

Prevalence of anaemia among children under five years in tertiary care hospital of Nepal.

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ABSTRACT

Introduction: Anaemia is a pathologic deficiency in oxygen-carrying haemoglobin in red blood cells which may be the result of genetic diseases, infections and deficiency of several nutrients. Nepal is one of the developing countries where anaemia is one of the most serious public health problems. So, a study was planned to evaluate the prevalence of anaemia among children under five years in tertiary care hospital of Nepal.

Methods: A cross-sectional study was carried out from August 2011 to January 2012 using a structured questionnaire interview and observation. The children were divided into three groups: group I (0-1 years), group II (>1-3 years), group III (>3-5 years). Anaemia was assessed using haemoglobin measurement in gram in decilitre on Sysmex KX -21 (automated haematology analyzer). The severity of anaemia were grouped as follows: severe anaemia, < 7.0 g/dL; moderate anaemia, 7.0 to 8.9 g/dL; and mild anaemia, 9.0 to 10.9 g/dL as per WHO classification. Stool test was also carried out to assess worm infestation. Data were analysed using SPSS 11.5.

Results: There were 208 children among which 52.9 % were male while 47.10 % were female. The overall prevalence of anaemia was found to be 49.5% of which 43.3% had mild, 15.8% had moderate and 0.5% had severe anaemia. Out of 20 children in group I, 70 % were anaemic. Among the 94 each in group II and group III, children suffering from anaemia were 51% and 43% respectively. The stool investigations showed that 5.3 % children suffered from worm infestations.

Conclusions: prevalence of anaemia was seen in 49.5% of children below five years age group and the diet and worm infestations didn't affect it.

Keywords: anaemia; children under five years of age; haemoglobin; prevalence.

INTRODUCTION

Anaemia is a pathologic deficiency in oxygen-carrying haemoglobin in red blood cells. It is one of the micronutrient deficiencies that affect under-five children of developed and developing nations.¹ Other common causes of anaemia apart from iron deficiency include chronic infections, particularly malaria, hereditary haemoglobinopathies, and folic

acid deficiency.² Nevertheless, endemic anaemia during childhood is believed to result from a combination of exceptionally high demands of iron required for child growth and iron-poor diets especially those deficient in highly bioavailable iron.³ The children with Iron deficiency anaemia are seem to have delayed psychomotor development, and when they reach school age they have impaired performance in tests of language skills, motor skills, and coordination, equivalent to a 5

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to 10 point deficit in Intelligence Quotient (IQ).⁴

The Nepal Micronutrient Status Survey revealed that nearly 67% of women and 78% of children under five years were anaemic. The epidemiology of anaemia varies substantially between different ecological and socio-cultural settings.⁵ There are few studies regarding prevalence of anaemia in Nepal.

So, this present study with the aim to evaluate the prevalence of anemia was planned among children under five years attending Paediatric OPD in Shree Birendra Hospital, Chhauni, a tertiary care hospital of Nepal.

METHODS

This was a descriptive type of cross-sectional study conducted in the Paediatric outpatient department of Shree Birendra Hospital, Kathmandu. Simple random sampling technique was followed for the selection of the 218 children. They were divided into three groups: group I (0-1 years), group II (>1-3 years), group III (>3-5 years). Children who were critically ill, having malaria, congenital hereditary defects in haemoglobin synthesis; haemorrhage in child birth, trauma and taking any medication that could cause haemolysis / anaemia were excluded from the study. The study was conducted using a structured questionnaire interview, observation, anthropometric measurement, blood test, and stool test. Structured questionnaire covered demographic data including age, sex; and socioeconomic indicators including the mother's educational status, size of the household etc. Haemoglobin levels were measured for all children under five years who were included in the study. Blood samples were drawn by professional laboratory staff after written consent from their parents. Anaemia was assessed using Sysmex KX -21 (automated haematology analyzer). The haemoglobin was measured in gram per decilitre for evaluation of anaemia. Levels of anaemia were grouped as follows: severe anaemia, < 7.0 g/dL; moderate anaemia, 7.0 to

8.9 g/dL; and mild anaemia, 9.0 to 10.9 g/dL.⁶ The stool sample was collected for the microscopic evaluation of helmenthiasis mainly hook worm. The collected data were both qualitative and quantitative. SPSS version 11.5 was used for recording the data.

