Paediatric Anaemia at Kamuzu Central Hospital

EAS Nelson, S Kelleher, D Buckley

This retrospective study assessed the outcome of children admitted during a six week period to Kamuzu Central Hospital (KCH) with anaemia. 19% of admissions had a primary discharge diagnosis of anaemia and there was a 12% mortality. Children who died were more likely than those who did not to have other diagnoses that may have contributed to mortality. 72% had a diagnosis that included both anaemia and malaria, but malaria was only documented in 36%. Malaria may be over-diagnosed in that 57% of cases with a diagnosis that included malaria had negative blood smears for malaria. More data is required to determine whether delays in obtaining blood for transfusion influence mortality.

Introduction

Admissions from malaria and anaemia peak towards the end of the rainy season (March to May). In recent years, anaemia has been a leading cause of childhood mortality in Malawi. The treatment of severe anaemia is blood transfusion, but the HIV epidemic has had a major impact on the availability of blood for transfusion. Blood donors are less prepared to come forward and as a result the blood banks often have to rely mainly on the patient's relatives as donors. Once donated, this blood has to be screened for HIV. The current screening method at KCH takes at least an hour and the method is designed to test simultaneously a large batch of specimens rather than individual urgent specimens. It is thus not uncommon to see children die of severe anaemia while awaiting the arrival of either a relative to donate blood or for the donated blood to be screened. On occasion blood remaining from transfusions of other children can be used in the emergency situation. Alternatively the medical staff can authorise the administration of unscreened blood.

Kamuzu Central Hospital, Lilongwe
Nelson EAS, Kelleher S, Buckley D

Correspondence to:
Dr. E.A.S. Nelson
Paediatrician
Kamuzu Central Hospital
P.O. Box 149
Lilongwe

Methods

This retrospective study aimed to look at the outcome and treatment of children admitted with anaemia during the peak season for such admissions. Notes of children admitted to the children's ward of KCH from the 1st April 1990 to the 15th May 1990 with a diagnosis of anaemia were reviewed. Notes were selected if two or more of the following criteria were present: haemoglobin less than 9 gm/dl; anaemia recorded in the admission or discharge diagnosis; request for blood to be crossed-matched or a blood transfusion given. Haemoglobin results were taken from the notes, the laboratory forms or the referral note.

The following information was then abstracted from these selected notes: presenting complaints, whether referred, admission and discharge diagnoses, admission and discharge dates, age, weight, sex, haemoglobin, MCV, MCHC, malaria blood film, date and time of blood transfusion, treatment given for anaemia and malaria and final outcome.

A total of 1213 notes were located for this period and 23% (278/1213) fitted the criteria outlined for anaemia. Analysis relates to this sample defined as anaemic (n=278). Data was analyzed using Epiinfo 5 (CDC, Atlanta).

Results

The mean age of the sample was 17.8 months (range 2 months to 13 years). The mean weight-for-age was 74% using the upper line of the under-five card to equal 100% of expected weight-for-age. Eighteen percent of the sample were marasmic (less than 60% weight-for-age) and 69% were less than 80% weight-for-age (underweight or marasmic). The mean weight-for-age was 69% for deaths and 74% for others ($F=4.6$, $p=.03$).

84% (233/278) had a primary discharge diagnosis of anaemia i.e. would appear in the official statistics as being anaemic. 42% (118/278) of the sample were referred to KCH. Significantly more

of the referred group (80/118) compared to the non-referred group (88/160) were transfused (X^2=4.1, p .04). 60% (168/278) of the sample were transfused and blood cross-match was requested in a further 25% (68/278). 29% (48/168) of transfusions occurred on the day of admission, 39% (65/168) on the day after admission, and 17% (28/168) two days after admission.

31% (11/35) of abscondees were transfused, 32% (13/41) of deaths were transfused and 71% (144/202) of those discharged home were transfused (X^2=36.4, p.0001). The mean hospital stay was 4.3 days (3.5 for those who absconded; 3.9 days for those who died; and 4.5 days for those who went home).

15% (41/278) of the sample died with 61% (25/41) of deaths occurring within one day of admission. Seven deaths occurred a week after admission and six of these had another diagnosis other than anaemia that was likely to have been responsible for the death. Overall 46% (19/41) of the deaths had another diagnosis other than anaemia that may have been responsible for the death (pneumonia = 11, malnutrition = 4, measles = 3, tuberculosis = 1). Only 20% (48/237) of the non-deaths had another significant diagnosis other than anaemia (X^2=11.6, p .001).

Haemoglobin results were available for only 61% (170/278). The mean haemoglobin was 5.0 gm/dl (range 2 gm/dl to 9 gm/dl) and 62% of haemoglobin levels were less than 5.0 gm/dl. Haemoglobin results were available for only 15 of the deaths and nine of these values were 5 gm/dl or more.

72% had a discharge diagnosis that included both anaemia and malaria. Malaria smears were positive in 36%; not done in 11%; done but no result in 40% and negative in 13%. 90% received some treatment for malaria. 57% (21/37) of those with a negative malaria smear had a discharge diagnosis that included malaria.

Other treatments given are shown in the Table.

Table Treatments given to 278 children with anaemia

Treatment	Total (n=278)	Transfused (n=168)	Not transfused (n=110)	p
Iron	86%	89%	83%	.21
Folic acid	36%	40%	31%	.16
IV quinine	11%	10%	12%	.80
Oral quinine	32%	32%	32%	.94
Chloroquine	51%	55%	45%	.16
Other antimalarial*	55%	60%	46%	.03
Frusemide	37%	45%	25%	.001
O_2	19%	20%	17%	.74

* Amodiaquine and Fansidar

Discussion

The results of this study show that 23% of admissions during a six week period (1st April to 15th May 1990) were anaemic on the basis of two of the following three criteria: admission or discharge diagnosis that included anaemia; received a blood transfusion; haemoglobin of less 9 gm/dl. However based solely on a primary discharge diagnosis of anaemia, 19% of the admissions would have been classified as anaemic on official statistics. Despite the study being carried out during July 1990 up to 18% of case notes could not be located. Some of these patients may have been long stay patients still on the ward and this might have biased the results. 15% of the sample (i.e. fulfilling the criteria for anaemia) died but on closer scrutiny it would appear that approximately half of these deaths may have been caused by a condition other than anaemia.

Results from 40% of malaria smears requested did not reach the notes and therefore could not influence management. The discharge diagnosis included malaria in 72%, yet positive smears were only documented in 36%. Further, 57% of those with negative smears still had a discharge diagnosis that included malaria. This would suggest that official statistics may over-estimate the prevalence of malaria in the hospital population. Also what is not clear is how the primary diagnosis is recorded when both anaemia and malaria are listed (72% in this sample). Presumably if the discharging doctor writes anaemia and malaria then the official discharge diagnosis is anaemia whereas if the doctor writes malaria and anaemia then malaria is the diagnosis.

From the available data it is impossible to say how many deaths were the result of delays in obtaining blood. Although 32% of "deaths" were transfused this was significantly less than the 71% of "discharges" who were transfused. A more detailed prospective study is required to answer this question.

Acknowledgement

The authors wish to thank Mr. Mangulama for helping to locate case notes.