



BLOOD BAGS AND DISPOSAL AND POSITIVITY SEROLOGICAL ON DONORS IN A BLOOD CENTER

DESCARTE DE BOLSAS DE SANGUE E A POSITIVIDADE SOROLÓGICA EM DOADORES EM UM HEMOCENTRO

DESCARTE DE BOLSAS DE SANGRE Y LA POSITIVIDAD SOROLÓGICA EN DONADORES EN UN HEMOCENTRO

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ABSTRACT

Objective: to analyze the prevalence of serological disposal in HEMOJATAÍ from 2003 to 2013. **Method:** cross-sectional, a retrospective study based on secondary data, performed in a Blood Center of Goiás/GO, Brazil. There were 1,371 discarded blood bags searched. For data analysis, SPSS Program 17 was used, presented by descriptive and inferential statistics from tables and a figure. Then there was the confrontation with the literature to discuss the results. **Results:** out of the cases evaluated, it was observed a higher incidence of cases with positive serology, prevailing hepatitis B (57.9%), HIV (10.6%) and syphilis (9.8%). **Conclusion:** it is necessary to joint strategies between the management bodies for the management of donors, with emphasis on organization, planning, and actions for the transport of people exposed to infectious diseases. **Descriptors:** Blood Donors; Hemotherapy Service; Serologic Tests.

RESUMO

Objetivo: analisar a prevalência dos descartes sorológicos no HEMOJATAÍ de 2003 a 2013. **Método:** estudo transversal, retrospectivo, a partir de dados secundários, realizado em um Hemocentro do Estado de Goiás/GO, Brasil. Foram pesquisadas 1.371 bolsas de sangue descartadas. Para a análise dos dados, utilizou-se o Programa SPSS 17, os quais foram apresentados pela estatística descritiva e inferencial a partir de tabelas e uma figura. Em seguida, houve o confronto com a literatura para a discussão dos resultados. **Resultados:** dos casos avaliados, verificou-se maior ocorrência de casos com sorologias positivas, prevalecendo hepatite B (57,9%), HIV (10,6%) e sífilis (9,8%). **Conclusão:** é preciso estratégias conjuntas entre os órgãos gestores para o manejo dos doadores, com ênfase na organização, planejamento e ações para o encaminhamento das pessoas expostas às doenças infectocontagiosas. **Descritores:** Doadores de Sangue; Serviço de Hemoterapia; Testes Sorológicos.

RESUMEN

Objetivo: analizar la prevalencia de los descartes sorológicos en HEMOJATAÍ de 2003 a 2013. **Método:** estudio transversal, retrospectivo a partir de datos secundarios, realizado en un Hemocentro del Estado de Goiás/GO, Brasil. Fueron investigadas 1.371 bolsas de sangre descartadas. Para el análisis de los datos fue utilizado el Programa SPSS 17, presentados por la estadística descriptiva e inferencial a partir de cuadros y una figura. En seguida, hubo un comparación con la literatura para la discusión de los resultados. **Resultados:** de los casos evaluados, se verificó mayor ocurrencia de casos con sorologías positivas, prevaleciendo hepatitis B (57,9%), VIH (10,6%) y sífilis (9,8%). **Conclusión:** es preciso estrategias conjuntas entre los órganos gestores para el manejo de los donadores, con énfasis en la organización, planeamiento y acciones para el envío de las personas expuestas a las enfermedades infectocontagiosas. **Descriptores:** Donantes de Sangre; Servicio de Hemoterapia; Pruebas Serológicas.

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INTRODUCTION

Blood is vital to the human life, which carries nutrients essential for all the tissues and organs of the body. Thereby, without blood, the tissues would die of starvation. Blood donation is also a problem of global concern, as there is a substance that can replace blood tissue in its entirety, thus, services and patients dependent on donors.¹ Blood donation is a spontaneous act, altruistic, voluntary and unpaid, and it depends on the donor's release who should be aware that the act of blood donation cannot harm his health or the receiver of that blood.²

The blood shortage is a worldwide extension problem, raising great concern. Lack of donors and high rates of clinical and serological ineligibility may result in deficits in the blood supply, causing adverse consequences for individuals and public health.³ However, it is extremely important to encourage a variety of ways to donate blood, by the loyalty of donors or permanent mobilization of the population.⁴

Brazilian study shows that 1.8% of the population are blood donors every year. However, this value does not meet the recommended by the World Health Organization (WHO), which indicates that 3-5% of the population should donate blood each year, being the ideal rate for the maintenance of stocks of blood and blood products of a country.⁵ In Brazil, there are no data available on how many people die or have some other kind of damage due to lack of blood or blood products.⁶