RESULTS

Among the 218 studied children, 52.9 % were male. Children under 1 year were only 9.6%, 94 children (45.2%) were each under 1- 5 years. The mean age of the participant children was 33.78 months with standard deviation of 14.55. The minimum age of the participant was 3 months and maximum age was 59 months.

Non-vegetarian food habit was mostly followed by 80.8% children. Out of 20 children in group I, 70 % were anaemic. Among the 94 each in group II and group III, children suffering from anaemia were 51% and 43% respectively.

The prevalence of anaemia was found to be 49.52% of which 43.27% had mild anaemia, 5.77% had moderate anaemia and 0.48% had severe anaemia. The haemoglobin level showed normal in 50.48% children (Table 1).

Table 1. Types of Anaemia

S. No.	Types of anaemia	Number	Percentage
	Normal	105	50.48%
	Mild anaemia	90	43.27%
	Moderate anaemia	12	5.77%
	Severe anaemia	1	0.48%
	Total	208	100%

The anaemia in children under five years whose mothers had taken iron supplement during her pregnancy have less prevalence i.e. 45.5% whereas prevalence of anaemia is high (75%) in children under five years whose mother did not take iron supplements (Table 2).

Table 2. Correlation of iron supplement during pregnancy and anaemia

Iron supplement during pregnancy	ANAEMIA					Overall Total
	Normal Hb	mild anaemia	moderate anaemia	severe anaemia	Total (anaemia)	
yes	103 (54.5%)	85	11	1	97 (45.5%)	200 (100%)
no	2 (25%)	5	1	0	6 (75%)	8 (100%)

The stool investigations showed that 5.3 % children suffered from worm infestations. Hookworm and roundworm was seen in one and four children respectively (Figure 1).

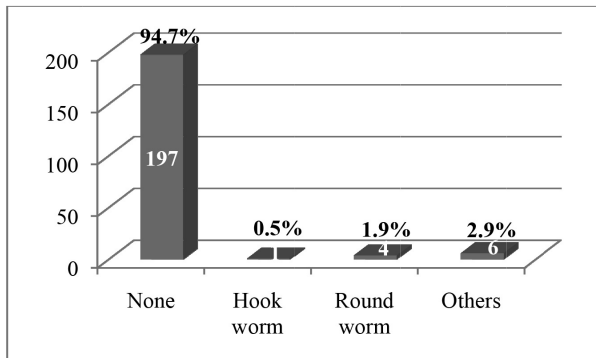


Figure 1. Frequency of Intestinal helminthes

DISCUSSION

Anaemia is one of the micronutrient deficiencies that may cause retardation of child development, compromised cellular immunity, reduce intellectual capacity and delayed psychomotor development. Childhood anaemia is treatable and preventable. Unfortunately, the resource-limited regions of the world bear the greatest burden of anaemia. Almost half (48 %) of Nepalese children 6-59 months old are anaemic, with 26 % mildly anaemic, 22 % moderately anaemic, and less than 1 % severely anaemic.⁷ Similarly, this study showed 49.52% of the children under five years to be anaemic out of which 43.27% mild, 5.77% moderate and 0.48% had severe anaemia. The haemoglobin level showed normal in 50.48% children.

While these rates are high, they represent a significant decrease since the 1998 Nepal Micronutrient Survey, which indicated that 78 % of children 6-59 months were anaemic.⁸ In contrast to our study, Siegel et al, 2006 had found 77% prevalence of anaemia (11g/dl) in their studied population.⁵

Much iron is lost through parasitic infestation. The best way to avoid getting intestinal parasites is to wash hands frequently and always after using the toilet and before eating food, using soap and clean water. In our study, even though only 60.6% of the children had taken deworming medicine in the last six months, 94.7 % children didn't suffer from any worm infestations. The

association between anaemia and worm infestations is not seen as in study by Heckman J et al.⁹

In contrast to this study where 96.6% of the children had access to proper toilet facilities, only 8% of families had a household latrine in a study done in Sarlahi district in south central Nepal.⁵ In this study, it was seen that maximum children (98.6%) had the habit of washing their hands with soap and water after using toilet and before eating, enabling them safe in contacting intestinal parasites. This may be due to increased awareness about health and hygiene among the parents.

CONCLUSIONS

Anaemia is observed in 49.5% of children under five years in the Paediatric OPD of one of the tertiary care hospitals of Nepal and worm infestation was not a major problem as expected, which was probably due to better hygiene awareness.

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