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EPIDEMIOLOGICAL PROFILE AND PREVALENCE OF CLINICAL AND SEROLOGICAL DISABILITY AMONG CANDIDATES FOR BLOOD DONATION

Perfil epidemiológico e prevalência de inaptidão clínica e sorológica entre candidatos à doação de sangue

Perfil epidemiológico y prevalencia de discapacidad clínica y serológica en candidatos a donación de sangre

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ABSTRACT

Objetivo: to describe the epidemiological profile and identify the prevalent causes of clinical and serological unfitness among donation candidates in the last five years. **Methods:** this is a cross-sectional, exploratory and analytical study. Data were obtained using the Hemote Plus® System. **Results:** most candidates were men (50.9%), aged 20 to 29 years (34.0%), white (66.7%), single (59.9%) with high school education (33.3 %) and spontaneous motivation (65.5%). Among them, 25.9% were considered unfit. The most prevalent causes of disability were: anemia (27.7%) and sexually transmitted infections (12.4%). Women (57.9%), individuals with a lower level of education (53.9%), and those with less than 39 years of age (65.5%) tended more toward sdisability. **Conclusion:** it is evident the need for educational practices and guidance on risk behaviors in the recruitment of donors and clinical screening, emphasizing the importance of the nursing professional in this context.

DESCRIPTORS: Blood donors; Donor selection; Serological tests; Communicable diseases; Risk factors.

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RESUMO

Objetivo: descrever o perfil epidemiológico e identificar as causas prevalentes de inaptidão clínica e sorológica entre os candidatos à doação nos últimos cinco anos. **Método:**trata-se de um estudo seccional, exploratório e analítico. Os dados foram obtidos por meio do Sistema Hemote Plus®. **Resultados:** a maioria dos candidatos eram homens (50,9%), de 20 a 29 anos (34,0%), brancos (66,7%), solteiros (59,9%) com ensino médio completo (33,3%) e motivação espontânea (65,5%). Dentre eles,25,9% foram considerados inaptos. As causas mais prevalentes de inaptidão foram: anemia (27,7%) e infecções sexualmente transmissíveis (12,4%). Tenderam mais à inaptidão as mulheres (57,9%), indivíduos menor nível de escolaridade (53,9%), e com menos de 39 anos (65,5%). **Conclusão:** evidencia-se a necessidade de práticas educativas e orientação sobre comportamentos de risco na captação de doadores e triagem clínica, ressaltando a importância do profissional de enfermagem neste contexto.

DESCRITORES: Doadores de sangue; Seleção do doador; Testes sorológicos; Doenças transmissíveis; Fatores de risco.

RESUMEN

Objetivos: describir el perfil epidemiológico e identificar las causas prevalentes de ineptitud clínica y serológica entre los candidatos a donación em los últimos cinco años. **Metodo:** se trata de um estudio transversal, exploratorio y analítico. Los datos se obtuvieron utilizando el sistema Hemote Plus®. **Resultados:** la mayoría de los candidatos eran hombres (50,9 %), de 20 a 29 años (34,0 %), blancos (66,7 %), solteros (59,9 %), com educación secundaria (33,3 %) y motivación espontánea (65,5 %). Entre ellos, el 25,9% fueron considerados no aptos. Las causas de discapacidad más prevalentes fueron: anemia (27,7%) e infecciones de transmisión sexual (12,4%). Las mujeres (57,9%), los indivíduos con menor nivel educativo (53,9%) y los menores de 39 años (65,5%) tendían más a la discapacidad. **Conclusión:** se evidencia la necesidad de prácticas educativas y orientaciones sobre comportamientos de riesgo em la captación de donantes y tamizaje clínico, destacando la importância del profesional de enfermeira en este contexto.

