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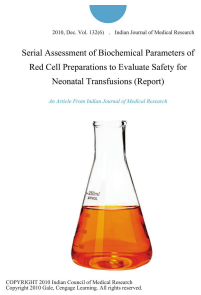
SERIAL ASSESSMENT OF BIOCHEMICAL PARAMETERS OF RED CELL PREPARATIONS TO EVALUATE SAFETY FOR NEONATAL TRANSFUSIONS REPORT EBOOKS 2019



Author: Indian Journal of Medical Research

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Red blood cells (RBC) are ideally suited to their primary function i.e., transport of oxygen from lungs to the tissues and carbon dioxide from the tissues to lungs. In neonates, RBC transfusion therapy is required in various clinical situations. During the first week of life, neonates experience a decline of RBCs caused by both physiologic factors and in sick premature infants due to sepsis, necrotizing enterocolitis or phlebotomy blood losses. Apart from this, neonates may also need to undergo surgical procedures. In most of these situations neonates usually require repeated small volume transfusions (10-15 ml/kg body weight) (1) with RBCs suspended either in citrate phosphate dextrose adenine-1 (CPDA-1) solution at a haematocrit of approximately 70 per cent or in extended storage media (additive solution) at a haematocrit of approximately 60 per cent. Large volume transfusion (25 ml/kg) are required in specific situations, e.g., exchange transfusion in hyperbilirubinaemia; exchange transfusion for sepsis, extracorporeal membrane oxygenation (ECMO) and cardiac bypass surgery for congenital heart disease (2,3). Many controversies exist regarding neonatal transfusion practice. Neonatologists often insist on transfusion of fresh RBC (7 days old) because of various concerns regarding stored RBCs. There is an increase in extracellular potassium ([K.sup.+]), decrease in pH and 2,3 diphosphoglycerate (2,3 DPG) in stored blood which is important for oxygen release in the tissues. There is also a possible risk of use of compounds like mannitol and glucose, in relatively large amounts, which are present in RBC additive solutions. However, when neonates require repeated transfusions, requisitions for fresh blood may lead to multiple allogeneic blood donor exposure and its consequent risks. Certain in vitro studies have revealed that alterations in various biochemical parameters on storage of whole blood/RBC do not significantly affect neonatal homeostasis after small volume or top-up transfusions (4,5). These observations may help in reducing multiple donor exposures in neonates who require repeated small volume transfusions. One donor unit could be dedicated for one neonate after aliquotting it into small volumes (6).

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