ISSN: 2348-1927

Research Article

Annals of Biological Sciences
2020, 8 (2):44-49

Demographics of Blood Transfusion in Lebanon: A Retrospective Study

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ABSTRACT

Lebanon is a small country with a developing healthcare system. Healthcare institutions ranges from small peripheral hospital, to large university medical centers. When it comes to blood transfusion, different blood bank follows different guidelines, in terms of techniques used during the transfusion process and collecting data. Thus, in Lebanon, demography on a national level is not well established.

This retrospective study shows the demography (sex, age, repartition according to areas) of blood transfusion in Lebanon. The data were collected from 35 hospitals across the country, during the year of 2016. The exclusion criteria for transfusion and adverse reactions are reported as well.

This study showed a huge difference between the number of voluntary blood donors (15.5%), and the donors by compensation (84.5%); similarly, a large statistical difference was noted between male donors (98%), compared to female donors (2%);

In Lebanon, donors between 25 years and 44 years old are the highest percentage (58.95%), followed by donors between 18 years and 24 years old (25.83%). The most frequent undesirable transfusion reactions were chills and hyperthermia in 0.25% of all transfusions, whereas the most common reason for deferral of transfusion was due to positive serology in 2.36%.

Awareness campaigns and blood drives should be done on all Lebanese territories, by the government and non-governmental organizations, in order to increase the number of donors, especially the young generation and women.

Keywords: Blood transfusion, Lebanon, Healthcare system.

INTRODUCTION

Blood transfusion is "the transfer of blood or blood components from one individual (donor) to another (recipient)" [1]. Nowadays, transfusion remains essential, however it presents many risks and undesirable manifestations such as shivering, hyperthermia, urticaria, anaphylactic shock, hemolytic shock, acute pulmonary edema, etc. linked to reactions and accidents associated with blood donation and the transfusion of blood products [2].

Since blood transfusion are not only important, but also lifesaving, it is imperative to ensure that each human being has access to blood and its derivatives in a timely manner, as safe as possible, and in sufficient quantity to meet all of his needs. Therefore, an adequate and secure supply of blood products should be an integral part of any national health policy [3,4].

It was not until the twentieth century that transfusion manifested a considerable rise following the discovery of the ABO erythrocyte blood groups, then of the Rhesus system. These discoveries have reduced the major risks of serious transfusion immunologic incompatibility reactions developed by the recipient. Over the next 40 years, transfusion reduced mortality due to medical, surgical, obstetric and

bleeding due to accidents. Subsequently, transfusion of blood and its isolated labile components became effective, and more often could not be replaced by any other therapeutic alternatives [5,6].

As blood transfusion became an essential part of medical and surgical management, and as there is lack in the national policy of blood transfusion in Lebanon, this study was performed to have a general idea about demographics and adverse reactions, in order to try to ameliorate this vital aspect of the healthcare system in Lebanon.

MATERIALS AND METHODS

This is a retrospective study, data were collected from 35 hospitals (4 hospitals in Beirut, 10 in Northern Lebanon, 2 in Southern Lebanon, 13 in Mount Lebanon, 3 in Beqaa, 2 in Baalbek-Hermel and 1 in Nabatiyeh). A standardized questionnaire was addressed to the directors of the blood banks, consisting of three parts, donors and blood collection, exclusion criteria and adverse reactions of transfusion.

The statistical data were analyzed using STATA version 13 software, then the graphs and tables were drawn with Microsoft Excel.

Authorization for collection, analysis and publication of results was given from the Lebanese ministry of public health.

RESULTS AND DISCUSSION

Distribution of donors

Table 1: Number and percentage of donors of whole blood and apheresis.

	Whole blood	Apheresis donors	Percentage
Voluntary Donors	5852	1482	15.5%
Compensating Donors	37488	2480	84.5%
Percentage	91.6%	8.4%	100%

The number of voluntary donors, people who donated blood on their own initiative, is equivalent to 15.5%. Family compensating donors, donors to family and friends, are 84.5% of total donors (Table 1).