DESCRIPTORES: Donantes de sangre; selección de donantes; Pruebas serológicas; Enfermedades contagiosas; Factores de riesgo

INTRODUCTION

Blood, its components and derivatives from human blood tissue, have become an indispensable element for public health and for the daily operation of hematological and transfusion care in health systems.[1]

The emergence of hemotherapy as a matter of public policy and social interest began due to the emergence of the Acquired Immune Deficiency Syndrome (AIDS), and the increased incidence of transfusion-transmissible diseases. At that time, the blood public policy movement began in the country, with the implementation of a network of blood centers and the focus on voluntary and unpaid donation as an act of solidarity and benevolence.[2]

The difficulty common to all countries in maintaining blood stocks compatible with demand is evident. This occurs both because of problems in attracting donors, which highlights the need to develop new strategies, and because of problems related to the risk of disease transmission through transfusion, which can compromise the credibility of donation, blood centers, and blood itself.[3]

According to the Ministry of Health, only 1.6% of the Brazilian population is a voluntary blood donor, a percentage lower than that recommended by the World Health Organization (WHO), which is 3% to 5%[4]. Therefore, it is necessary to develop strategies to raise the population's awareness about the importance and need to donate blood, demystifying and clarifying issues that involve the act and, thus, capture a greater number of donors with the goal of providing transfusion support, enabling treatments and therapeutic procedures.[4]

Consolidation Ordinance No. 5, of September 28, 2017, regulates all hemotherapeutic activity in the country, through the principles and guidelines of the National Policy on Blood, Components, and Derivatives, regarding the collection, protection of the donor and recipient, collection, processing, storage, distribution, and transfusion of blood, its components, and derivatives.[5]

In order to ensure transfusion safety, Ordinance No. 1,353 of the Ministry of Health, issued on June 13, 2011, regulates that the candidate for blood donation must go through a selection process consisting of clinical and serological screening, aiming to prevent the transmission of infections to the recipient of blood transfusion. Only individuals assessed as suitable during the clinical screening should be referred for serological screening.[6]

The nurse plays an important role in blood donation, being one of the professionals responsible for clinical screening. The individuality of the candidate must be respected and a relationship of trust must be established. Moreover, the nurse plays a fundamental role in carrying out educational activities to attract new donors, and it is essential that the professional knows the motivations of candidates to donate blood and the most frequent causes of inability.[7]

The profile of clinical and serological unfitness of candidates for blood donation has already been addressed by some researchers, but there is still a lack of research on the profile of inability in hemotherapy in the current literature, so this study can serve as a basis for formulating new hypotheses and research questions.

We aimed to describe the epidemiological profile and identify the prevalence of the causes of clinical and serological unfitness among candidates for blood donation who have attended the Herbert de Souza Hemotherapy Service in the last five years. This study is justified because of the need to increase transfusion safety in hemotherapy services; knowing the profile of candidates and the causes of inability provides bases for the development of specific strategies to improve the process of attracting donors, as well as aims at the safety of the blood to be transfused. Moreover, knowing the prevalence of the main causes of unfitness may indicate whether changes are still needed in health education strategies.

METHOD

This is a sectional, exploratory, and analytical epidemiological study. The study population were all voluntary candidates for blood donation who attended the Herbert de Souza Hemotherapy Service in the last 5 years, from January 2015 to December 2019. The study was conducted at the Herbert de Souza Hemotherapy Service of the Hospital Universitário Pedro Ernesto (HUPE), located in the northern zone of the municipality of Rio de Janeiro. HUPE was inaugurated in 1950 as part of the hospital network of the Federal District Health Secretariat. With the progressive increase in demand for care, the hospital has become one of the largest health care teaching complexes, and is now a reference in several specialties and an important national center for training health care professionals.

The data were obtained by consulting the database obtained through the software used in the service (Hemote Plus ® system), containing information collected routinely and continuously.

