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Frequency of Clinically Important RH and Kell Blood Group Antigens Among Blood Donors in Qatar

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Background

Very limited information is available about the prevalence of blood groups among Qatari population and residents. The information about frequencies of different blood group antigens is important to manage patients who have tendency to develop alloantibodies such as thalassemics. Thalassemia is most common genetically inherited blood disorder due to a quantitative defect in hemoglobin formation, results ineffective erythropoiesis, leads to severe anemia requires regular blood transfusions. To maintain a safe blood supply for alloimmunized patients are difficult, without the knowledge of donor pool's antigen frequency evidence. We have determined the frequencies of the Rh, and Kell, clinically significant antigens among blood donors in Qatar.

Method

As per approved IRB and consent waiver signed, blood samples were collected from voluntary blood donors at Hamad Medical Cooperation (HMC), Blood Centre in EDTA vacutainer tubes. The samples were, then processed on day of collection to remove plasma and the packed RBC (pRBC) was 3 times washed with saline. After washing the pRBC were used to make 5% cell suspension with saline. Blood samples were collected from regular healthy 512 donors. Blood group antigens were analyzed by tube and Gel card method as manufacturer's instruction. The Rh antigens including, D, C, E, e and Kell (K) were typed and incidence frequencies were expressed as percentage. Anti-sera used in tube testing were bought from Lorne Laboratories, United Kingdom (UK) and the Gel cards from Grifols®. The results were analyzed by using statistical software SPSS. The data were analyzed using descriptive exploratory features to see various blood group antigens we have studied and characterized

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Results

We analyzed blood group antigens; with age range from 19–65 years, mean donors age 38.4 ± 8 years. Nationalities among donors varied considerably, the highest frequency donations were Qataris 89 (17.4%), Syrians 89 (17.4%) and Egyptians 77 (15%). When compared among Arabs 365 (72.1%) and non-Arabs 132 (25.8%), majority of blood donors are from Arab countries. Rh antigens frequency shown from our analysis is, D 88.08%, C 70.11%, E 33.59%, c 75.39%, e 88.47% and K 10.4%. The Rh antigens among Qataris were D 92.13% E 39.32%, e 88.76%, C 65.16%, c 86.5%, K 13.8%.

Conclusions

Our data shows the blood donors in state of Qatar are multinational and demonstrates variations in frequency of Rh and Kell RBC antigens. These variations may be a challenge to find antigen negative blood, needs for multiple transfused alloimmunized patients such as thalassemics and sickle cell patients. It is important to establish the incidences of various RBC antigens amid blood donors, when dealing with patients who have developed multiple antibodies. The current clinical practice in blood banks is randomly cross match the available blood units in the stock. This study will help to provide data regarding the frequency of Rh and Kell blood group clinically significant antigens. As we have mentioned very limited information are available, about blood group prevalence among Qatari population accept some data about the association of blood groups among diabetes mellitus patients in Qatar. Our study shows though there is large number of expatriates in Qatar, among them Arabs are the highest frequent blood donors including Qataris. While Indians resident community is the largest, among expatriates here in state of Qatar number of blood donation is less compare to other residents. Our data shows Qataris and Syrians 17.4% are the most regular blood donors in Qatar. The age groups highest frequent blood donors were 25–34 years in Qatar, but according to WHO facts blood donation, among high income countries most regular blood donation is in the age group 45–64 years, while low and middle income countries the age group donates most regularly are 18–25 years.