Distribution of donors by sex

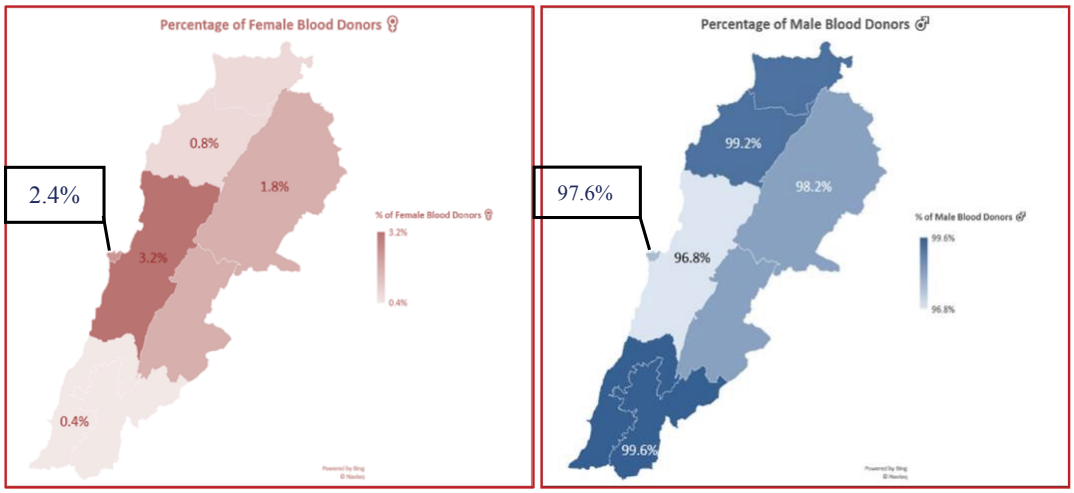

Figure 1: Distribution of donors, males and females, according to Lebanese Governates. The donors are male in the majority of donations, with a percentage around 98%, while female donors are only around 2% of the total donors; The highest percentage of female donors was in Mount Lebanon 3.2%, and in Beirut 2.4%, while the percentage decrease to 0.8% and 0.4% in the North and South Governates respectively.

Distribution of donors by age groups

Table 2: Percentage of different age groups of donors.

