

REVIEW: RARE DONOR REGISTRY: NEED OF THE HOUR

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Abstract— A rare donor is an individual who lacks the highly prevalent antigen in the given population. Rare types can cause difficulty in blood supply in emergency situations. Patients need blood from a rare donor as they developed alloantibodies and require a more specific match than A, B, AB and O. The availability of compatible blood for patients who have developed alloantibodies remains a major challenge for Blood Transfusion Services. Now a day's various countries in the world have maintained a blood donor registry to provide rare blood type and blood negative for high-frequency antigens to the patients and are also member of the World Health Organization International Donor Panel. In India, presently there is no National rare donor registry of such donors to meet emergency situations in Blood Transfusion Services. There is an urgent need for the screening of such donors and establishment of a rare donor database at the National level which can enroll rare donor types to help patients in need of transfusion.

Key words: Rare donor, highly prevalent antigens, National Rare donor registry, transfusion services.

I. INTRODUCTION

All human Blood belongs to major groups: A, B, AB, or O and Rare Blood types are just like all other Blood types, and may not cause any problem at all unless one needs a transfusion! From blood transfusion point of view, a rare blood is the one with red cells lacking a high-frequency blood group antigen.^[1] Besides, a blood that lacks multiple common antigens may also be considered as a rare^[1] since such donor's blood may be useful for the transfusion recipient who has developed multiple antibodies to corresponding antigen. An individual's Blood type is most often considered to be rare if only one other person in 1,000 lacks the same antigens or shares the same uncommon antigens.^[2] A person's Blood type is considered as very rare if only one person in 10,000 has or lacks similar Blood antigens.^[2]

Body: Sickle Cell or Thalassemia, leukaemia patients who are regularly transfused as a part of treatment, repeatedly exposed to many different types of red blood cells are more likely to produce antibodies as compared to persons transfused once or twice in a lifetime.^[3] Red cell alloimmunization is an important risk in thalassaemia patients and 71.4% of alloantibodies are Anti-E and Anti-C type. ^[10] Sickle Cell Individuals, who produce an antibody or antibodies, are called "Responders".^[3] The incidence of "Responders" are generally only about 3% in

the general population, so most people are never going to make any antibodies and will not require anything special regarding blood transfusion even if they are found to be negative for a high-incidence antigen.^[3]

A rare donor phenotype includes high-frequency-antigen-negative or multiple-common-antigen-negative or an IgA-deficient donor (concentration less than 0.05mg/dL determined on two separate samples).^[4] Such donors need to be recognized, to overcome the most challenging situations of transfusion services, in providing antigen-negative compatible blood to patients with clinically significant antibodies against high prevalence antigens.^[5] In 1984, the ISBT Working Party on Rare Donors was formed to promote international collaboration with regards to the provision of donor blood with rare phenotypes.^[6] There are currently 118 facilities affiliated with the Rare Donor Programs across the world. The members countries included in the Working Party are Switzerland, USA, Israel, UK, Taiwan, Netherlands, South Africa, Sultanate of Oman, Germany, Japan and China.^[6]

In the Indian subcontinent there is a well-established Immunohematology Reference Laboratory at the National Institute of Immunohematology, Mumbai, under the aegis of the Indian Council of Medical Research (ICMR), Government of India, where few rare donor phenotypes have been identified. However, in most of the blood banks, the antibodies of clinical significance are either not detected by the available serological technique, or if detected, are not identified.^[8]

In Indian population the prevalence of antigens in % : D:93.6, C:87,c:58,E:20,e:98,K:3.5, k:99.97, Fy^a:87.4, Fy^b: 57.6, Jk^a: 81.5, JK^b: 67.4, M: 88.7, N: 65.4, S: 54.8 and s: 88.7. ^[9] The rare Blood types, "Bombay" (Oh) phenotype – incidence was found to be 1:7600 and 1:2500 in South-West part in Maharashtra State of India ^[10], rare -D/-D- phenotype of the Rh blood groups lacks the Rh 17 that makes it a high-frequency antigen-negative blood (4 cases) ^[11, 12], In (a+b) (1 case) ^[13], Co (a-b-) (6 cases) ^[14], weaker variants of A,B and H antigens ^[15], I-i- (1:1000) ^[16], Cde/Cde (r^yr^y)- in Parsi community^[17], Mg (2 cases) ^[18], have been encountered over a period in Indian population. The relatively rarity of these rare blood type and others can result in a shortage of that rare blood type for patients in need of a Blood transfusion.

Presently, there is a well-established American Rare Donor Program (ARDP) jointly managed by the American Red Cross and American Association of Blood Banks (AABB).^[8] The ARDP maintains a data base of donors and stock piles rare

blood supplies. The European Data Base and Bank of frozen blood of rare groups, operating under the auspices of the European Directorate for Qualities of Medicines and Health Care, operates a similar program.^[8] In the Asian region, except for Japan and China, a rare donor registry program is yet to be established.^[8] The main limiting factors which are faced by the country like India are:

1. Limited availability of resources- cost of rare antisera is very high.
2. Lack of training for technologists regarding detection and identification of antibodies of clinical significance
3. Lack of qualified man power as it is a meticulous and time consuming work
4. Lack of networking between various blood banks/blood transfusion services
5. Lack of Reference centres to detect and identify the rare phenotypes
6. Lack of awareness among the regular voluntary blood donors regarding rare blood donor
7. Ethical issues

II. CONCLUSION

It is opined that there is an urgent need to develop a centralized National database of rare blood donors which enrolls donors from Blood Banks all over the country and enlist them as 'Life Saving Blood Links' so that when a need for special blood type arises, they can be called upon to donate blood. A vast inventory of specially and extensively phenotyped blood from diverse population of donors in the country can provide help to seriously ill patients requiring transfusions in emergency situations. This in turn will contribute in saving life of hundreds or thousands of such unique and needy patients and further strengthen the Blood transfusion services within the country.

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