

Study of anaemia in pregnancy and its outcome in Nepal Medical College Teaching Hospital, Kathmandu, Nepal

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ABSTRACT

Anaemia is the commonest problem in pregnancy in developing countries. It is defined by WHO as haemoglobin level less than 11 grams % in pregnancy. It is divided in to three degree mild degree(9.0-10.9gm%), moderate degree(7.0-8.9 gm%) and severe degree(<7.0gm%). It carries a lot of threats to the mother as well as baby. This is a hospital based retrospective study done in Nepal medical college ,teaching hospital (NMCTH) of Nepal among the women who came for regular antenatal check up and delivered in the same hospital as well. Total of 863 cases were recorded as complete record out of which 368 were anaemic and 495 were nonanaemic. The prevalence of anaemia was 42.6%. The birth weight, Apgar score at the time of birth, prevalence of preterm delivery and IUFD were more common in anaemic group than in nonanaemic group.

Keywords: Anaemia, IUFD, hook worm, pregnancy, Nepal.

INTRODUCTION

It has long been recognized that anaemia is a major public health problem especially among poorer segments of the population in developing countries.¹ Anaemia is one of the most prevalent nutritional deficiency problems affecting pregnant women, defined by the WHO as haemoglobin levels of less than 11 gm %.¹⁻⁴ Haemoglobin level of 9.0-10.9 gm% is mild anaemia, 7.0-8.9 gm% is moderate anaemia and less than 7 gm% is called severe Anaemia.⁵ Maternal anaemia in pregnancy is commonly considered a risk factor for poor pregnancy outcome and can result in complications that threaten the life of both mother and fetus. Current knowledge indicates that iron deficiency in pregnancy is a risk factor for preterm delivery subsequent low birth weight and possible inferior neonatal health.⁶ However, the extent to which maternal anaemia affects maternal and neonatal health is still uncertain. Some studies have demonstrated a strong association between low haemoglobin before delivery and adverse outcomes while others have not found a significant association.

The prevalence of anaemia in pregnancy varies considerably because of differences in socioeconomic conditions, lifestyles and health-seeking behaviours across different cultures. Many researches in different parts of developing countries have documented iron deficiency as the leading cause of anaemia in pregnancy.^{3,6}

Anemia in pregnancy is considered one of the major risk factors contributing to maternal deaths in developing countries.⁶ Hemorrhage, eclampsia and infections being the three major causes of maternal deaths in Nepal.⁷ Since it reduces resistance to blood loss, death may occur from bleeding associated even with normal delivery. Association of anemia with adverse maternal outcome such as puerperal sepsis, antepartum haemorrhage, postpartum haemorrhage and maternal mortality is no longer a debatable issue.⁸ That is why early diagnosis and treatment of anemia is very important in pregnant women.

There are many studies on anemia in pregnancy in Nepal. Bonevik⁹ showed prevalence of anaemia 62.2% out of which 3.6% with severe anaemia in a study done in Kathmandu, Nepal. Similarly high prevalence (50.0%-60.0%)¹⁰ of anaemia were noted in various studies particularly important study carried out by Shah and Gupta¹¹ showed that prevalence of anemia in adolescent girls in Dharan, a town in eastern region of the country was 68.8%. Association of anaemia with malaria and hookworm infestations has been seen earlier in various studies done across the globe.¹²⁻¹⁵ A study in Egypt found *Fasciola* infection among children to be significantly associated with low levels of haemoglobin ($p < 0.0001$).¹⁶ Another study in Niger found a significant correlation between anaemia and *Schistosoma haematobium* proving that helminthic infestations are a cause of significant morbidity directly related to anaemia.^{17,36,37}

A study done by Hawdon and Hotez showed that hookworms cause severe anemia and malnutrition in developing countries of the tropics, with an estimated one billion people infected worldwide.¹⁵ WHO has emphasized the need of epidemiological studies where up-to-date information is not available.¹⁸

During pregnancy, the needs of the growing fetus and placenta, as well as the increasing maternal blood volume and red cell mass, impose such a demand on maternal iron stores that iron supplementation at daily doses between 18 and 100 mg from 16 weeks gestation onwards could not completely prevent the depletion of maternal iron stores at term (Thomsen 1993 <http://humrep.oxfordjournals.org/cgi/content/full/15/8/1843> - THOMSEN-ETAL-1993 <http://humrep.oxfordjournals.org/cgi/content/full/15/8/1843> - MILMAN-ETAL-1994).¹⁹ The development of iron deficiency anaemia is associated with increased risk of preterm births and low birth weight infants. Various studies have been conducted to understand how anaemia predisposes to preterm labour either directly or indirectly

due to increase risk of infection.²⁰ Direct effect is due to hypoxia induced by anaemia which induces synthesis of corticotrophin-releasing hormone (CRH) associated with stress predispose to preterm labour and even pregnancy induced hypertension.²¹ It is also said that increase level of CRH in mother stimulates increase production of cortisol in fetus which in turn inhibits the longitudinal growth of the fetus.²² Another indirect mechanism is iron deficiency leads to oxidative damage to erythrocytes in the fetoplacental unit which stimulates production of CRH and both in vivo and in vitro.^{22,23}

