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Cancer Science & Pediatrics 2019: HLA matching at epitope level: an effective approach to provide platelet transfusion support in platelet refractory patients in a tertiary care oncology Centre - Anisha Navkudkar - Tata Memorial Hospital - India

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Introduction: Platelet refractoriness is the failure to achieve an acceptable increment in platelet count following platelet transfusion at least on two occasions. It is often multifactorial and is divided broadly into non-immune and immune causes. Immune platelet refractoriness primarily due to HLA alloimmunization poses a major challenge in platelet transfusion support which can be dealt with HLA matched or crossmatched platelets. Another alternative is to give platelets matched at HLA- epitope level.

Platelet transfusion refractoriness is failure to achieve desired level of platelet counts in patients following platelet transfusions. Immune platelet refractoriness remains a challenging problem in platelet transfusion therapy. Patients who are refractory as a result of HLA alloimmunization are given HLA-matched or cross matched platelets. But the HLA matched donors can be potential candidates for stem cell harvest in future and patients can develop antibodies to minor antigens causing graft rejection. Another alternative is to provide platelets from donors matched at HLAepitope level.

This is based on the concept that, HLA antibodies are produced for epitopes that can be structurally defined as eplets, which are present on different HLA alleles. We report here three patients who responded to HLA-epitope matched platelet transfusions from unrelated healthy donors. Duquesnoy antigen match grade for the three patients were B1X, D and D, respectively.

Corrected count increment (CCI) within 10-60 minutes of unmatched platelet transfusion were 1600 and 2667 in first patient; 4800 and 3200 in second patient and 1200 and 3200 in third patient on two consecutive occasions. CCI within 10-60 minutes of epitope matched platelet transfusion were 12,750; 21,000 and 12,000, respectively. Therefore, HLA epitope matching is expected to benefit platelet transfusion outcome and increase the number of compatible donors for refractory patients.

Other strategies for platelet refractoriness include use of antigen-negative platelets to avoid specific antibodies or platelets with low expression of specific antigens, such as HLA-B8, -B12, or -A25, despite HLA mismatches,13 platelet crossmatching,12 and acid-treated platelets. Specific regions of polymorphism in HLA molecules determine the nature of public and private HLA epitopes. Matching at the epitope level, based on the characterization of short sequences of amino acids from linear or discontinuous regions of the HLA molecules, may be more relevant for assessing HLA compatibility between patients and donors and the effect of donor-specific HLA antibodies. Additional advantages to this approach of epitope matching might extend to more efficient matching for highly sensitized patients and avoidance of some of the challenges of standard matching, without the need to maintain a large panel of HLA-typed apheresis donors.

Methods: The eplet version of HLA Matchmaker represents a more complete collection of HLA epitopes and provides an elaborate assessment of HLA compatibility. We report here three patients who responded to HLA-epitope matched platelet transfusions from unrelated healthy donors.

Results: Duquesnoy antigen match grade for the three patients were B1X, D and D while Panel reactive antibody (PRA) was 23%, 8% and 85% respectively. Corrected count increment (CCI) within10-60 minutes of unmatched platelet transfusion were 1600 and 2667 in first patient; 4800 and 3200 in second patient and 1200 and 3200 in third patient on two consecutive occasions. CCI within 10-60 minutes of epitope matched platelet transfusion were 12,750, 21,000 and 12,000, respectively.

Conclusion: HLA epitope matching approach in immune refractory patients can have very impressive 1-hour CCI results. It can be expected to benefit platelet transfusion outcome and increase the number of compatible donors for refractory patients.

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