Age	Percentage
18 to 24 years	25.83%
25 to 44 years	58.95%
45 to 64 years	15.1%

Above 65 years	0.12%

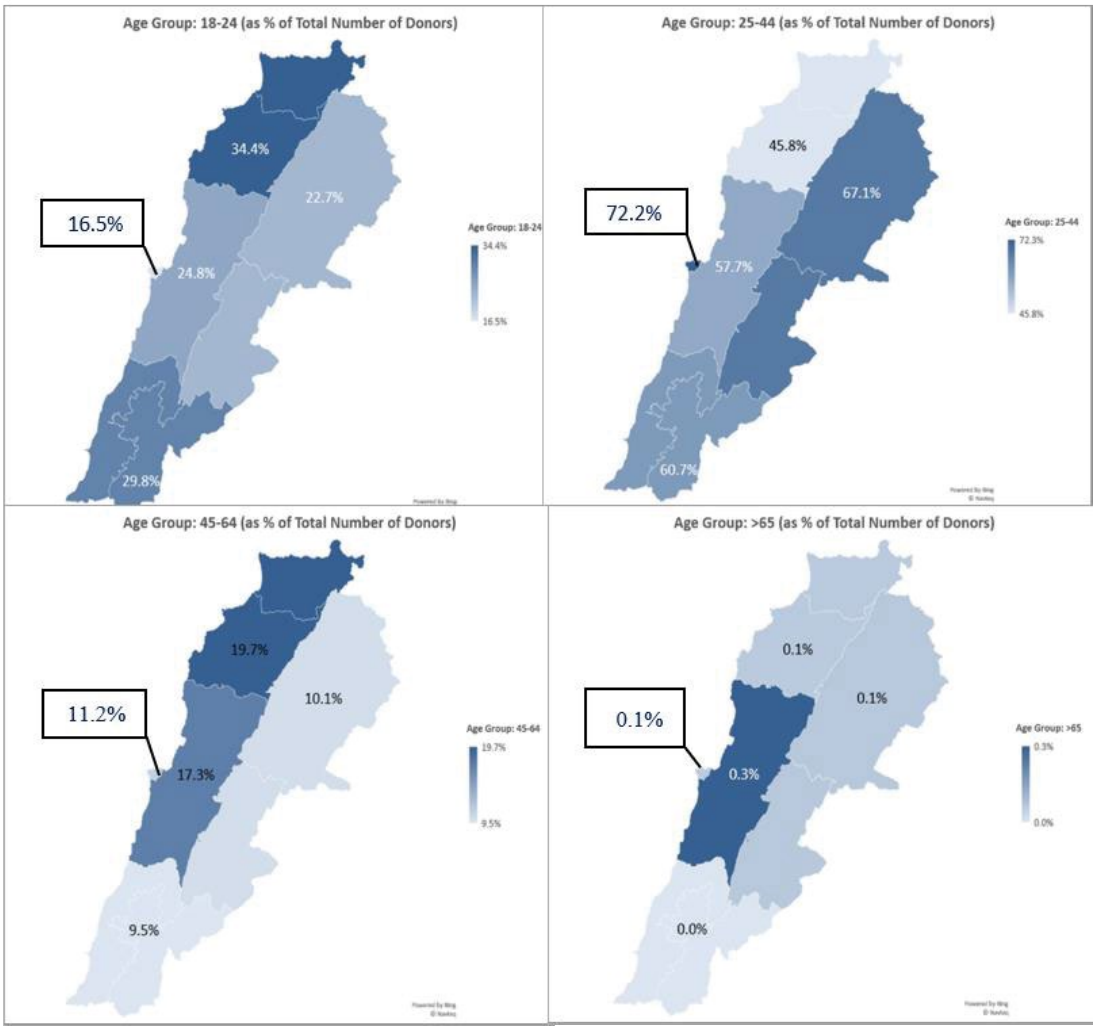

Figure 2: Distribution of different age groups according to Lebanese Governates.

The highest number of donors are between 25 years and 44 years old, followed by donors between 18 years and 24 years old, then donors between 45 years and 64 years old. Lastly, donors above 65 years old, have the lowest percentage (Table 2). The highest percentage of donors in the age group 25 and 44, is located in the capital Beirut (Figures 1 and 2).

Number of potential donors excluded from donation, by reason of exclusion

Table 3: Percentage of different exclusion criteria from donation.

Exclusion reasons	Number	Percentage
Positive serology (pre-donation)	1295	2.36%
Infection, flu…	1115	2.04%
Surgery, tattooing, piercing, endoscopy…	941	1.72%
Low weight	165	0.30%
Blood pressure	221	0.40%
Low Hemoglobin	763	1.39%
Other biological contraindications (WBC, platelets, etc.)	703	1.28%
Risky sexual behavior	282	0.51%
Chronic donor disease	244	0.45%
Travel to an endemic area	341	0.62%
History of hepatitis, AIDS, Syphilis,	118	0.22%
Recent vaccination	103	0.19%
Dental problems	403	0.74%
Other Reasons	766	1.40%
Total Number of Excluded Donors	*7460*	*13.62%*

The most common reason of exclusion is a positive serology. After phlebotomy, blood is tested for common blood transmitted infections such as Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and Syphilis, with rapid tests. If any of these is positive, the patient is excluded from donation. The percentage of positive serology in Lebanon is 2.36% of total donations. The percentage of Infection and flu, which is a clinical diagnosis based on symptoms like fever, chills comes second with 2.04%. Other reasons such as surgery, tattoo, piercing or endoscopy are 1.72%, while 1.39% is due to low hemoglobinemia (Table 3).