Transfusion services are structured in areas with different levels of complexity, depending on the activities they perform to obtain these products. Complete services perform all the steps of the blood cycle, corresponding to donor recruitment, clinical screening, blood collection, processing blood products, the serologic and immune-hematological analysis, storage, distribution and transfusion.⁷⁻⁸

These services are subject to legal provisions on the topic, (currently in effect the Collegiate Board Resolution (RDC) nº 34 of 11 June 2014), which approves the Sanitary Regulation on the requirements of good practice for blood therapy service, to develop activities related to the production of the blood cycle. The various fields and health services that perform transfusion procedures, including donor recruitment, collection, processing, testing, quality control and protection of the donor and the recipient and storage, distribution, transport and transfusion throughout the country should

submit the specific legislation while respecting the established norms. The regulations are intended to protect the donor and receiver, through control, processing, storage, distribution, transfusion of blood and its components. Derivatives of both venous blood as human blood must have institutional rules established for the proper implementation of these activities.⁹

In Brazil, Total Blood Bags (TB) should be 100% processed according to RDC N° 24 of 24 January 2002.¹⁰⁻¹¹ The blood products and blood derivatives come from the blood donation by a donor. Most patients with blood transfusion need only a component or a derivative.¹²

For the safety of receiver, all blood products undergo strict quality parameters such as clinical trial that is evaluating the clinical and epidemiological history, current health status, the candidate's habits and behaviors to the donation to determine if it can donate blood without injury to the receiver's health.^{5,13}

Thus, knowing the profile of unfit candidates is important for the safety of the blood therapy because it provides basis for the development of special strategies to improve the process of donor selection and quality of blood to be transfused in different transfusion services.¹⁴

OBJECTIVE

- To analyze the prevalence of serological disposals in 2003 JATAÍ HEMO 2013.

METHOD

Cross-sectional, descriptive study with a quantitative approach. The population was collected from secondary data of 21,280 forms of blood donors. The research was conducted in the Regional Blood Center in Jataí, Goiás (HEMOJATAÍ) in 2013, analyzing all disposals between January 2003 and December 2013.

The Regional Blood Center of Jataí (HEMOJATAÍ) was inaugurated in 09.25.1992, assisting all public hospitals, philanthropic and private in the city of Jataí and ten other cities in the southwest Goiás, the only collector of blood to this region (IBGE, 2010)¹⁵. Every month, the blood center receives an average of 230 donations of blood bags.^{3,16}

Searches of the records were through the HEMOVIDA, software developed by the Department of the Unified Health System (DATA/SUS), to increase the security and control of blood from collection to the distribution of the material. This data

collection took place in four stages, as can be seen in Figure 1.

Stages	Method
Stage 1	From all donations of 2003-2013, it was sought the blood records expunged, identifying all those that were discarded in the period and the reason (purge icon Hemovida software).
Stage 2	The second stage was held in serology icon Hemovida software, which identified the serology of these discarded bags.
Stage 3	The third stage was in a clinical trial icon, in which it was sought and identified the numbering of the donor and the type of donation.
Stage 4	Finally, we searched the records by numbering each donor to carry out the socio-demographic characteristics of these donors.

Figure 1. Stages used to implement the study.

The study sample consisted of records with some disposals occurred between the months of January 2003 to December 2013, totaling 1,389 blood bags discarded. As selection criteria, all discharges of bags for any disability and positive serology and as exclusion criteria all units, which presented disposal for validity, bags disruption, lack of kits to perform serology, plasma discharge by multiparous donors and plasma contamination by red blood cells. Also, the collections were also excluded carried out in the HEMOJATAÍ and bags whose sociodemographic data were not recorded in 50% or more of the items.

After these exclusions, a total of 1,371 blood bags discarded were selected. The data were computed by double entry and conferred at two different times, two different researchers. The data collection instrument contained the socio-demographic data with initial donor's name, gender, ethnicity, age, education, type of donation, ABO/Rh factor and serology.

This instrument has undergone a refining process, being evaluated by five experts in the area, selected by the Lattes Platform through the curricular analysis. The professionals analyzed the clarity and presentation of the same in appearance, relevance, and understanding.

After collecting the data, a database in Microsoft Excel® 2015 was elaborated. For the treatment and analysis, the descriptive and inferential statistics were used, and the data collected and subjected to computer processing, using the program SPSS (Statistical Package for Social Sciences for Windows) version 17.0.

This study complied with the principles of Resolution 196/96 of the National Health Council (CNS). This resolution was followed because the collection was held in its effective, and was registered in Brazil platform and approved by the Ethics Committee of the Federal University of Goiás (UFG) under Protocol 218/12.