PATIENTS AND METHODS

This study was conducted in Nepal Medical College Teaching Hospital (NMCTH). It was established in 1996 with aim to serve Nepalese people. It is located in the eastern part of the Capital which is inhabited mainly with lower and middle class people and is recognized as an area with lots of carpet factories. It is about half an hour drive from the downtown

Permission from the head of Department was taken. In this study, the effort has been done to include all the patients who had come to NMCTH for Antenatal care and delivered in NMCTH as well. Not all patients who are coming for antenatal care come for delivery and not all deliveries in NMCTH have regular Antenatal care in NMCTH, so we included only those who came to NMC for antenatal check up and came for delivery as well. Since the establishment of this hospital, we tried to maintain antenatal card which we keep in Hospital for records. During the early days because of some technical reason it was not be properly done but we tried to maintain it as much as possible. All the women who come for antenatal check up in NMCTH, routine investigations are sent in the very first visit. For this study we went through all the records which includes from first visit, all events, all investigations and delivery note with baby outcome. Records with incomplete information are excluded from the study. So this is a retrospective study conducted in NMCTH to find out the prevalence of an anemia in pregnancy and its outcome.

RESULTS

Total number of patients with complete antenatal sheet since the establishment of this hospital till 30th December 2006 were 863. The prevalence of anaemia found is 368 which is 42.6%. As anaemia is classified in to three degrees according to WHO in to mild degree (9.0-10.9 gram%), moderate degree (7.0-8.9 gram %) and severe degree (less than 7 gram%). The prevalence of mild anaemia was 90.8%, moderate anaemia 7.1% and severe anaemia was only 2.2%. Three cases of severe anaemia were admitted and given blood transfusion. The mean haemoglobin level among anaemic women was 8.75 gram%.

The prevalence of preterm delivery among anaemic patients was only 3.0% (11 out of 368). The pregnancy outcome was measured in terms of condition of the baby at birth, weight of the baby and apgar score given.

Only 48 (13.0%) women out of 368 anaemic mother were less than 19 years of age, majority (84.8%) of women were in the age group of 20-35 years and only 8 women (2.2%) were more than 36 years-old.

Total number of patients was 368 and number of baby bore were 372 with four sets of twin delivery. Weight of the baby was classified in to three groups total of 62 babies were less than 2.49 kilogram (16.7%). Five babies (0.7%) were born with severe birth asphyxia and there were 4 cases of intra uterine fetal death (0.6%). Rest of the babies was given good apgar score. The mean birth weight of the babies with anaemic mother was 3.2 kilogram.

Those women who had haemoglobin more than 11 gm% were 495 with two sets of twin. Total number of babies born was 497 and there were two cases of preterm delivery (0.4%) and two cases of intra uterine fetal death (0.4%) the mean birth weight is 3.3 kilogram.

All women visiting NMCTH for antenatal check-up were subjected for routine and microscopy examination of stool along with other antenatal investigations. The prevalence of hook worm infestation was 10% (38 cases out of 368); ascariasis were found in 10 cases and 4 cases with entamoeba histolytica and Giardiasis. Rests of reports (85.9%) were with in normal limits. Among nonanaemic women, hook worm infestation found to be 6.6% (33 cases out of 495).

DISCUSSION

Anaemia is the common problem in female population which is understood as due to monthly menstrual blood loss. If we see Anaemia in nonpregnant female most common causes are due to excessive blood loss during menstruation, hookworm infestation, chronic nutritional deficiency and rarely malignancy. In pregnancy it is more severe because of increase demand and decrease intake either due to nausea, decrease appetite, lack of knowledge, chronic diseases or due to poverty.²³ Iron deficiency Anaemia is the commonest cause of anaemia in developing countries. Hookworm infestation is another cause of Anaemia as WHO has emphasized the need of epidemiological studies.^{24,25} In our study the prevalence of anaemia in pregnancy is 42.5% which is more than in a study done in Bangkok in 2003 showed the prevalence 19.2%²⁶ and less than another study done in Tanzania found the prevalence of anaemia during pregnancy of 50.0-60.0%.²⁷ Our study result has come closure to a study done by Loan in Pakistan with prevalence of anaemia 49.7%. A study done in Patan Hospital of Nepal found that most of the

anaemic patients were with low ferritin level (56.5%).²⁸ Another study done in France showed among anaemic pregnant women 92.7% had Iron deficiency anaemia.²⁹ In our study the prevalence of preterm delivery among anaemic patients was only 3.0% (11 out of 368) which is very minimal in comparison with a study done by Guindi where the prevalence was 29.2% among anaemic women.²⁹