Number of donors excluded from donation

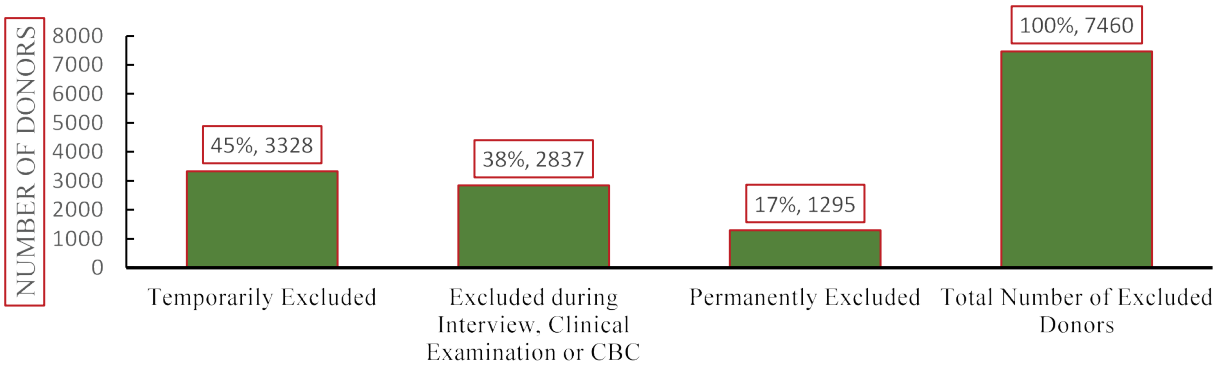

Figure 3: Percentage of excluded donors, according to group of exclusion.

Patient excluded temporarily, were eligible to blood transfusion later on. These included donors with infection or flu-like symptoms, patients who had dental problems, received a recent vaccination, or donors who underwent recent surgery or endoscopy. Patient excluded permanently were due to Positive serology. Temporarily excluded donors were 45%, donors excluded following pre-donation interview and physical exam were 38%, while 17% were excluded permanently (Figure 3).

Number of adverse reactions during transfusions

Table 4: Percentage of different adverse reactions.

Accumulated adverse reactions	Number	Percentage
Immunological hemolysis due to ABO incompatibility	2	0.003%
Immunological hemolysis due to other allo-antibodies	2	0.003%
Non-immunological hemolysis	1	0.0015
Post-transfusion purpura	18	0.027%
Allergy/Anaphylaxis/Hypersensitivity	78	0.12%
Chills hyperthermia reactions	166	0.25%
Transfusion-Related Acute Lung Injury (TRALI)	7	0.01%
Graft versus host disease	0	0
HIV-1/2 infection associated with transfusion	0	0
HBV infection associated with transfusion	5	0.008%
HCV infection associated with transfusion	0	0
Septic shock from bacterial contamination of the donor unit	0	0
Malaria associated with transfusion	0	0
Other parasitic infection associated with transfusion	0	0
Circulatory overload associated with transfusion	5	0.008%
Metabolic reaction	0	0
Other causes	47	0.071%
Total number of adverse reactions	*331*	*0.5015%*

During transfusions, recipients of blood contents may have adverse reactions. Hyperthermia and chills were the most common with a percentage of 0.25%, while allergies, anaphylaxis and hypersensitivity were 0.12% of all transfusions. The percentage of total adverse reactions is around 0.5% (Table 4).

DISCUSSION

The culture of blood donation remains poor in Lebanon, this is confirmed by the low percentage of voluntarily donors 15.5%, in comparison with voluntary donors in the Arab world, where the percentage varies between 1% in Egypt and 96% in Kuwait [2].

On the other hand, familial compensatory donations have a high percentage 85%, which shows the availability of donors, when the recipient is a relative or a friend.