To describe the epidemiological profile of the applicants, the following variables were analyzed: gender; date of birth; age; marital status; race/color; education. To describe the general prevalence of unfitness and the main causes of temporary and permanent clinical and serological unfitness, the causes of clinical unfitness described in the database and the results of serological tests for syphilis, hepatitis B and C, HIV, HTLV, and Chagas disease (VDRL/RPR; HBsAg, anti-HBc, anti-HCV; anti-HIV1/2; anti-HTLV I/II, serology for Chagas) were evaluated.

The data collected were tabulated and submitted to statistical analysis using the Statistical Package for Social Science for Windows (SPSS Statistics, version 19, from IBM). In this step, exploratory data analysis was performed, through which it was possible to characterize: the epidemiological profile of candidates for donation; the overall prevalence of inability; the causes of temporary and permanent inability; and the frequency of positive serology for syphilis, hepatitis B and C, HIV, HTLV, and Chagas disease.

For this description we used absolute and relative frequencies, and summary measures such as mean, standard deviation, and median. Bivariate analyses were also performed, using Pearson's chi-square test, considering a 5% significance level, to assess the association between the inaptitude outcome (yes/no) and the variables related to the candidates' profile.

The research protocol was submitted to the Research Ethics Committee of the Pedro Ernesto University Hospital in order to obtain access to the Herbert de Souza Blood Bank database. It was approved under opinion number 3.971.133. Since this is a research based on secondary data analysis, there was a request for waiver of the informed consent form (ICF).

RESULTS

Between January 2015 and December 2019, the Herbert de Souza Hemotherapy Service received a total of 25,377 applicants for blood donation, with 22.5% in 2015, 19.9% in 2016, 15.8% in 2017, 18.1% in 2018, and 23.7% in 2019. The highest frequency of donations occurred in the month of June in 2016 (2.70%) and in the month of July in 2019 (2.70%).

It stood out from the univariate analyses that the majority of candidates were male 1298 (50.9%), young people aged 20 to 29 years 8620 (34.0%), mostly white 16924 (66.7%) and single 15192 (59.9%). Regarding education, the group with complete high school education predominated 8450 (33.3%). Most had spontaneous motivation 16615 (65.5%) to donate blood (Table 1).

Table 1. Epidemiological profile of donation candidates who attended the HUPE/UERJ Hemotherapy Service (n=25377). Rio de Janeiro, RJ, Brazil, 2015/2019

Variable	Absolute Frequency n=25377	Relative Frequency (%)	Accumulated Relative Frequency (%)
Gender			
Female	12469	49,1	49,1
Male	12908	50,9	100,0
Age Group			
Up to 19 years old	2268	8,9	8,9
20 to 29 years old	8620	34,0	42,9
30 to 39 years old	5935	23,4	66,3
40 to 49 years old	4259	16,7	83,0

50 to 59 years old	3287	13,0	96,0
60 years old or more	1008	4,0	100,0
Skin Color			
White	16924	66,7	66,7
Brown	6794	26,8	93,5
Black	1504	5,9	99,4
Yellow	146	0,6	100,0
Indigenous	6	0,0	100,0
Didn't answer	3	0,0	100,0
Marital status			
Single	15192	59,9	59,9
Married	8141	32,1	92,0
Divorced	1141	4,5	96,5
Maritally Separated	486	1,9	98,4
Widower	229	0,9	99,3
Legally Separated	188	0,7	100,0
Education			
Illiterate	15	0,1	0,1
Incomplete elementary school	1116	4,4	4,5
Complete elementary school	1490	5,9	10,4
Incomplete high school	1350	5,3	15,7
Complete High School	8450	33,3	49,0
Incomplete higher education	5691	22,4	71,4
College degree complete	7259	28,6	100,0
Didn't answer	6	0,0	100,0
Reason for attendance			
Spontaneous	16615	65,5	65,5
Replacement	8555	33,7	99,2
Scheduled	202	0,8	100,0
Convocation	5	0,0	100,0

Of all applicants for blood donation, 73.3% (n=18,608) were considered suitable to donate, 204 (0.8%) gave up the donation still in the screening and 6,565 (25.9%) were considered unfit. Regarding the reason for inability, 5,525 (22.6%) were inappropriate in the clinical screening and 840 (3.3%) in the serological screening (Graph 1).