Another study done in South Africa showed the prevalence of preterm delivery was 39.9%.³⁰ According to Philips severe anaemia is associate with the birth of small babies either preterm or IUGR.³¹ One Indian study which was conducted in a community level showed very high prevalence (96.5%) of anaemia in pregnancy in rural area of Delhi³² which is not comparable with hospital based study.

The mean haemoglobin level among anaemic pregnant women was 8.75 gm% which is much less than in study by Mengi V *et al* with mean haemoglobin 10.19gm%.³³

Another study done in eastern region of Nepal showed the prevalence of anaemia in adolescent girl is 68.8%. In our study adolescent girls were 108 out of 863 (12.5%) and 5.5% of adolescent pregnant girl were anaemic.

Regarding IUGR, there were only 16.6% (62) babies weighing less than 2.49 kg including 11 cases of preterm birth which is negligible in relation to a study done by D Acharya where the prevalence was 69.0% in anaemic pregnant women.³⁴ The result of stool examination of anaemic women showed hook worm infestation in 10.0% of cases whereas nonanaemic had only 6.0% hookworm infestation. This result corresponds to the result of a study done by Rai SK in a University hospital of Nepal where the study was done annually in a decade showing prevalence of hookworm infestation varied from 3.8% to 10.7% with a mean of 7.0%.³⁵

As we see a lot of cases of anaemia in developing countries, especially during pregnancy, public awareness comes to play the major role in preventive side. This study included only those women who came for regular antenatal check up and came to hospital for delivery as well so those are the group of women who are aware. So the results can't be generalized because there are a lot of women in community who are unaware, do not come for antenatal check up, that may be the reason for better result of this study in comparison to other studies.

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Table-1: Relationship between degree of anaemia and baby weight at birth

Age in Years	No.	Percentage	Degree of Anaemia			Baby Weight in Kg		
			Mild	Moderate	Severe	≤2.4 Kg	2.5 to 3.9	≥4.0Kg
<19	48	13.05	46	2	0	8	44	0
20-35	312	84.78	280	24	8	52	254	6
>36	8	2.17	8	0	0	2	6	0
Total	368	100	334	26	8	62	304	6

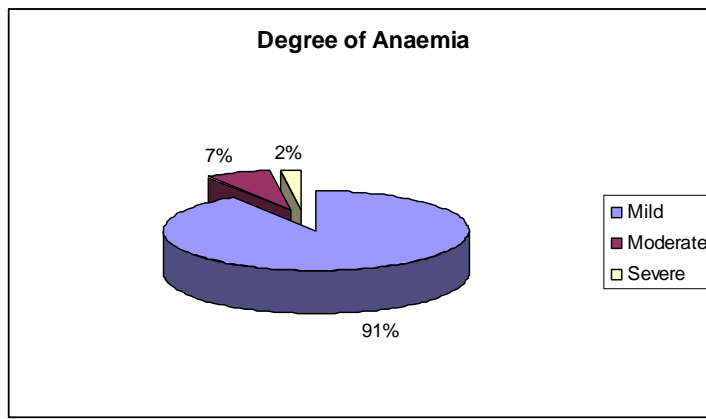


Fig. 1

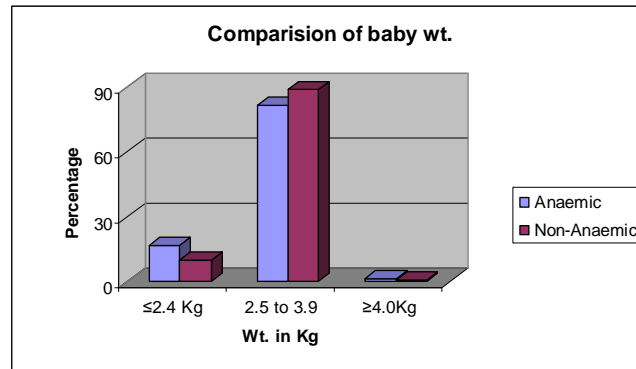


Fig. 2.

Table-2: Birth weight in non-anaemic women

Gravida	Number	Percentage	Baby Wt. in Kg		
			≤2.4	2.5-3.9	≥ 4.0
G1	242	48.89	27	214	1
G2-G4	239	48.28	22	217	4
≥G5	14	2.83	1	11	0
Total	495	100.00	50	442	5