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## Blood Group Distribution in the Near East

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In this report, I shall try to give you a review of the work which has recently been carried out on the peoples living in the Near East, as this is the region on which we have done most work in the last few years in the Blood Group Reference Laboratory. Full grouping has been carried out on samples of Turks, Eti-Turks, who are Arabic-speaking people living in Turkey, Yemenite Arabs and Jews, Zabidi Arabs, and Socotrans, people living in a small island in the Indian Ocean due south of Arabia. These can all be compared with the Somalis, Africans living just across the Gulf of Aden from Arabia. I am very grateful to Dr. *Goldsmith* of the Westminster Hospital for his permission to quote his findings on the Somalis. When I refer to frequencies they must, unless otherwise stated, be understood as gene or chromosome frequencies.

Figure 1 shows A frequencies in the Near East. When we study the ABO system, we notice at once the high A frequency (about 30%) in Turkey, for the Turks and Armenians have about the highest A frequencies anywhere in



Fig. 1. A gene frequencies in the Near East.

Europe and W. Asia. As we go south the A frequency falls sharply, the peoples of Arabia having only 16 to 20%. The Socotrans and Somalis, on the other side of the Gulf of Aden, drop down to about 14% of A.

In the Near East populations it is interesting to note that the  $A_2$  frequency is uniformly high at about 6–7%, which is that found in most of Europe. Further east, in India, it falls to about 3% and in Burma to 1%, and finally it falls to zero further east still.

Figure 2 shows B frequencies. In general, in the Near East the B frequency is low. The Somalis have a lower B frequency than other African populations, and the Socotrans show both a low A, and a very low B frequency, thus having the highest O frequency in this part of the world.

Figure 3 shows O frequencies found in the Near East. The Socotrans, like many island populations, show extreme blood group frequencies, and it is a debatable question whether these are the result of peculiar conditions of natural selection, or whether they are due to “*genetic drift*”. Elsewhere in the Near East, the O frequency is generally between 70 to 75% except in Turkey, where the more typical European O frequency of about 55 to 60% is found.



Fig. 2. B gene frequencies in the Near East.



Fig. 3. O gene frequencies in the Near East.

When we study the MNS picture of the Near East we find considerable variation. The Turks again show a typical European picture, with only moderately high M frequency, about 49%, but the Eti-Turks show a higher M, 57%, and particularly a high MS frequency (31%). The Eti-Turks, therefore, in the MNS system, but not in others, show a greater resemblance to the other Arabic-speaking peoples than to the Turks, for the Arabians and also the Yemenite Jews have a much higher M, 70–75% and a higher S, 25–30%. The Socotrans, too, have a high M frequency of nearly 70%, and a particularly high S frequency (40%). Compared with this, the Somalis have a much lower M (50%) and a very low S (15%), and the Zabidi Arabs, who are regarded by many to be of Veddoid origin, stand out here by having a much lower MS frequency than their neighbours, 18% as compared to 31% in the Yemenite Arabs. This low MS frequency suggests the presence of a considerable Negroid component, and we shall discuss this again when we look at the Rh picture.

Turning finally to the Rh system, we find that the Turks and Eti-Turks give a fairly typical European picture of high  $R_1$  (49%), quite high  $R_2$  (about 17%), and about 32% of r. The Yemenite Jews and Arabs all have a much higher total frequency of  $R_0$  and  $R_0^u$  than is found in Europe, 20–25% as compared with 2%, and the Zabidi Arabs have a higher frequency still (34%). There is also a marked fall in the  $R_2$  frequencies of the Yemenite Arabs and Jews.

It is clear that the Zabidis have acquired a lot of African genes, for their very high  $R_0$ , and rather high  $R_2$ , more nearly approach the Somali figures. They also show *Sickling*, but it is an open question whether their Haemoglobin S genes represent the *Sickling gene* on its way from Asia to Africa, or whether they have been acquired solely from Africa along with their  $R_0$ .

The Socotrans on the whole give a typical Arabian picture but they have a surprisingly low  $R_0$  frequency (only 5%), and a somewhat higher  $R_2$  frequency than is found on the mainland of Arabia.

It is interesting to note that if we divide the  $R_0$  frequencies into those of true  $R_0$  and  $R_0^u$  we find great differences. The Yemenite Arabs have 15%  $R_0$  and 9%  $R_0^u$ , while the Yemenite Jews have only 1%  $R_0$ , but 20%  $R_0^u$ , which is the highest

known anywhere. The Zabidi Arabs, on the other hand have 28 %  $R_o$ , and 5 %  $R_o^u$ . The Somalis also have 5 %  $R_o^u$ , and 43 %  $R_o$ .

It is quite possible that this wide variation may be due to technical difficulties, the age of the samples when being tested possibly affecting the results. Indeed, it might even be that the Near East and African  $R_o$  differs from the European  $R_o$ . It may well be that much of the apparent  $R_o$  in the Near East is really  $R_o^u$  with a very high grade  $D^u$  which rapidly deteriorates to something indistinguishable from a low-grade  $D^u$ , so that the older the specimens, the higher appears to be the  $R_o^u$  frequency.

### *Conclusion*

The peoples of the Near East thus fall into two main classes. We have the Turks and Eti-Turks, whose relations appear to be mainly with Europe, and especially with the Mediterranean area. They have a high A gene frequency, a moderately high M gene frequency, together with a high  $R_1$ , and a fairly high rh-negative frequency.

Then we have the "Arabians", a sub-class of the "Mediterranean" race. These are the Yemenite Arabs and Jews, the Zabidi Arabs and the Socotrans and, with reservations, the Somalis. These all have low A and high O gene frequencies, mostly high  $R_1$  and rather lower rh-negative gene frequencies. They also have a very high M frequency which is possibly distinct from the general high M of Asia. It is interesting to note that the Berbers, the "white" race of N. Africa, resemble the Arabs in having a high O frequency, but differ from them in having high N and high Rh-negative frequencies.

In the second class we find African features showing up to a varying extent. There is a high  $R_o + R_o^u$ , especially in the Somalis and the Zabidi Arabs. There is a rather high N in the Somalis, and a low S in the Zabidis and Somalis.

It would be interesting if more work could be done in the Levant including Syria, Lebanon, Jordan and Israel, as findings on the inhabitants of these countries would help to bridge the gap between the two areas that I have described.