Among the 6,565 candidates for donation considered unfit, most were female 3800 (57.9%), aged between 20 and 29 years 2228 (33.9%), referred race/color white 4129 (62.9%), were mostly single 4120 (62.8%) and had completed high school 2314 (35.2%) (Table 2).

Table 2. Epidemiological profile of candidates unfit for donation. Hemotherapy Service HUPE/UERJ (n=6565). Rio de Janeiro, RJ, Brazil, 2015/2019

Variables	Absolute Frequency n=6565	Relative Frequency (%)	Accumulated Relative Frequency (%)
Gender			
Female	3800	57,9	57,9
Male	2765	42,1	100,0
Age Group			
20 to 29 years old	2228	33,9	33,9
30 to 39 years old	1393	21,2	55,2
40 to 49 years old	1107	16,9	72,
50 to 59 years old	838	12,8	84,8
60 to 69 years old	322	4,9	89,7
Up to 19 years old	677	10,3	100,0
Skin Color			
White	4129	62,9	62,9
Brown	1906	29,0	91,9
Black	495	7,6	99,5
Yellow	34	0,5	100,0
Indigenous	1	0,0	100,0
Marital Status			
Single	4120	62,8	62,8
Married	1863	28,4	91,2
Divorced	335	5,1	96,3
Maritally Separated	115	1,7	98,0
Widower	77	1,2	99,2
Legally Separated	55	0,8	100,0
Education			
Illiterate	8	0,1	0,1
Incomplete elementary school	358	5,5	5,6
Elementary school complete	435	6,6	12,
Incomplete high school	426	6,5	18,7

High school complete	2314	35,2	53,9
Incomplete higher education	1436	21,9	75,8
Higher education complete	1586	24,2	100,0
Didn't answer	2	0,0	100,0

Among those unfit in the clinical screening (n=5. 525), some causes of inaptitude for clinical manifestations were highlighted; for risky sexual behavior, such as: sexual intercourse with a new partner, multiple partners, sexual intercourse without condom, men who have sex with men, partner with increased risk, HIV-positive partner; and for other risky behaviors, such as: tattooing, piercing performed with aseptic technique and piercing performed without safety in the last 12 months, use of inhalable drugs, drug-using partner, permanent makeup done less than 12 months ago. Among the clinical unfitness causes, the most prevalent were: anemia, in 1447 candidates (27.7%); current or past history of STIs, in 685 (12.4%); and risky sexual behavior in 541 (9.8%).

The majority of unfit candidates for sexual risk behavior were due to sexual intercourse with a new partner (46.1%). The criterion of multiple partner is defined by sexual intercourse with more than 5 partners in the last 12 months. Considering the causes of unfitness for other risk behaviors, tattooing stood out in 128 candidates (48.3%), among the 265 who presented other risk behaviors for transmission of bloodborne infections.

The candidates who passed the clinical screening had their blood samples collected for serological tests. Of these, most were considered suitable in the serological screening. Among the unfit, the major cause of serological unfitness was syphilis.

In the bivariate analyses, considering a significance level of 5% ($p<0.05$), all variables tested were associated with the inability outcome (yes/no): sex; race/color; age group; education; marital status.

Therefore, there was a dependence between the individual characteristics of the candidates and the unfitness outcome. Women were more likely to be unfit than men (57.9% vs 42.9%, p-value 0.000). White donors tended to be more unfit than non-white donors (62.9% vs 37.1%, p-value 0.000). Donors younger than 40 years tend to be more unfit than older donors (65.5% vs 34.5%, p-value 0.000). Donors with lower levels of education (up to complete high school) were more likely to be unfit than those with higher levels of education (53.9% vs 46%, p-value 0.000) and donors without mates had a higher frequency of unfit compared to those with mates (69.9% vs 30.1%, p-value 0.000) (Table 3).