RESULTS

Out of the 1,371 bags analyzed, the sociodemographic characterization of donors was investigated and it was observed that 995 (72.6%) were male, single 675 (49.2%) and 720 (52.5%) of white ethnicity and there was a difference in statistically significant ($p < 0.005$). Among the donors, 767 (55.9%) were younger than 35 years old, and 499 (36.4%) patients had incomplete primary education as education level, according to Table 1.

Table 1. Distribution of socio-demographic characteristics of 21,280 blood donors, from the evaluation of discarded blood bags (n=1371), HEMOJATAÍ, Southwest of Goiás, 2003-2013.

Variables	Total (1371)		Male (995)		Female (n=376)		p*
	n	%	n	%	n	%	
Marital status							
Single	675	49.2	511	37.3	164	12.0	
Married	425	31.0	317	23.1	108	7.90	
Divorced	75	5.50	38	2.80	37	2.70	
Other	191	13.9	127	9.30	64	4.70	
Not informed	5	4.00	2	0.10	3	0.20	0.000
Ethnicity							
Brown	720	52.5	509	37.1	211	15.4	
Mulatto	469	34.2	337	24.6	132	9.60	
Black	170	12.4	138	10.1	32	2.30	
Yellow	7	5.00	6	0.40	1	0.10	
Indigenous	5	4.00	5	0.40	-	-	0.037
Age							
≤ 35	767	55.9	571	41.6	196	14.3	
36+	604	44.1	424	30.9	180	13.1	0.080
Education							
Incomplete elementar school	499	36.4	363	26.5	136	9.90	
Complete elementar schoool	170	12.4	133	9.70	37	2.70	
Incomplete high school	82	8.00	82	6.00	27	2.00	
Complete high school	499	27.0	254	18.5	116	8.50	
Incomplete higher education	170	6.30	64	4.70	23	1.70	
Complete higher education	109	6.00	56	4.10	26	1.90	
Illiterate	370	2.60	28	2.00	8	0.80	
Not Informed	87	1.30	15	1.10	3	0.20	0.304

* ratio analysis, X² or Fisher when appropriate.

As for the kind donation of these discarded bags, 1,040 (75.9%) were voluntary donors, 132 (9.6%) donated for the first time, 87 (6.3%) were stockers, 47 (3.4%) were called,

and in 11 (8%) discharges this information in the donation form was not included, as can be seen in Table 2.

Table 2. Distribution of discharges occurring in HEMOJATAÍ by type of donation, 2003-2013

Type of donation	n	%
Voluntary	1040	76
1 st time	132	9,5
Stocker	87	6,3
Repetition	54	4,0
Called	47	3,4
Not Informed	11	0,8
Total	1371	100

Concerning blood typing, it was found that 642 (47%) discarded bags were of the type O/Rh+, 376 (27%) were A/Rh+, 150 (11%) were

B/Rh+, 33 (2.5%) were AB/Rh+, and 57 (4.2%) bags did not contain this information, as shown in Table 3.

Table 3. Distribution of disposals occurred in JATAÍ HEMO for blood ABO / Rh, 2003-2013

Blood type	n=1371	%
O+	642	47
O-	81	6
A+	376	27
A-	70	5
B+	150	11
B-	13	1
AB+	33	2.5
AB-	6	0.5

According to Table 4, all discharges occurred were analyzed due to positive serology in this period. Prevalence in 736 (54%) were by serologic causes, 426 (57.9%) of the bags were positive for anti-HBC, and 26 (3.5%) for setting HBsAg positive for Hepatitis

B disposal. In 72 (9.8%) cases were positive for VDRL, 78 (10.6%) were positive for HIV I/II and HIV-NAT thus positive for Human Immunodeficiency Virus. Also, 49 (6.7%) were positive for anti-HCV positivity setting for hepatitis C; 30 (4.1%) positive for Chagas

disease and 8 (1.1%) for Anti-HTLV. Regarding Irregular Antibody Test, they were positive in 3 (0.4%) bags and 3 (0.5%) had sickle cell trait bags. Still, in 44 (6%) blood bags discarded there were positive for more than one serologic marker.

