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Placental umbilical cord whole blood transfusion to combat anemia in the background of severe malaria

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Malaria is a lethal endemic disease, causing over million deaths annually. The destruction of erythrocytes by *P. falciparum* and thrombocytopenia by *P. vivax* causes anemia, major co-morbidity. Adverse effects are more prominent in children and pregnant women. The available treatments for anemia are transfusion of freshly collected RBC, erythropoietin injection, blood substitutes and dietary supplementation of hematinic. The major challenge is the unavailability of safe screened blood in the developing and under developed countries, for immediate transfusion to the patient. Cord blood contains CD34+ cells, fetal hemoglobin 60%-80% (oxygen carrying capacity is 60% more than the adult hemoglobin), higher platelet and WBC content, hypo-antigenic with altered metabolic profile, anti-malarial effect. The cytokines and growth factors of the cord blood have stimulatory effect on bone marrow. The institutional ethical committee approved the study, for which 94 units of cord blood obtained from healthy consenting mothers via LUCS. The collected volume of cord blood/placenta varied 52 ml to 143 ml mean packed cell volume 48.9 ± 4.1 SD and mean hemoglobin concentration $16.4 \text{ g} \pm 1.6 \text{ g} \%$ SD. Cord blood was screened and transfused to 39 consenting randomly selected patients suffering from confirmed malaria (varying between the age of 8 years to 72 years) with hemoglobin less than 8 g% (pre-transfusion hemoglobin varied between 5.4 g/dl to 7.4 g/dl), according to standard blood transfusion protocol (screened, cross matched between donor and recipient). Rise in hemoglobin after 72 hours of transfusion was (0.5 g/dl-1.6 g/dl). On 7th day, statistically significant ($p < 0.003$) rise in hemoglobin was observed, also peripheral CD34+ cells increased. No detectable rise in glucose, serum creatinine, urea or bilirubin was observed. No immunological or non-immunological adverse reaction was observed. Cord blood is an under-utilized, potentially advantageous substitute for adult blood transfusion in cases of severe anemia.

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