Table 3. Description of the bivariate analyses between the outcome inaptitude (yes/no) and individual characteristics of candidates for donation. Hemotherapy Service HUPE/UERJ. Rio de Janeiro, RJ, Brazil, 2015/2019

Variable	Able (n=18.608)		Unable (n=6.565)		χ2*	p-value
	n	%	n	%		
Gender					272,855	
Female	8565	46,0%	3800	57,9%		0,000
Male	10043	54,0%	2765	42,9%		
Skin Color					58,314	
White	12654	68,0%	4129	62,9%		0,000
Non-white	5951	32,0%	2436	37,1%		
Ignored	3	0%	0	0%		
Schooling					85,515	
Up to high school complete	8804	47,3%	3541	53,9%		0,000
College degree incomplete or higher	9800	52,7%	3022	46,0%		
Did not answer	4	0%	2	0%		
Marital Status					59,549	
With partner	6583	35,4%	1978	30,1%		0,000
No partner	12025	64,6%	4587	69,9%		
Age Group					2,730	
Under 39 years old	12391	66,6%	4298	65,5%		0,000
40 years and older	6217	33,4%	2267	34,5%		

*χ2 = Pearson's chi-square test.

DISCUSSION

Of the 25,377 candidates for donation in the last 5 years, men predominated, aged between 20 and 29 years, white, single, with complete high school education, and with spontaneous motivation for donation. In Santa Catarina, in a study with 14,517 donors, 54.1% were men.8 Other studies corroborate the findings of this study, finding a higher prevalence of male candidates.9-10 In contrast to these findings, other studies carried out in the Federal District and Rio de Janeiro also found a higher prevalence of women.[11-12]

Most donors were 20 to 29 years old; younger groups are more likely to donate blood voluntarily.[13] In a survey in Rio de Janeiro, for example, 73.8% of the donors were young people under 39 years old.[12] However, a survey carried out only with elderly blood donors, argued that the recruitment should not focus only on the young, because in some cases, older individuals may present more requirements needed to donate when compared to the young.[14]

As for race/color and marital status, whites and singles stood out. In Florianópolis, a survey recorded that, among more than 200,000 donors, most were white.[15] A similar finding was found in a cross-sectional study, with 641 interviewees, in which most were white and single.[16] Considering marital status, the same profile was found in a blood center in the Southern Region of Brazil.[17] As for education,

a higher frequency of candidates with complete high school education was found. In Fortaleza, the same finding was observed; most candidates had completed high school.[18] In hemotherapy services in the South of Brazil and in Rio de Janeiro, the prevalence was of donors with incomplete high school education.[12,19] The Hemotherapy Service of the present study is located in a university center, so that continuous activities are carried out to capture this group, being developed by the extension project of the College of Nursing, entitled "Blood: overcoming fear while guaranteeing life".[20] Nevertheless, the highest frequency of donors was not observed among those with incomplete/complete college education, showing that greater attention and efforts are still needed to capture this group.

As for the reason for attendance, spontaneous donation prevailed. According to Consolidation Ordinance No. 5, of September 28, 2017, this type of donation is made by people motivated by the goal of maintaining the blood stock of hemotherapy services, and arising from an act of altruism, without identifying the name of the possible recipient.[5] In a survey conducted in a municipality in southern Brazil, the data revealed that in first place was the feeling of helping people and volunteerism, representing 75.8% of donations.[19]

In relation to unfitness in the clinical screening, causes of unfitness were observed for clinical manifestations, risky sexual behavior and other risk behaviors related to bloodborne disease transmission; in addition, 840 individuals, despite being suitable in the clinical screening, were considered unsuitable in the serological screening, a limiting factor for the maintenance of blood bank stocks. In a Regional Blood Center in the state of Rio Grande do Sul, the analyses performed during 5 years highlighted that the profile of fit was greater than 70% in relation to unfit.[21] In 2017, according to ANVISA data (2017), of the people who sought services to donate blood, 20% were clinically unfit and 3.1% unfit by serology, both percentages similar to those described in the present study.[22]

