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Frequency Of Malaria In The Blood Groups Of The Abo Systems In The Yansi Population Of The Province Of Kwilu In The Democratic Republic Of Congo

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Abstract – This study consisted in verifying whether the blood group exerts an influence on the development of malaria in particular. The Beth-Vincent method made it possible to detect the blood group and the rhesus factor in each of the subjects in our survey using "antiserum" reagents. And to detect malaria, it was necessary to use the RDT (Rapid Diagnostic Test).
The sample selected was 272 malaria patients treated at the general referral hospital in the Niadi-Nkara health zone in the territory of Bulungu in the province of Kwilu in the Democratic Republic of Congo. The results revealed that: group O: 50.4% malaria patients; group A: 25.7% malaria patients; group B: 12.9% malaria patients; group AB: 11% malaria patients.

Keywords – Frequency, Malaria, Blood Groups, Yansi Population and DRCongo

I. INTRODUCTION

Malaria is a febrile and acute human disease, caused by the parasite of the genus Plasmodium. The most formidable species causing severe forms is *Plasmodium falciparum*. It is transmitted to humans through the bites of infected female Anopheles mosquitoes. But although deadly, it can be prevented and cured [1].

According to reference [2], almost half of the world's population is exposed to the risk of malaria, with an estimated number of deaths of 627,000 individuals per day. In the different sections of the population, certain groups are more exposed to the risk of contracting the disease and developing a severe condition than others, such as infants, children under 5 years of age, pregnant women and people living with HIV/AIDS, as well as those with low immunity who travel to areas of intense transmission (migrant workers, mobile populations and travellers).

More than half of all global malaria deaths were recorded in four African countries: Nigeria (31.9%), Democratic Republic of Congo (13.2%), United Republic of Tanzania (4.1 %) and Mozambique (3.8%) [3].

It was interesting to seek to understand why within the same population, there is a difference in contracting malaria by individuals subjected to the same environmental conditions. As part of this article a question deserves the answer to know what are the percentages of malaria in the blood groups of the system (ABO) and rhesus in the Yansi ethnic group?

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The percentages of malaria patients in the blood groups of the system (ABO) and rhesus in the Yansi ethnic group would be 50.4% of malaria patients for group O, 25.7% of malaria patients in group A, 12.9% of malaria patients for group B and 11% of malaria patients for group AB.

The general objective of this article is to determine the percentages of malaria patients in the blood groups of the ABO system in the Yansi ethnic group. The following specific objectives contributed to achieving the general objective, namely:

• To identify the blood group of each individual of the Yansi ethnic group and

• Compare the percentages of paludeens in each blood group.

The research took place during the period from April 25, 2020 to May 3, 2021, in the province of Kwilu and Maï ndombe in the Democratic Republic of Congo.

II. MATERIAL AND METHODS

2.1. Material

The biological material consists of human blood from 272 individuals suffering from malaria. The reagents used consisted of antisera for the determination of each blood group.

2. 2 Methods

To produce this article, the following methods were used :

- The documentary method which consisted in gathering the literature related to this research;
- The experimental method that took place has several stages, namely the sampling of blood from respondents using a lancet; the Beth-Vincent method for determining blood group and the RDT (rapid diagnostic test) for detecting malaria.

2.2.1 Beth-Vincent method

This method makes it possible to identify antigens as indicated in the tables below.

Table 1. Compatibility in blood transfusion of the ABO system

Type of recipient	**Acceptable blood type**			
	O	**A**	**B**	**AB**
O	Yes	No	No	No
A	Yes	Yes	No	No
B	Yes	No	Yes	No
AB	Yes	Yes	Yes	Yes

Table 2. Identification of antibodies in ABO blood system

Beth-Vincent indirect method			
Blood group	**Anti-B**	**Anti-A**	**Anti AB**
A	-	+	+
B	+	-	+
AB	+	+	+
O	-	-	-

(+) = agglutination et (-) = No agglutination

2.2.2 Data processing

Data processing was subject to the following statistical formula: $\% = \frac{ni}{n}.100$

Legende :

% = percentage ;

ni = Frequency obtained et

n = Expected frequency.

III. Results

3.1. Sociodemographic variables

3.1.1 Distribution of respondents by age and sex

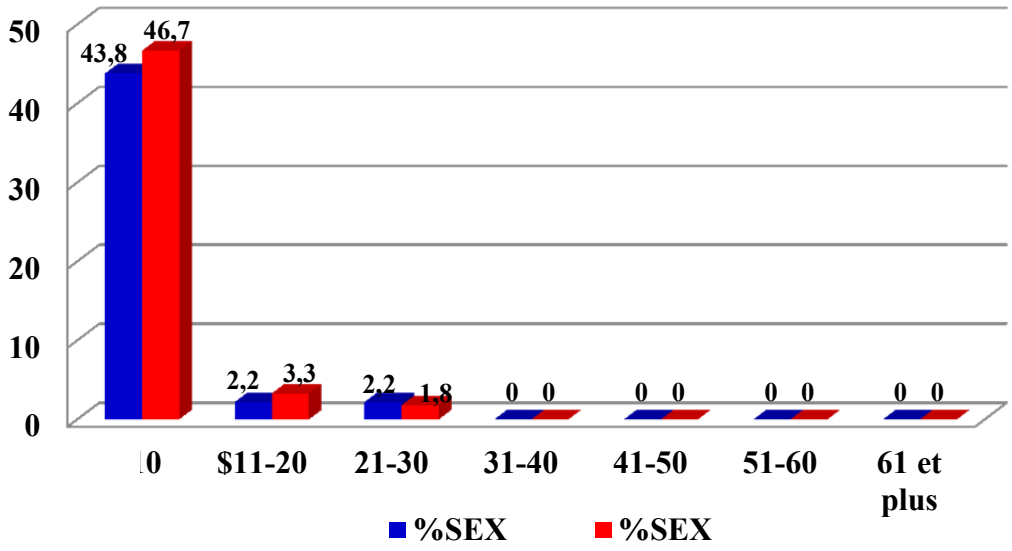

Figure 1 : Respondents of the Yansi ethnic group distributed according to age and sex.

