUSION PROCESS IN A PUBLIC INSTITUTION. *Hematology, Transfusion and Cell Therapy*, v. 43, p. S361-S362, 2021. Access apr, 01.
- [7] SOUZA, Gabriela Fátima de *et al.* good nursing practices in the intensive care unit: care during and after blood transfusion. *Revista Mineira de Enfermagem*, v. 18, n. 4, p. 939-954, 2014. Access at sea, 28.
- [8] SILVA JUNIOR, João Manoel *et al.* Intraoperative blood transfusion, complications and prognosis. *Revista Brasileira de Anesthesiology*, v. 58, p. 447-461, 2008. Access at sea, 20.
- [9] VERRASTRO, THEREZINHA. *Hematology and Hemotherapy: Fundamentals of Morphology, Physiology, Pathology and Clinic*. 1st ed. São Paulo: Atheneu, 2006. Access at sea, 30.
- [10] Vieira, Marcelo da Silva. Genetic and immunophysiological approach of The ABO and HR systems for better understanding and teaching of fetal erythroblastosis. Belo Horizonte, 2013. FOR BLOOD. Pr. Dr. Vicente Odone Filho. Available in <[www.prosangue.sp.gov.br/home/Default.aspx](http://www.prosangue.sp.gov.br/home/Default.aspx)>. Access at sea, 28.
- [11] VALETE, Cristina Ortiz; BARBOSA, Aduino Dutra. Update on blood transfusion and anemia of the premature infant. *Pediatrics (São Paulo)*, p. 37-42, 2010. Access at sea, 28.