

**EFFECT OF BLOOD STORAGE AGE ON THE
RESOLUTION OF LACTIC ACIDOSIS IN CHILDREN
WITH SEVERE MALARIAL ANEMIA AT MULAGO
HOSPITAL.**

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**A dissertation submitted in partial fulfilment of the requirements for the award of a
Masters of Medicine Degree in Paediatrics and Child Health of Makerere University.**

(2012)

ABSTRACT

Background: Severe malarial anaemia requiring blood transfusion is a life threatening condition affecting millions of children in Sub-Saharan Africa. Up to 40% of children with severe malarial anemia have associated lactic acidosis. Lactic acidosis has been cited as a frequent feature among fatal cases of malaria, occurring in 75% of the case fatalities. A pilot study has shown that among children with severe malaria, blood transfusion in addition to treating severe anemia, also corrects fatal lactic acidosis. Among other factors, it is not known whether the storage age of blood for transfusion affects resolution of lactic acidosis.

Objectives: To evaluate the effect of blood storage age on resolution of lactic acidosis in children with severe malarial anemia.

Methods: Children aged 6 – 59 months admitted to ACU with severe malarial anemia (Hb <5g/dl) and lactic acidosis (blood lactate >5 mmol /l), were randomly assigned to receive either blood of shorter storage age (1-10 days) or longer storage age (21 -35 days) by gravity infusion as is the routine practice. Thirty seven patients were enrolled in each study arm. Physiological measurements namely; blood lactate, trans-cutaneous oxygen saturation, hemoglobin, blood pressure, respiratory rate and pulse rate were taken at baseline, during and after transfusion. The two groups were compared. The primary outcome variable was the proportion of children whose lactic acidosis resolved by four hours after transfusion (counted from the start of transfusion). Twenty four hour mortality was recorded as the secondary outcome.

Results: Thirty four out of thirty seven (92%) of the children in the short storage treatment arm compared to thirty out of thirty seven (81%) in the long storage arm had their lactic acidosis resolved by 4hrs post transfusion (p value = 0.308). The mean time to lactic acidosis resolution was 2.65hrs (95% CI; 2.25 – 3.05) in the short storage arm, compared to 3.35hrs (95% CI; 2.60 – 4.10) in the long storage arm (p-value = 0.264). Mortality was one out of thirty seven children in the short storage study arm and none out of the thirty seven in the long storage arm (p-value = 0.999).

Conclusion: Among children with severe malarial anemia and lactic acidosis transfused with packed red blood cells, the storage age of blood does not affect resolution of lactic acidosis.

Recommendations: Until a larger study is carried out, children with severe malarial anemia and lactic acidosis requiring blood transfusion should be transfused with red blood cells of any storage age; one to thirty five days as is the current practice in Uganda. A larger and well powered study on this subject is recommended.