Regarding clinical unfitness, the most frequent causes were: anemia, previous or current history of sexually transmitted infections, and risky sexual behavior. According to Rocha (2018)[23], in women, anemia represented the greatest cause of clinical unfitness, followed by hypotension. In men, on the other hand, anemia was the least prominent unfitness. According to Freitas[24] (2019), the following clinical inaptitudes stood out: hypertension/hypotension; high or low hemoglobin/hematocrit if medication use.

Considering those unfit due to risky sexual behavior, the greatest cause of unfit was sexual intercourse with a new partner, followed by multiple partnership - sexual intercourse with 5 partners or more in the last 12 months. In a study carried out in Santa Catarina, the greatest cause of unfitness was sexual intercourse without a condom, followed by multiple partnerships.[13] The latter was also the greatest cause of unfitness in other studies.[18,25] Regarding unfitness due to other risk behaviors for transmission of diseases by blood, the highest frequency observed was for tattooing less than 12 months ago. In a survey carried out at the Hemotherapy Service of Hospital Santo Angelo, men were more unfit for tattooing, piercing, and acupuncture and for drug use.[25]

Regarding serological unfitness, the most prevalent cause in this study was syphilis. In a survey carried out in the Hemonúcleo de Divinópolis-MG, the highest rate of positivity was for syphilis, followed by hepatitis B.[26] In a city of Amazonas, regarding the seroprevalence of infectious diseases in blood donors, hepatitis B stood out, followed by coinfection by two or more pathogens, syphilis, hepatitis C, and Chagas disease.[27] In a previous study carried out at Serviço de Hemoterapia Herbert de Souza, syphilis was the sexually transmitted infection that caused the highest frequency of serological unfitness among candidates for donation, followed by hepatitis B and hepatitis C, and no unfitness for HIV or HTLV was observed.[28]

Therefore, it is necessary to create health education strategies that reach this group in particular. The way the content is discussed with young people can define their attitudes, making them put into practice what has been discussed and learned. It is important to bring young people closer to the health services, so that they can solve their doubts. Primary care is the ideal health service for an approach on the subject and the prevention of these diseases.[29]

It is necessary that health professionals, especially nurses, talk to the population about preventive strategies for STIs, involving sex education, knowledge about STIs/HIV, ways of infection and prevention, counseling on safe sex, and clarification on how behavior can facilitate the acquisition of an STI.[30]

CONCLUSION

It is noted that the dissemination of issues related to blood donation by health professionals is fundamental, aiming to spread reliable information and increase the attraction of potential donors. In addition, it demonstrates the importance of valuing the quality of the blood, aiming at the safety of the donor and the future recipient, through clinical and serological screening.

A deficit of knowledge about the basic criteria for blood donation was observed, considering that many candidates declared risk behaviors and still considered themselves able to donate. Given this, it reinforces the importance of guidance by nurses, an important agent in this process, through nursing consultations and educational activities, emphasizing the basic conditions for donation, the importance of using condoms and practicing safe sex, in order to minimize the vulnerability of this population, either by the multiplicity of partners or by adopting other risky behaviors.

It is worth mentioning that the present study has some limitations, as it portrays the unique reality of a hemotherapy service located in Rio de Janeiro, pointing to the need for

further studies that aim to identify the prevalence of clinical and serological disabilities in other locations.

This study can contribute to the teaching and nursing care, as it discusses the importance of blood donation, demystifying issues related to this theme and describing how behaviors and individual risk situations can directly influence the inability of a candidate to donate. In addition, it reinforces the importance of the nurse's role in clinical screening and health education in hemotherapy and contributes with subsidies for the production of new analyses about the theme, considering the scarcity of studies on the subject in the current scientific literature.

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