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DISTRIBUTION OF ABO AND RH-D BLOOD GROUPS IN *ALJUFRA- LIBYA*

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***Abstract*: The study of distribution of blood group** is very important for blood banks and transfusion services that could contribute to the patients' health care. This study to Known the distribution of blood group ABO in Aljufra Libya. In addition, performed on the five main cities of Aljufra Libya namely, Waddan, Hoon, Soknah, Zilla and Alfugha. It was found that, blood group O was the most common of the ABO blood group system in the Aljufra Libya, nevertheless AB blood group was lower rare, and Rhesus D positive was more common than Rhesus D negative phenotype. The distribution of ABO blood group varies from one population to another. In a study, it was show that Blood group O was the highest, then blood group A and B finally AB.

Keywords: **Blood group, Distribution of ABO, Rhesus D, Aljufra Libya.**

I. INTRODUCTION

In 1900, The World Karl Landsteiner discovered ABO system (Hosoi, 2008), and in the 1941, later it was discovered Rhesus blood group by Landsteiner and Wiener (Rahman and Lodhi, 2004). Since1901, more than 20 distinct blood group system have been identified, but the ABO and Rhesus blood groups remain clinically the most important, (Amin, 2004). The discovery of ABO and Rh system had a significant role in blood bank and blood transfusion studies and in genetic studies of population (Enosolease, 2008). Conteras and Lubenko, (2001), and Knowles, (2002) in ABO, the blood classified according to the absence or presence of the antigen on the red blood cells into four group A , B, AB ,O the type A blood groups have A antigen and Anti-B antibodies. While type B blood group will have B antigen and Anti-A antibodies and while type AB blood group will have A and B antigen and none of both Anti A and Anti-B antibodies, type O blood group have none of A and B antigen but will have both anti-A and B antibodies show (figure1) (Hosol, 2008).

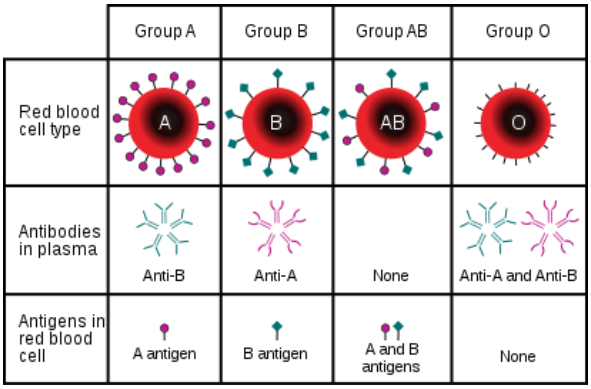

Figure 1: ABO blood group system; this figure shows the ABO blood group with the distributions of antigen in the surface of RBC and the antibodies in the plasma (Hosol, 2008).

The Rh blood group is name for the rhesus monkey. This group is determined by genes called by (D) which has two alleles D and d. Whatever other alleles a person may have anyone with genotype DD or Dd has D antigens on his or her RBCs and is classified as Rh-positive (Rh+). In Rh-negative (Rh-) people, the D antigen is lacking. The Rh blood type tested by using an anti-D reagent. ABO group,

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anti-D antibodies are not normally present in the blood (SaladinK, 2003). Through the previous studies conducted in several cities on the distribution of the ABO blood group system and Rh factors where the derives of these studies many result e. g. in Albiyda Libya is most frequent ABO blood groups were O followed by A, then B, whilst the least frequent one was AB. According to the Rh system the Rh positive more than Rh negative. (Kawakeb, 2016). However, in Hail (Saudi Arabia) is Group O was found the highest, followed by B, then A, and while the least frequent one was AB, according to the Rh system the Rh positive more than Rh negative, Ahmed *et al*., (2002) and Mohammed *et al*., (2009). Forever, in Khartoum (Sudan) is most frequent ABO blood groups were O then A then B and then AB, according to the Rh system the Rh positive more than Rh negative (Fathelrahman., (2010) and Khalil, *at al*., (1989). Furthermore, in (Nigeria) is most frequent ABO blood groups were O then A then B and then AB, according to the Rh system the Rh positive more than Rh negative (Adeyinka *et al*., 2000). And in Sikkim (India) is most frequency of blood group A was found to be the highest, followed by blood group O, then B and then AB However, to the Rh system the Rh-positive more than Rh negative, (Bisu, 2017). In addition, in Mashhad (North East of Iran). The frequency of blood group were A, then B, then AB and while the least frequent one was O, According to the system RH positive more than RH negative (Mohammab, 2005). Moreover, in Iran, Khuzestan (2015), the most frequent ABO blood groups were O, then A then B and then AB, According to the Rh system the Rh positive more than Rh negative.