Table 5. Blood donor distribution by gender, from the evaluation of discarded bags due to positive serology, HEMOJATAÍ, 2003-2013

Serological marker	Total (736)*		Male (503)		Female (233)	
	n	%	n	%	n	%
Hepatitis B						
Anti-HBc	426	57,9	280	38	146	19,8
HBsAg	26	3,5	19	2,6	07	1,0
Syphilis	72	9,8	51	6,9	21	2,9
Hepatitis C	49	6,7	36	4,9	13	1,8
HIV	78	10,6	64	8,7	14	1,9
Chagas	30	4,1	22	3,0	08	1,1
HTLV	08	1,1	02	0,3	06	0,8
PAI	03	0,4	-	03	03	0,4
Two serology +	37	5,0	26	3,5	11	1,5
Three sorology +	07	1,0	03	0,4	04	0,5

* ratio analysis, p <0.03, X² or exact when appropriate. Also, positive tests for different diseases.

The causes not serologic were also analyzed, in which 557 (90%) were by subjective disposal and most discarded represented male, 30 (5%) by a vote of self-exclusion, 18 (3%) by hemolysis, 11 (2 %) because of the collection, 6 (1%) for high hematocrit, totaling 622 bags discarded.

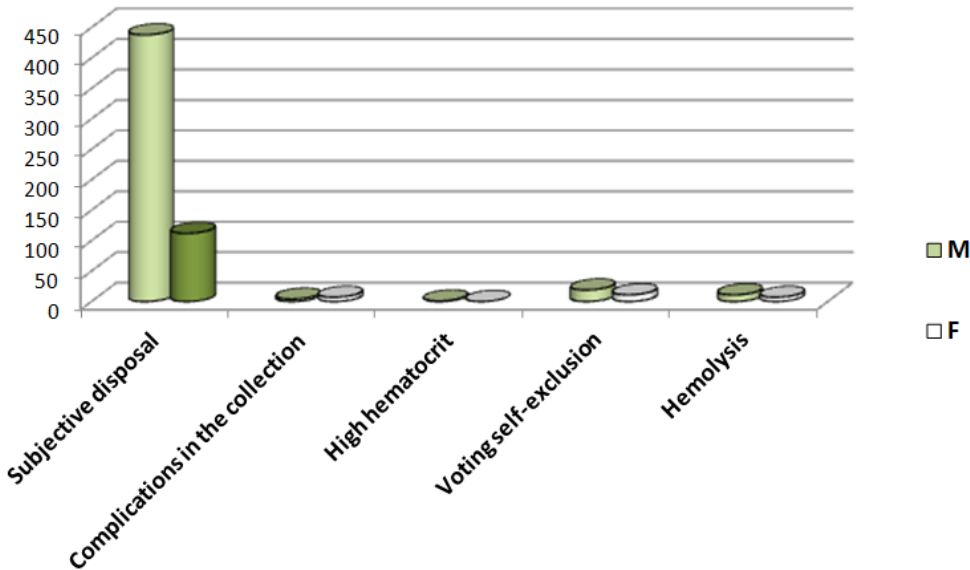


Figure 1. Characterization of disposals occurring not serologic causes, HEMOJATAÍ, 2003-2013.

DISCUSSION

Knowing the profile of unfit candidates is very important for safety in blood therapy, and provides basis for the development of special strategies, which improves the donor selection process and the quality of blood to be transfused in different transfusion services.¹⁴

Thus, the data from this study showed a donor population with a socio-demographic profile of young males in the age group of 35 years old. Studies in other parts of Brazil, with blood discharges in Paraná,¹⁷ in Rio Grande do Sul¹⁴, Campo Mourão-PR¹³, and Três Lagoas-MS¹⁸, found 54.1%, 68%, 61% and 69% of male donors respectively, corroborating these findings.

One study found that the lower prevalence in female blood donations may be associated with the occurrence of anemia in women of reproductive age, especially after the menstrual period, by the lack of iron.¹⁹

Regarding ethnicity, donors white self-reported, mostly. According to data from the Brazilian Institute of Geography and Statistics (IBGE)¹⁵, based on autosomal studies between the characteristic human types of the Midwest, European ancestry, accounts for 66.3% of the population of the heritage, the African ancestry accounts for 21.7% and 12% indigenous heritage. The composition of the population of Goiás as a whole is described as follows: 83.7% European, 13.3% African and 3% indigenous, justifying the predominance of whites in the study setting.

Regarding the level of education, just over a third of donors discarded blood had incomplete elementary school, and when the education level with the disposal of blood bags was joined, it was found that the lower the educational level, the greater the association with disposal. This fact may explain the high discard rates by positive serological markers of infectious diseases. Studies show that this type of population has less access to health services, sometimes using blood donation for diagnosis.^{5,20}

About marital status, it was observed that most discharges occurred in single people. This higher frequency may be linked to the fact that currently the population, especially males, carries more liberal habits and behaviors, as well as unprotected sexual activity.²¹⁻²² It is common in our culture, individuals who are exposed to the risk of contamination seeking one blood therapeutic service to donate blood, to identify their HIV status, therefore it is of great importance a clinical trial.