The data in this graph indicate that 90.5% of respondents are children aged between a few months and 10 years, of which 46.7% are female and 43.8% male.

3.2. Blood group test results

Table 3. Respondent blood group results

Blood groups	Workforce	Percentages
A	70	25.7%
B	35	12.9%
AB	30	11%
O	137	50.4%
Total	272	100%

Table 3 shows that blood group O was the most represented with 137 individuals or 50.4%, followed by group A with 70 people (25.7%), 35 respondents or 12.9% and finally group AB with 30 11%.

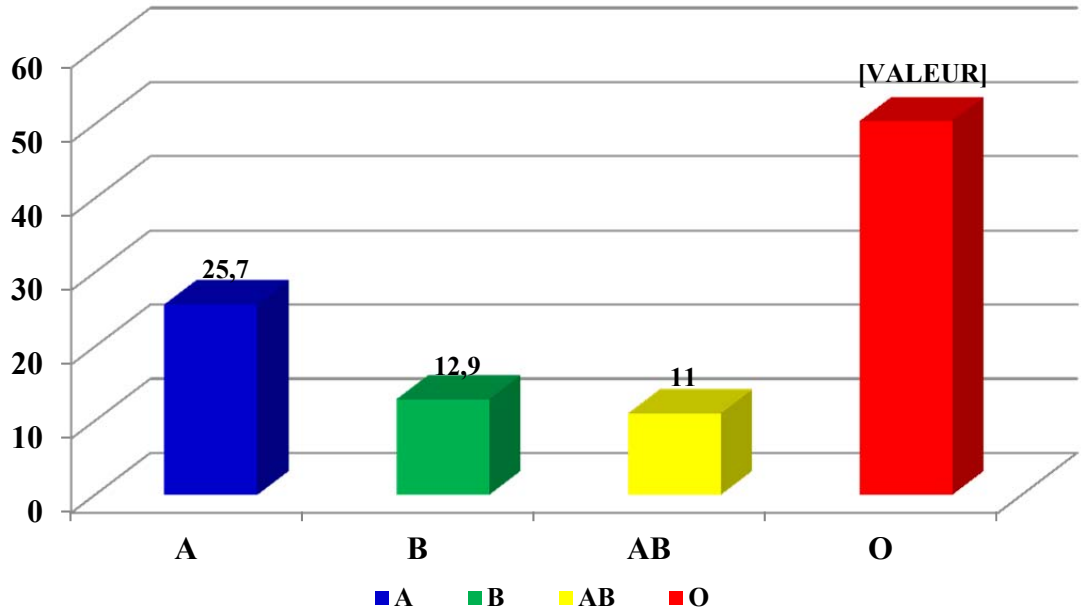

Figure 2. Percentage frequency of malaria in blood groups

3.3. Distribution of malaria in blood groups

It appears from this figure that 50.4% of malaria patients were group O, group A had 25.7% of people infected with plasmodium, 12.9% is the number of group B patients and 11% of malaria patients for group AB.

IV. Discussion

Children whose age varies from 0 to 10 years were the most parasitized by the causative agent of malaria, thus representing 90.5% and the other age groups represented 9.5%. These results are in the same direction as those of reference [4]. As for sex, there are more malaria cases in female individuals, ie 51.8% and those of male sex represented 48.2%. These results are close to [4]. In general, children and pregnant women are the most numerous people admitted to malaria care [5].

Blood group O is the most represented than the other groups. This result corroborates that of reference [6] which confirms that almost half of the population of sub-Saharan Africa would be made up of people from group O.

Although blood group O is the most parasitized in the Yansi ethnic group, this group is more resistant to disease than the others. Reference [7] provides a clear explanation with the discovery of a sticky molecule, rifin, secreted by Plasmodium falciparum. This protein, attaching to the membranes of red blood cells, would promote the aggregation of said blood cells binding to each other to create clusters that can clog blood vessels. This is what would endanger the lives of people other than those of group O.

Membrane antigens A and B would be de facto factors favoring the binding of the rifin substance on the erythrocyte membranes. On the other hand, in type O individuals whose erythrocytes lack A and B antigens, this protein would have a lesser effect on blood cells.

V. Conclusion

The results of this article on the frequency of malaria in the blood groups of the ABO systems in the Yansi population of the Kwilu province in the Democratic Republic of Congo, show that the O blood group was the most represented among the Yansi peoples of Niadi- Nkara.

It is therefore obvious that Plasmodium falciparum is identified in several individuals belonging to this blood group. We believe that the results obtained confirmed our hypothesis.

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DISCLOSURE OF CONFLICT OF INTEREST

All authors were involved in the study design, experimental design and scientific writing of the article.

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