II- Method and Material

Study area, Aljufra is great important and strategic location. It lies in the centre of Libya and connects the south to the north and cities to each other via a major road network near it are oil fields and not far from the artificial river system one of the most important area where it is located (Waddan, Hoon, Soknah, Al-fogha and Zilla).Where the population is about 45.117 people. It has area of about 117.410 kg2. Moreover, population density 0.38 people/kg2, (Figure 2). For the purpose to determining prevalence the ABO, blood grouping and Rh factors of municipality in terms of sex and age group. *Sample size (500)* sample of random national. *Study subject*: males and females adults Al-jufra municipality of all age category groups. ABO and Rhesus blood group typing were done by antigen antibody agglutination test by commercially available standard antisera's i.e. Anti A , Anti B and Anti D (UK Fortress). Blood groups were, determined by slide agglutination method. The blood samples were collect by finger prick with sterile lancet and after warming and cleaning the puncture site with 70% ethyl alcohol swabs. A drop of each of the antisera, anti A, anti B and anti D was added it and then mixed with each blood sample with the aid of glass rods. Blood groups were determined based on agglutination and the results of agglutination, were record immediately for each individual.

Figure 3: map shows the zone of samples collection. The study was perform on the five main cities. To Aljufra of Libya namely, Waddan, Hun, Soknah, Zilla and Al-foha.

III- Results

The prevalence of ABO and Rh blood groups in the total of 500 males and females was determined, this consisted of 154 males (31%) and 346 female (69%), as seen in (figure 3). Also was shown in this study, most frequent ABO blood groups were O (46.2%), the second blood group was A (26.8 %), and then B (21.6%) respectively, whilst the least frequent one was AB (5.4%). As shown in (figure 4 and table 1).

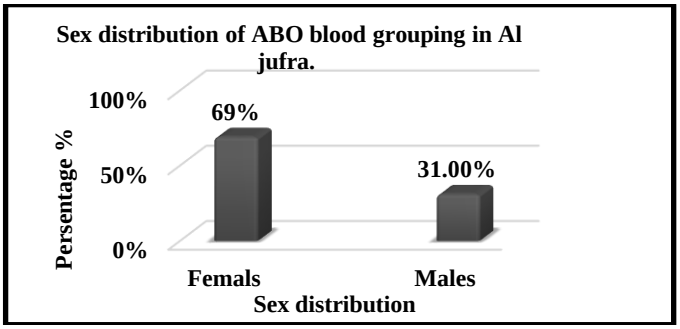

Figure 3: Sex distribution of ABO blood grouping among Aljufra-Libya blood groups in the total of 500 males and females was determined, this consisted of 154 males (31%) and 346 female (69%).

Blood Group	Number	Percentage
A	134	26.8%
B	108	21.6%
O	231	46.2%
AB	27	5.4%
Total	500	100

Table 1: Distribution of ABO blood groups in ALjufra. Most frequent ABO blood groups were O (231), the second blood group was A (134) and then B (108) respectively, whilst the least frequent one was AB (27).

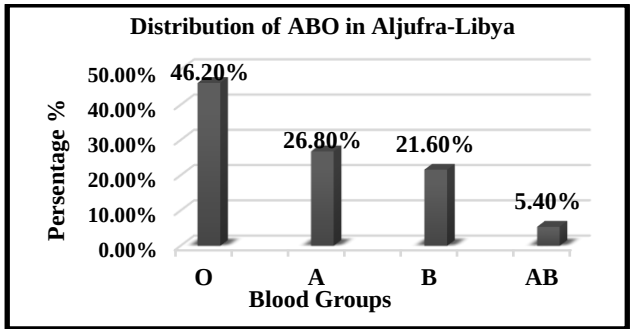

Figure 4: Distribution of ABO Blood groups in Aljfura. Most frequent ABO blood groups were O (46.2%), the second blood group was A, (26.8 %), and then B (21.6%) respectively, whilst the least frequent one was AB (5.4%).

According to the Rh system the Rh positive comprised (85.2%) and the Rh negative (14.8%) among participants as shown in figure (5). The most common type (O +) was found to be the most common species (40%), followed by groups A + (22.8%), B + (17.4%) and AB + (5%). whereas amongst the Rh negative subjects, Blood group O- was the most frequent (6.2%), followed by the groups B- and A- (4.2%), (4%) respectively, and AB-lowest frequency (0.4%), as shown in (Figure 6:).

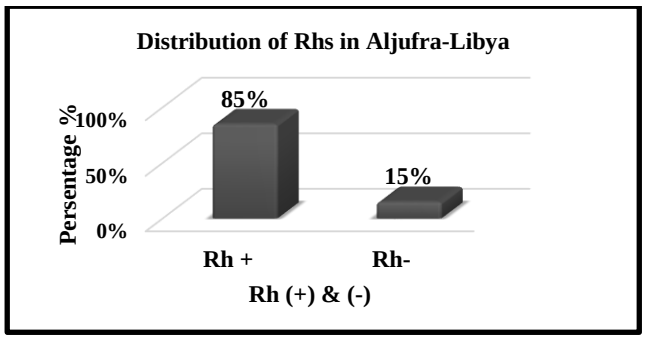

Figure 5: Distribution of (Rh) Blood Groups in Aljfura. According to the Rh system the Rh positive comprised (85.2%) and the Rh negative (14.8%) among participants as shown in figure (3).

