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Safe Blood Transfusion For Thalassemics

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The Drug and Cosmetics Act governs transfusion services in India and mandates testing for Human Immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Syphilis and Malaria on all donor units.



Thalassemia is a hereditary haemolytic anaemia characterized by the deficient synthesis of one or more globin chains in the haemoglobin. Beta thalassemia major, also called Cooley's anaemia, is a severe form. The conventional treatment for this category of patients is regular blood transfusion and chelation therapy. Repeated blood transfusion exposes these patients to a variety of risks such as transmission of infectious diseases, iron over load and alloimmunization.

It becomes the prime responsibility of the treating medical facility to offer the safest possible blood for transfusion that is free from various transfusion transmissible infections (TTI's). Although measures such as adoption of strict donor selection criteria, encouragement of voluntary non-remunerative blood donors and permanent deferral of those with high-risk behaviour as judged by the use of questionnaires are a routine practice globally, the final decision on whether or not to use a blood or blood component, entirely rests on the results of infectious marker testing reports. The Drug and Cosmetics Act governs transfusion services in India and mandates testing for Human Immunodeficiency virus (HIV), Hepatitis B virus (HBV), Hepatitis C virus (HCV), Syphilis and Malaria on all donor units.

Different centres use different screening modalities and kits that differ in their sensitivities and specificities. In spite of extensive screening protocols, none of the transfusion services across the globe can ensure 100% blood safety from any of these infectious diseases.

Although thalassemia management has drastically improved in recent years, unfortunately the services are not uniform in all the centres. Different blood banks use different screening modalities and kits that differ in their sensitivities and specificities . The advent of Individual Donor Nucleic acid Amplification Testing (ID-NAT) has narrowed down the window period of these infections considerably and we are a step closer in provision of safest possible blood. ID-NAT is a method of testing blood that is more sensitive than conventional serology tests (ELISA) that require the presence of antibodies to trigger a positive test result. In ID-NAT, Viral RNA and DNA is targeted and amplified billions of times before being detected. It significantly reduces the 'window period' or the time between donor exposure to the virus and the appearance of antibodies.

ID-NAT or Individual Donor Nucleic Acid Test assay, which was introduced in India by Hemogenomics, is based on Transcription Mediated Amplification. This technique has decreased the window period of HCV to 2.2 days, HIV to 4.7 days and HBV to 14.9 days. It can even detect viral mutants which may escape the detection otherwise.

Yet, there is a long way to go before the Government of India mandates the introduction of NAT in testing algorithms used in blood banks.

In a multicentric study, done among Thalassemics, it was shown that thirteen cases (2.8%) were positive for HBsAg by ELISA, 107 (23.1%) were reactive for anti HCV and 11 (2.38%) for anti HIV antibodies. Further screening and discriminatory assays by ID-NAT confirmed the presence of HBV DNA in 11 cases, HIV RNA in 7 cases and HCV RNA in 48 cases.It was also shown that the overall alloimmunization rate in India was 4.1% and ‘Anti-Kell’ was the most common antibody identified among the 462 thalassemics tested. In spite of economic constraints, the continuous work and efforts of the Transfusion Medicine fraternity, who are switching over to ID-NAT testing to provide the safest possible blood at their respective centres, is commendable. Patient awareness and public outcry can help drive the way further towards universal ID-NAT across all the centres in the country.

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