

# Transfusion of Blood Components in the Newborn Service of the Hospital

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## ABSTRACT

**Objective:** Determine the profile epidemiology of patients who deserve these of blood products, and correlate them with international management standards.

**Material and Methods:** Prospective, observational study, cross-sectional and descriptive in the Newborn Service Born from Hospital, in July 2019 to July 2020 in patients who they needed transfusion of some blood product.

**Results:** 177 patients were included from which 91 were male, 85 sex female and 1 sexual ambiguity. They needed more transfusions term newborns with low birth weight, compliance with transfusion was given in only 57% of patient cases, the most administered component being the globular concentrate, the average number of donors per patient was 1.6. The incidence of transfusion found was 12.6 / 1000. **Conclusion:** The patients who required more donor transfusions per patient were small term newborns for gestational age, within them the delay of intrauterine growth associated with sepsis neonatal. The study found that 62% of the patients had growth retardation intrauterine. The need for transfusion was related in 95% of cases to infections, which were responsible for the transfusion of blood products. To fulfill the 100% of the transfusion indications are they needed 3 donors per patient.

**KEYWORDS:** Transfusion, Blood Products, Newborns, stunted growth intrauterine, sepsis, donor.

## INTRODUCTION

Transfusion therapy is a science in constant renewal; at the beginning of the 20th century recommended transfusion of the component blood cells individually, limited to use of whole blood [1]. It was in the decade of the 60's, with the development of plastic material for bags and transfusion sets, which are facilitated the routine practice of separating blood components, which allowed a use more rational according to clinical needs of the patient, this in line with the postulate that establishes the objective of transfusion which is to replace the product blood deficit from the point of view quantitative or qualitative of the patient, this in line with the postulate that establishes the objective of transfusion which is to replace the product blood deficit from the point of view quantitative or qualitative [1]. The indication for transfusion in patients anemic, laboratory assistance and clinical assessment play an essential role. Currently, transfusion practices in neonates continue to generate controversy,

without There is a consensus [2], varying the indications in each country, guiding itself on more occasions, in logical assumptions that in scientific information extracted from controlled clinical trials [3]. There are no firm indications for transfusion of blood components, being essential consider the underlying pathophysiology, goal treatment and all aspects of risk benefit when making the decision to transfuse [3]. When these transfusions are unavoidable, should limit the number from donors involved [4], data from the decade from the 80's indicate that 80% of newborns with very low weight at born received multiple transfusions, many of them coming from donors separated, the trend therapy current is to decrease the number of transfusions throughout use of therapies alternatives as the Erythropoietin [5]. The indication for transfusion of blood products has evolved with the creation of protocols specific to decrease the indication excessive [6], thus example Kumar et al reported that in one evaluation of the use of blood components like platelets, only 25% of patients had previous information on the count platelet, 35% received treatment unnecessary prophylaxis and in 89% of procedures were performed with doses platelets [7], a situation that has brought with it the creation of hospital committees transfusion, with policies and criteria of according to each context, becoming structures essential in the surveillance of internal compliance of the different protocols [8;9]. Recent advances in the donor monitoring, blood tests prior to transfusion and changes in the collection of components, have allowed that transfusion is another procedure safe [10]. The decision to transfuse should not only be based on laboratory findings but also in the presence or absence of symptoms, the ability functional of the child, the etiology of the disease, the possibility of using alternative treatments and the presence or absence of clinical conditions additional [11], emphasizing the literature on the need for constant interaction and coordination between clinicians and center transfusion or blood banks and audits continuous medical procedures that allow optimal use of blood components [9]. Currently there are that report the type of patient that requires transfusions in the population pediatric, much less in newborns, is therefore the purpose of this study is describe the epidemiological profile of patients with transfusion therapy admitted to the Newborn Service of Hospital its correlation with international standards.

## **MATERIALS AND METHODS**

Prospective, descriptive, observational study, carried out in the Newborn Service Born from Hospital during the period from July 2019 to July 2020. A total of 177 patients with medical indication for transfusion of any blood product. To establish whether the indication for transfusion was correct we are based on the criteria of US blood bank transfusion as seen in Table (1) [3]. The clinical indications that were assumed to be valid for indication of transfusion therapy with blood products were defined based on the impossibility of making times of coagulation and the presence of:

- Anemia plus: apnea, failure to gain weight, and / or oxygen dependence
- Ecchymosis
- Bleeding at puncture and / or digestive sites

Patients with an indication of exchange transfusion. Data was collected in a research instrument designed for such effect that included socio-demographic variables, anthropometric, indication, volume and type of blood product, exit condition and efficacy of the blood bank, to empty the information obtained in an electronic database created in the Epi-Info software version 6.04d (CDC, Atlanta, USA, 2001), to generate lists, frequencies and intervals; the data were grouped with a confidence interval of 95%. Two-way analyses were performed, for case and by transfusion event, transferring the information in the form of tables in Microsoft Excel and Microsoft Word Office XP.