Regarding the type of donation, in this study, it was observed that among all discharges, a voluntary donation is the most prevalent (75.9%). They are considered volunteers who donate blood without interest, unselfishly, often having received blood at some point in their life, and they felt responsible for performing the act for others who need help.

A study in Campo Mourão-PR¹³ found that 54% of donations were voluntary, followed by stockers 45%, which is similar to our study. Stockers are considered those family donors and/or friends who have received blood, thus, are making a replacement of blood used. The called are those called by the Blood Center to increase the number of bags for some specific type of blood at the time is missing.

As for blood typing in Brazil, O and A blood groups are the most common, together these two groups cover 87% of the population, the B group is 10% and AB only three%²³, data this very similar to this study.

Regarding the disposal of blood bags, not serologic reasons, it was observed that in 90% of cases was subjective. Subjective disposal is one that occurs when the interviewer, based on a subjective impression, makes the donor a false fit due to suspicion of increased risk, accepting the donation, but does not use the blood and makes it unfit donor without permission. In any step of donation, he is aware that his blood will be discarded regardless of the results of serological tests.²⁴

In the 80s, this procedure was widely used, because it is not sure how the Human

Immunodeficiency Virus (HIV) could be contracted, what is its period and what were the individuals at risk for transmitting the disease.²⁴ Today, it is no longer justified, particularly with the use of PCR techniques to identify the viral genome in diseases with greater immunological window and risk of transmission - NAT-HIV-HCV NAT.

Concerning the serological markers analyzed discharges, there is most often positive for anti-HBc, present in more than half of the investigated discharges. The anti-HBc is detectable label during all stages of infection with hepatitis B virus, except the initial phase of viral exposure. This marker remains in infection even after HBsAg disappears, as well as chronic carrier stage.¹⁸ HBsAg was positive in 3.5% of the samples.

Several studies conducted in Brazil were positive for anti-HBc, being listed as the main cause of serologic disposal of blood bags and their frequency varied from 50% to 90%.^{5,13-14,17}

Regarding HIV, less than 10% of discarded bags were positive for Anti-HIV I/II and NAT HIV rate of 0.5%. The literature shows similar rates in other studies, and within the state of Paraná, the rate is 8.3% for the Anti-HIV.^{13,17} Another study in the city of Três Lagoas-MS, found 5.1 %, very similar to the values found in this study.¹⁸

Syphilis, 9.6% of discarded bags, can be considered as high frequency because it is a sexually transmitted disease easily treated, management and fully curable¹⁴ Thus, health services must be vigilant in conduct syndromic approach and permanently and effectively advice to its users.

Anti-HCV was present in 7.6% of bags discarded by positive serology, lower than that found in other studies, which reported the frequency of 19% in Três Lagoas/MG.¹⁸ We found in Paraná a frequency of 14%¹⁷ and 0.12% for Anti-HCV in Caxias do Sul-Rs.⁵ These discrepancies regarding the prevalence of hepatitis C is due to the lack of studies that reveal their magnitude. However, it is known that transfusion has been a major cause of transmission of such disease.

Finally, this study also evaluated the positive for Chagas disease, which accounted for 4% of discarded bags. A recent study in the Regional Blood Center in Uberaba-MG was found positive for 0.2% of bags, other studies showed 2.1% and 5.1%.^{17,25}

The number of people with Chagas' disease in Latin America ranged 18-20 million cases, according to the World Health Organization (WHO). In Brazil, it is estimated that there are approximately three million patients with

Chagas' disease, and Goiás is the Brazilian state with a higher rate of the disease.²⁶ Despite the high rate, the prevalence has decreased in Brazil due to strict controls of screening tests for the disease with a thorough clinical screening.

Thus, in this study, there are no previous records to confirm this reduction, which brings us to the fact that the municipality of Jataí-GO, being located in a highly agricultural region with a considerable amount of residents in the countryside may explain this rate high.

CONCLUSION

The blood bag disposals corresponded mostly to male donors and aged less than 35 years old, white, unmarried and with an incomplete education. We found a considerable rate of blood bag disposal by positive serology in which the Anti-HBC was more prevalent and subjective disposal among the causes not serologic.

From the moment that best know the causes of discards and the profile of these patients whose donations resulted in discharges, it is believed that joint strategic actions are possible among the responsible management bodies. Thus, proposing to health professionals training for the management of donors, organization, planning and actions to discard reduction and for increasing the safety in blood transfusion.

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