

Transfusion Related Acute Lung Injury (TRALI)

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TRALI is an under-reported complication of transfusion that has developed from an almost unknown clinical entity to one of the most common cause of major transfusion-related morbidity and fatality. A clinical definition of TRALI was established in 2004, based primarily on the development of acute respiratory distress consisting of hypoxia and bilateral pulmonary oedema occurring during or within 6 hours of a transfusion in the absence of cardiac failure or intravascular volume overload. All plasma containing blood products have been implicated in TRALI and the majority of cases are associated with fresh frozen plasma, platelets and packed red blood cells. The diagnosis of TRALI relies on the exclusion of cardiogenic pulmonary oedema, volume overload and sepsis. Supportive diagnostic evidence includes identifying neutrophil or human leukocyte antibodies (HLA) in the donor or recipient plasma, and a high protein concentration in pulmonary oedema fluid. Histological findings reveal lung interstitial oedema, capillary leucostasis and neutrophil extravasation.

The pathogenesis of TRALI remains controversial. The neutrophils and the pulmonary endothelial cells are pivotal in the pathogenesis of TRALI. Leucocyte antibodies present in FFP and platelet concentrates especially from multiparous donors, and neutrophil priming agents (biolipids, CD 40L protein) released in the stored cellular blood components as well as activation of the pulmonary endothelium are considered to be causative. Multiparous female blood donors frequently have HLA antibodies with an overall prevalence of about 24%.

Treatment is supportive and ventilation is required in most patients but most do well with an associated mortality of 5-10%. Blood transfusion services have adopted several methods of reducing the risk of TRALI such the production of plasma components from male donors. The use of leucoreduced blood components, fresher blood/blood components and solvent detergent plasma may also have a benefit. It is important that medical personnel identify suspected cases of TRALI and report them to the Blood transfusion services so that steps can be taken to prevent further cases of TRALI by removing companion components of blood units that may have caused the reaction and by investigating donors involved in these cases and deferring them from

further donations if they are found to have the implicated neutrophil or human leukocyte antigen antibodies. The reporting of TRALI allows us to understand the true incidence, clinical course and associated morbidity of TRALI.

References

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