



**Research Article**

JMR 2021; 7(6):172-174  
November- December  
ISSN:2395-7565  
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www.medicinarticle.com  
Received:31-08-2021  
Accepted:13-10-2021

## Prevalence of irregular antibodies in blood donors at Yaoundé Central Hospital, Cameroun

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### Abstract

Blood transfusion is a therapy that presents immunological risks due to the possible presence of irregular antibodies in donor or recipient blood. It is therefore recommended to reseaech irregular antibodies in both donors and recipients' blood during pre-transfusional tests. Data relating to the search for irregular antibodies being scarce in our country, we carried out a cross-sectional descriptive study in blood donors at the Yaoundé central hospital. We recruited 200 blood donors on whose samples we performed blood grouping, screening for irregular antibodies and self-testing. Our study population consisted of 152 men and 48 women; the average age was 27.3 years. As a result, we found 4.5% alloantibodies and 0.5% autoantibodies, so an overall frequency of 5% in irregular antibodies in blood donors. This frequency of alloantibodies supports the systematisation of the Irregular Antibody Test (IAT) in blood banks.

**Keywords:** Blood transfusion, Irregular antibodies, Yaoundé Central Hospital.

### INTRODUCTION

Blood transfusion is a therapy that involves donating blood or one of its components from one or more subjects called donors to another subject called the recipient [2]. It can lead to two main types of risks: infectious risks and immunological risks. The immuno-haematological aspect of transfusion safety respects two general principles, which stipulate that: the transfused red blood cells must not provide an antigen absent in the recipient, to avoid allo-immunization and the encounter between an antigen and its specific antibody must be avoided in a recipient, to avoid antigen-antibody conflict [1]. To avoid these situations, tests such as the Detection of Irregular Antibodies (DIA) are carried out in both donors and recipients to ensure better blood compatibility. There are several types of irregular antibodies, alloantibodies and autoantibodies. Antibodies other than the regular natural antibodies of the ABO and rhesus system are irregular, so they should not be found in normal plasma [4]. In blood transfusion, these antibodies can be the cause of complications as well as when choosing the blood unit to transfuse [10]. In a study of blood donors at the central laboratory in Nairobi, Kenya, Katsutsu *et al.*, found an irregular antibody prevalence of 4% [4]. This prevalence is higher than the global prevalence range, which is 0.2-2% [3]. The scarcity of information about irregular antibodies in our country and the fact that RAI is not systematically performed in blood banks motivated us to carry out this study.

### METHODOLOGY

We carried out a cross-sectional descriptive study at the blood bank of the Yaoundé central hospital during the period from July to December 2017. Our sample was composed of blood donors received at the blood bank and those recruited during a mobile collection. They were recruited by a non-probability sampling method. To participate in the study, each blood donor had to complete an informed consent form and a questionnaire. The participant's blood were collected according to the usual procedure in a blood bag, in an EDTA tube for the immunohematological tests and in a dry tube for the infectious tests. For each sample, we performed ABO rhesus blood grouping on plate, screening for irregular antibodies in a tube and a self-test on plate. The information obtained was recorded and analyzed by the Microsoft Office EXCEL spreadsheet and by the statistical software EpiInfo 7.2.

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## RESULTS

We recruited 200 blood donors of both sexes, the average age was 27.3 years, with the extreme [18 and 57 years]. The most represented age group was that of individuals whose age was between [18 and 22 years]. The male sex was the most represented with 152 participants (76%) against 48 women (24%). The most common type of donation was replacement donation (especially family donation) representing 66.5% of donations, followed by voluntary donation from mobile collections 31% of donations and voluntary on-site donation which represented 2.5% of donations. Of the study participants, only 43 (21.5%) said they knew their blood type, but five (11.5%) of them had doubts about their group. Following analyzes, we obtained the distributions represented in the figures below.