In this study, 7460 potential donors were excluded from donation for multiple reasons; temporary exclusion in 45% of cases, following a medical interview, a clinical examination or a complete blood count test in 38% of cases. Permanently excluded donors were 17% of all donors. The highest percentage of excluded donors were donors with positive serology; for this category, blood donation constitutes a fortuitous discovery of a serious viral infection, which opens a window on the interest of awareness campaigns and screening for infections transmitted by blood, sex, and maternal-fetal transmission.

Data showed that 98% of donors are male, female donors are only 2%; the low percentage of women donors is also present in the majority of the Arab world with the exception of Egypt, Morocco and Tunisia, which have a percentage of female donors at 54%, 40% and 35% respectively. In France, donors are almost on an equal footing, with a higher percentage of female donors than male donors [7].

The age of donors varied mostly between 25 and 44 years, with a percentage of 58.95% having an age between 18 and 24 years at 25.83% and 45 to 64 years at 15.1%; a small but still existing percentage is seen at the age of 65 and over. In the countries of the Eastern Mediterranean Region, donations under the age of 18 from Kuwait, Qatar and Saudi Arabia were 0.1%, 0.7% and 0.3% respectively; in Kuwait, 0.6% of donations came from people aged 65 and over [5,8]. In France, the majority of donors are in the 20-24 age group [4].

The most common cause of exclusion of donation was a positive serology (2.36%). Rapid tests are done for the presence of HIV, Hepatitis B, Hepatitis C and Syphilis before the beginning of transfusion. These are mostly sexually transmitted diseases and most commonly in sexually active young adults. The prevalence of positive serology between donors should raise concerns of Sexually transmitted diseases in Lebanon. Awareness campaigns are a must to prevent the spreading of these infections, especially for the young population.

Blood transfusion is sometimes prone to complications or side effects, in donors and in recipients. The data showed that the most common complications of transfusion were chills and hyperthermia in 0.25%, allergies, anaphylaxis and hypersensitivity (0.12%); Hence the need to monitor all patients before and after transfusion. Moreover, vigilance towards a transfused patient has progressed in recent years [9,10].

CONCLUSION

Blood transfusion is an essential tool in medicine nowadays, and investment in this sector should be done, not only on institutional levels, but on a national level as well. Donors encouragement by national campaigns is essential to increase the number of regular voluntary donors, especially donors with rare blood groups. Also, the young population aged between 18 and 24, can be encouraged to donate more often by doing donation drives at universities, malls and events. This age group is essential in donation, as they are the youngest and healthiest. Advertisements on the social media platforms is an easy way to reach this population. Female donors should also be encouraged to donate; There is a very low percentage of female donors compared to male donors in Lebanon, which is mainly due to misconception. If the number of women donors increased, the number of voluntary donations in the country would almost double. The campaigns should be done in the cities as well in rural areas, such as the north, the south and Baalbeck-Hermel. Lastly, as the number of deferred donation due to positive serology is the highest, awareness campaigns for blood/sexual transmitted diseases such as (HIV, HBV, HCV and syphilis) should be done on a regular basis, and mass screening can be considered especially for the young population. Public awareness is not only the government responsibility, NGOs can play major roles in encouraging the young, the women and the general population. Few questions remain, why is the highest female donors, and donors in general, located in Mount Lebanon and Beirut? What about the prevalence of each pre-tested infections such as HIV, Hepatitis and syphilis? Is it high among the donors? And are these donors notified by the blood bank post phlebotomy?

Limitations

The data were collected from 35 out of 75 hospital's blood banks in Lebanon. Although the number of hospitals who responded to the questionnaire is high, not all are large hospitals with advanced blood banks.

These hospitals are located in all the Lebanese governates, but some governates like Nabatiyeh and Balbeck-Hermel were represented by only 1 hospital.

Red Cross blood banks were not included in this study, nor any other Non-Governmental Organizations (NGO), who play a major role in blood transfusion system in Lebanon. The Lebanese Red Cross have 13 blood banks distributed all over Lebanon.

DECLARATION OF CONFLICTING INTERESTS

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this thesis.

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