## RESULTS

177 cases were studied, corresponding to sex female 48% (85/177), male 51.4% (91/177), a case of sexual ambiguity (0.6%) (Table 1). The average gestational age for the entire group was 37 gestational weeks (OS) (+/- 2 weeks and 6 days), with a range from 27 to 43 weeks; the mean of weight in grams was 2,257 (+/- 794.5g) with a range of 800 to 4,600g. The 62.1% (110/177) were newborns, little ones for age gestational, 35.6% (63/177) suitable for the age gestational and big 2.3% (4/177). I know she found clinical judgment from transfusion initial at 48% (85/177), Laboratory in 52% (92/177) (Table 2). According to the first indication for transfusion of some blood product, the most used initially it was the red blood cell concentrate packed (GRE) in 50% of cases (89/177), platelets 33.3% (59/177), plasma 14.7% (26/177) and whole blood in 1.7% (3/177). In the transfused group the number of average donors was 1.7 (+/- 1.1, 0-6) (Table 4). In 26.3% of the cases studied, the volume total transfused was 100% or more of the volume circulating, with 4 cases of more than 300%. From according to the exit condition it was found mortality in 41.8% (74/177) (Table 3).

**Table 1. Distribution According to Transfusion Indication Criteria And Sex**

	Sex Clinical Criteria (n=85)		Laboratory Criteria (n=95)	
	No.	%	No.	%
<b>Ambiguous</b>	1	1.2	0	0.0
<b>Female</b>	37	43.5	48	52.2
<b>Male</b>	47	55.3	44	47.8
<b>Total</b>	85	100.0	92	100.0

**Table 2 Distribution According to Gestational Age And Transfusion Criteria**

Gestational Age	Criteria		Laboratory Clinical		Total	
	No.	%	No.	%	No.	%
<b>27-29</b>	2	2.4	1	1.1	3	1.7
<b>29-32</b>	2	2.4	4	4.3	6	3.4
<b>32-36</b>	34	40.0	27	29.3	61	34.5
<b>&gt;37</b>	47	55.3	60	65.2	107	60.5
<b>Total</b>	85	100.0	92	100.0	177	100.0

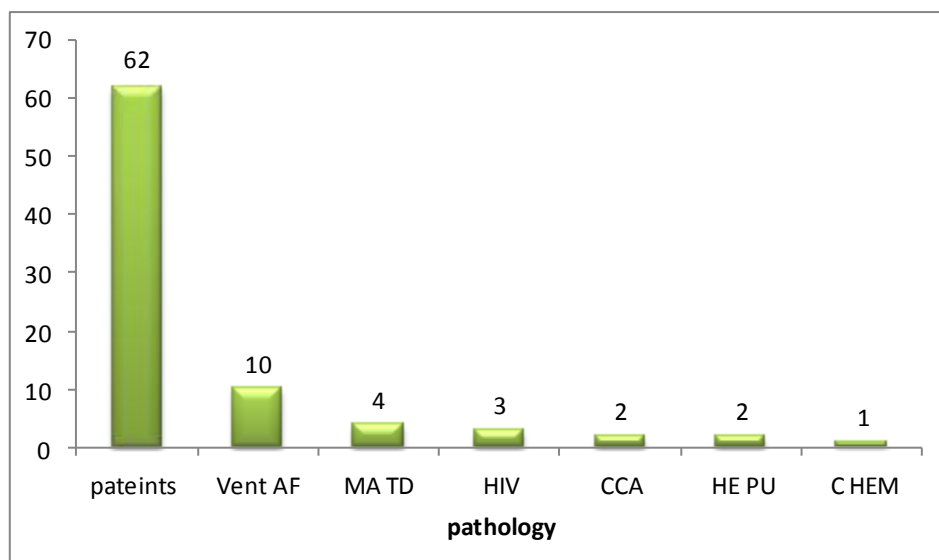
The number of requests for transfusions was 632, requiring platelet concentrate in 37.7% (238/632), plasma 32.9% (208/632), GRE 28.5% (180/632) and whole blood 0.9% (6/632); however, only 362 obtained the requested blood product by applying globular

concentrate at 136/180, platelets 99/238, plasma 122/208 and whole blood 5/6, the average volume administered was 109.4ml (+/- 124,383 ml), with a range of 10 to 1110 ml. The main cause for the non-supply of requested blood product was non-existence of blood type in the blood bank of the Hospital. The blood type of the blood was recorded transfused only in 49.7% (88/177), being the most frequent blood type O + (63.6%), followed by A + at 25%, B + 10.2%. The incidence of neonates with indication of transfusion was 12.6 / 1000 live births, which means 1.2 hatchlings for every 100 they will have indication of transfusion of any products sanguine

