

# **Change in Haemoglobin Concentration of Children with Severe Anaemia at Mulago Hospital: A prospective study**

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## ABSTRACT

**Back ground:** Severe anaemia requiring blood transfusion is a major cause of morbidity and mortality among African children. Blood transfusion increases the haemoglobin concentration of severely anaemic children during hospitalisation. However, what happens to these children after discharge from hospital is poorly described. The change in haemoglobin concentration and the factors associated with adequate recovery from severe anaemia among children managed at Mulago Hospital have hitherto not been documented.

**Objectives:** To describe change in haemoglobin concentration of children with severe anaemia within 24 hours of blood transfusion and at 6 weeks after discharge from hospital.

Secondarily, to describe factors associated with adequate haematological recovery from severe anaemia among children at 6 weeks after discharge from Mulago Hospital.

**Methods:** A total of 188 children aged 6 to 60 months admitted at the ACU with severe anaemia who fulfilled the inclusion criteria were enrolled into this prospective, cohort study. Pre transfusion Hb, post transfusion Hb and Hb at 6 weeks after discharge were measured.

**Analysis:** Mean change in Hb was compared using the paired t test while linear regression was used to compute the increase in Hb by volume of blood transfused. Logistic regression was used to analyse for associations with adequate haematological recovery.

**Results:** The male to female ratio was 1:1. Median age was 24 (IQR 13.6, 36) months. The mean change in haemoglobin concentration within 24 hours of blood transfusion and at 6 weeks after discharge from hospital was 2.6g/dL (SD 1.5) and 7.2g/dL (SD 2.2) respectively. The increase in haemoglobin concentration per 10mL/kg of packed red cells was 1.5g/dL following blood transfusion. The proportion of children with adequate haematological recovery was 62%. Age  $\geq 24$  months was associated with adequate haematological recovery OR 4.9 (95% CI 1.8, 13,  $p=0.03$ ), while malaria infection during post discharge period reduced the chances of recovery by 70%. OR 0.3 (95% 0.12, 0.87,  $p=0.026$ ).

**Conclusions:** The increase in haemoglobin concentration per 10mL/kg of packed red cells falls below the recommended World Health Organisation estimates.

The proportion of children with adequate haematological recovery was higher than previously reported.

A child older than 24 months is 5 times more likely to recover adequately from severe anaemia compared to one less than 24 months of age.

A child who suffers from an episode of malaria in the post discharge period is 2 times less likely to attain adequate haematological recovery 6 weeks after discharge from hospital.

**Recommendations:** A study comparing blood transfusion practices using higher volumes of blood with the standard volumes should be done.

Interventions to prevent the occurrence of malaria in the weeks following admission for severe anaemia specifically among children less than 24 months of age should be strengthened.

A study to assess the effect of post discharge malarial chemoprophylaxis on haematological recovery of children with severe anaemia should be done.