ABO	(A)	(B)	(O)	(AB)	Total%
Rh+	22.8%	17.4%	40%	5%	85.2%
Rh-	4%	4.2%	6.2%	0.4%	14.8%
Total	26%	21.6%	24.2%	5.4%	100%

Table 1: Distribution of (Rh) blood groups in Aljufra. The most common type (O +) was found to be the most common species (40%), followed by groups A + (22.8%), B + (17.4%) and AB + (5 %).

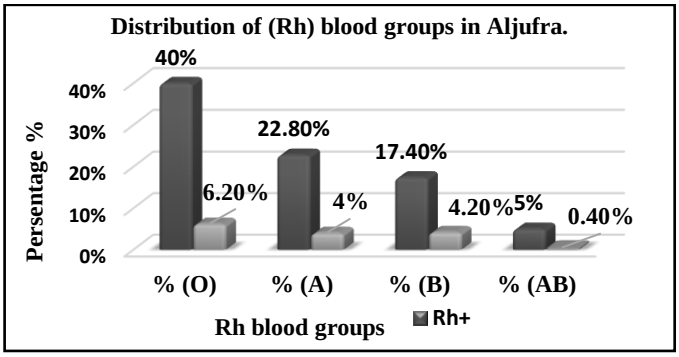

Figure 6: Distribution of ABO and Rh blood groups, the most common type (O +) was found to be the most common species (40%), followed by groups A + (22.8%), B + (17.4%) and AB + (5 %). Blood Group A + were 22.8% , A - were 4%, B + were 17.4%, B - were 4.2%, AB + were 5%, AB - were 0.4%, O + were 40% and O - were only 6.2 %.

IV- Discussion

Usually, the distribution of ABO blood group varies from one population to another. In study it was found that, blood group A + were 22.8% , A - were 4%, B + were 17.4%, B - were 4.2%, AB + were 5%, AB - were 0.4%, O + were 40% and O - were only 6.2 %. Since the distribution of blood group (O +) was the highest percentage frequency of 40%. Then least percentage frequency is that of blood group (AB-) with the lowest percentage of 0.4 % in Aljufra. Several other studies have shown that blood type (O) was the most common blood type and (AB) was the lowest blood group in other cities for instance. Such as Kawakeb, (2016) was shown in Albiyda (Libya) ABO blood group, the distribution of type O, 37.44% ; type A ,30.17%; type B,23.43%, type AB ,08.96%. In addition, in Bani Waleed, Libya was shown similar result, blood group O (43.6%) the most common, followed by A (31.7%) and then B, (17.7%) and finely AB (7.0%) (Samira, *et al.*, 2019). And also in Wadi Alshati, Libya by Ibrahim., (2017) the distribution of type O, 5.6% ; type A ,26.6 %; type B,19.4 %, type AB 3.4 %. Also in Khartoum (Sudan), found that by (Fathelrahman., (2010) and Khalil, *et al.*, (1989). the distribution is type O, 60%; type A, 21%; type B, 15%; type AB, 4. Moreover, in (Nigeria) the (Adeyinka, 2000), have seen that, type O, 49.50%; type A, 27.40%; type B, 13.70%; type AB, 3.10%. in addition, African American, the distribution is type O, 46%; type A, 27%; type B, 20%; and type AB; 7%. In Caucasians in the United State, similarity result was shown the type O, 47%; type A, 41%; type B, 9%; type AB, 3%. In Australia, also is type O, 49%; type A, 38%; type B, 10%; type AB, 3%. Moreover, in Canada, the distribution is type O, 46%; type A, 42%; type B, 9%; type AB, 3%. Also, among Western Europeans, type O, 46%; type A, 42%; type B, 9%; and type AB, 3%. %. But, in Hail in Saudi Arabia (2010), was shown the distribution was heist type of ABO was B and A then O least one AB, were shown that O,5.3%; type B 26.2%; type A; 19.2%, type AB; 3.3%This study further confirmed that Rhesus-positive has the highest percentage frequency while

Rhesus-negative has the lowest percentage frequency. In this study, it was experimental that blood group O Rhesus positive is the highest with percentage frequency of 40%, which is followed by group A Rhesus positive with percentage frequency of 22.8%, blood groups B Rhesus positive is 17.4% and AB Rhesus positive, 4.2%.

V- Conclusion

In study it was found that, blood group A + were 22.8% , A - were 4%, B + were 17.4%, B - were 4.2%, AB + were 5%, AB - were 0.4%, O + were 40% and O - were only 6.2 %. Since the distribution of blood group (O +) was the highest percentage frequency of 40%. Then least percentage frequency is that of blood group (AB-) with the lowest percentage of 0.4 % in Aljufra. Several other studies have shown that blood type (O) was the most common blood type and (AB) was the lowest blood group in other cities for instance. The conclusions of this study was, distribution of blood group O+ was the highest percentage (40%) and the least percentage frequency is that of blood group AB- with the lowest percentage of (0.4) % in Aljufra Libya**.** The result in this study similar to most other Libya city and the Arabic country.

VI- References

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