**Table 3. distribution according to donor number and the application or not of blood products**

Donor 8	No transfusion frequency		Transfusion 0 frequency		Total	
	No.	%	No.	%	No.	%
0	21	72.4	2	1.4	23	13.0
1	7	24.1	83	56.1	90	50.8
2	1	3.4	41	27.7	42	23.7
3	0	0	8	5.4	8	4.5
4	0	0	8	5.4	8	4.5
5	0	0	5	3.4	5	2.8
6	0	0	1	0.7	1	0.6
<b>Total</b>	<b>29</b>	<b>100</b>	<b>148</b>	<b>100</b>	<b>177</b>	<b>100</b>

The fact of not receiving the product was associated with indicated blood pressure and death (p = 0.00056) (Table 4). In addition, a relationship was identified between not having no donor and death recorded (p = 0.002) (Table 4). When analyzing the group diagnosed with sepsis, found a difference statistically significant between no transfusion and possibility of death (p = 0.0002).



**Fig1: Vent AF: ventilatory failure, MA TD: malformation digestive tract, HIV: hemorrhage intraventricular, CCA: congenital heart disease cyanotic, HE PU: Pulmonary hemorrhage, C HEM: headache hematoma**

Platelet concentrate was indicated in 238 occasions, being transfused only 99 of them, for 41.6% compliance with these events (administered in 96 patients) made when obtaining the product from the bank blood. It is important to mention that patients who had an indication for transfusion represent the 3.1% of the expenditures in the period under study and the 1.3% of the gross specific mortality (number of deaths in hospitalization area / number of expenses X 100).

## DISCUSSION

Transfusion in neonates as a clinical issue is still subject to discussion and controversy, with the information collected in the present study was able to determine the epidemiological profile of transfusion of blood products in the newborns from the Hospital; the incidence of transfusion of blood products was 12.6 / 1000 live births, reporting in the literature the use of transfusion of blood products in the last decades of 5.4 / 1000 born alive [8,11], more than double the incidence found in this study, probably by the degree of severity of the disease and the lack of other elements that prevent transfusions such as erythropoietin among others. The average number of transfusions per patient was 3.4 vs. 1.8. In this study, our incidence is almost double that reported by other authors, probably due to the degree of severity of the disease due to lack of resources or alternatives such as erythropoietin. Mortality secondary to transfusion was zero, and the mortality of patients required transfusion of blood products was 41.8%. The stratum that required the largest number of transfusions per patient, which per se is a cause of risk for infection, contrary to the reviewed literature that are the premature patients, obviously because studies reviewed are conducted in hospitals of the first world where they have technology needed to treat newborns from 25 weeks of gestation [2,4,5]. It is important to emphasize the fact that with three or more donors we would be guaranteeing you in a 100% transfusion of blood components to our patients, in such a way that if in a year 177 patients needed some transfusion, 531 donors per year would be needed for the Newborn service of the Hospital, high figure that cannot be extrapolated to other Hospital centers; remember that the Hospital only has a bank of blood to meet the needs of the block surgical and maternal-child doctor, what does consumption of high blood products as well how high is the deficit. The lack or little affluence donors, limited hours for collection blood supply and limited personnel are some of the factors responsible for the difference with studies carried out in healthcare centers that have the material, equipment and personnel necessary where they report a compliance 100% with 1.6 donors per patient [1,11]. Deaths mostly occur in infected patients, however we have a 29.8% that are the product of type alterations organic as: bleeding from hemorrhage intraventricular (ICH), malformations that predispose to infection and heart disease congenital that increase the lability of the patients. The improvement in the supply of blood products as a determining factor in mortality can be assessed when compliance with 100%, since they were produced deaths in bleeding patients who could not be transfused and whose total count of platelets was at risk range for intraventricular hemorrhage which can only be diagnosed with certainty through studies of image.

In the transfusion of blood products to neonates, it is still concluded regarding the guidelines and criteria that should guide the clinician, without. However we see that in the service of just born from the Hospital are not fulfilled complete criteria for blood

transfusions established by international guidelines, given in part by the multiple limitations with that is told and of which mention has been made. With the information collected we suggest the creation of a committee at the Hospital that monitor proper blood donation, and necessary hiring of personnel; promote an education campaign for older women reproductive life for their pre-conceptional education and make sure the pregnancy control is fulfilled, to detect the pathologies that predispose to intrauterine growth retardation, are detected infections and are treated in time, all this in order to decrease the infection rate and thus the need for transfusion of blood products [13,14].

### **Acknowledgments**

We thank to Presidency of Al-Ayen University for help us to complete this work.

### **Competing Interests**

The authors have declared that no competing interest exists.

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