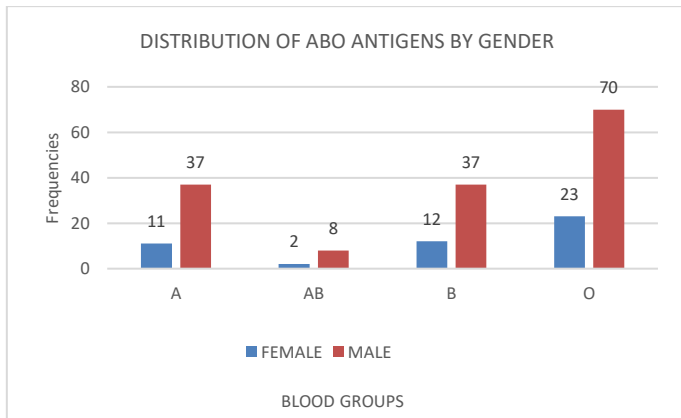


Figure 1: Distribution of ABO antigens by gender

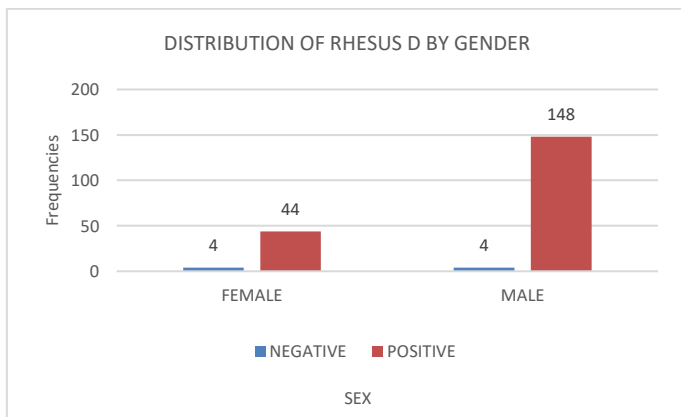


Figure 2: Distribution of Rhesus D by gender

Table 1: Distribution of irregular antibodies detected by the RAI

	%	Frequency
NEGATIVE	95.5	191
POSITIVE	4.5	9
TOTAL	100	200

From screening for irregular antibodies by the indirect Coombs technique, we obtained one female and eight positive men.

Table 2: Distribution of autoantibodies

	%	Frequency
NEGATIVE	99.50	199
POSITIVE	0.50	1
TOTAL	100	200

For auto-agglutination the only individual concerned was female

## DISCUSSION

We obtained an average age of 27.3 years, this is close to the age (26 years) found by Tayou and Mbanya in Cameroon [7] and to that (27.7 years) found by Konsam in Burkina [5]. This young average age can be justified by the youth of the population in our country. The male sex was the most represented with a percentage of 76% against 24% for the female sex, which gives a ratio of one woman to three men (1/3). This greater influx of men may be justified by the fact that there are more contraindications for donating blood in women. This result is similar to that of Tayou and Mbanya who found a ratio of between one (01) woman for three (03) to five (05) men [7]. Replacement donors were more numerous than voluntary donors, whether for mobile blood drives or on site (at the blood bank). This result is different from those of Kourouma *et al.*, and Tayou *et al.*, who had respectively found 30% of volunteers, 70% of replacement [6] and 24% of volunteers against 76% of replacement [9]. Although the results are close, this difference may be justified by the fact that these two studies did not refer to mobile blood drives. Volunteer donors were significantly represented by the fact of mobile collection. However, the number of volunteers received at the blood bank remains very low, which reveals a lack of information for voluntary blood donation. This may be justified by the ignorance of the advantages of voluntary blood donation.

The distribution of the different blood groups in the ABO system that we obtained is different from that of Tayou *et al.*, at the Yaoundé University Hospital which reported 51.3% for Group O, 24.2% for group A, 18.8% for group B and 5.7% for group AB [8]. This difference can be explained by the fact that the majority of the participants were mostly family replacement donors, with the effect of increasing blood groups similar to those of the recipients. The distribution of the Rhesus D antigen is similar to that found by Tayou *et al.*, at the Yaoundé University Hospital, which gave 96.9% to Rh D positive and 3.1% to Rh D negative [8] with the only difference that we did not have Rh D negative individuals in the AB group. This is in favor of the scarcity of individuals associating the AB group with the absence of RD (D negative). It is therefore necessary to retain the latter.

To assess irregular antibodies, we did two types of tests, the auto-agglutination test for auto-agglutinins and for allo-antibodies we did an indirect Human Antiglobulin (HAG) test. This gave an overall irregular antibody frequency of 5%. Regarding the category of irregular antibodies, the distribution is similar to that proposed by Katsutsu *et al.*, in Kenya. Their study had reported a frequency of 4% [4], on the other hand our result is in contradiction with the world trend given by the study of Kathleen which gave an interval of frequencies of 0.2 to 2% [3]. We will note that none of the positive individuals exhibited a coexistence between autoantibodies and alloantibodies.

## CONCLUSION

This study permitted to make an inventory of irregular antibodies in blood donors at the blood bank of the Yaoundé central hospital. The results show an alloantibody frequency (4.5%) higher than the global range which is between 0.2 and 2%. This should not be overlooked since alloantibodies can complicate a blood transfusion or make it ineffective. These results allow us to recommend the systematization of DIA in both donors and recipients of blood in order to improve the quality of transfusion therapy in our health facilities.

## Conflicts of interest

The authors declare no conflict of interest.

## Funding

None.

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