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Prevalence of Anemia among Pregnant Women in Tertiary Care Teaching Hospital in Nepal

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Abstract

Introduction: Anaemia in pregnancy is condition in which the blood doesn't have enough healthy red blood cells to carry oxygen resulting in poor maternal and fetal outcome. The primary objective of this study was to determine the prevalence of anaemia in pregnant women in tertiary care teaching hospital in Nepal.

Methods: A retrospective study was conducted among pregnant women who had delivered (vaginal or cesarean) at Rapti Academy of Health Sciences (RAHS) between April 14, 2023 to April 13, 2024. Ethical clearance from the Institutional Review Committee of RAHS was obtained and then data on participant's age, ethnicity, obstetric history, and hemoglobin level were collected from the hospital records.

Results: Hospital records of 2,501 pregnant women were analyzed in this study, and the prevalence of anaemia was found to be 19.75%. Prevalence of anaemia was found to be highest among the pregnant women from Terai Madhesi ethnic background (45%). Among 484 women who had history of abortions, 110 had anaemia i-e. 23%. The more number pregnancies there were in a woman, the higher the prevalence of anaemia, from 19% in the first and second pregnancies to 41% in women with six pregnancies. Prevalence was seen lowest among women from age group of 15-19 years (0.4%) and highest among women aged 35 and above (24.3%).

Conclusions: The prevalence of anaemia in pregnant women was low (19.75%) compared to that of national data (46%). However, the prevalence varied across different ethnic groups. Anaemia was more prevalent among older women, those with higher gravidity, and those with a history of abortion, indicating a need for targeted antenatal monitoring in these groups.

Keywords: Age, Anaemia, pregnancy

Introduction

Anaemia in pregnancy is condition in which the blood doesn't have enough healthy red blood cells to carry oxygen resulting in poor maternal and fetal outcome. Premature birth, low birth weight, and maternal mortality are among the negative outcomes that have been linked to anemia during pregnancy. Anemia affected 30% of women aged 15 to 49 and 37% of pregnant women.[1] Anemia is defined by the World Health Organization as a hemoglobin (Hb) <110 g/L (<0.33/L.) during pregnancy and <100 g/L postpartum. Anemia in pregnancy is classified as mild anemia (Hb levels 9 to 10.9g/dL), moderate anemia (Hb levels 7 to 8.9g/dL), and severe anemia (Hb levels less than 7g/dL).[2] Defined as a haemoglobin concentration (Hb According to the classification of World Health Organization (WHO), pregnant women with hemoglobin levels less than 11.0 g/dl in the first and third trimesters

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are considered anaemic while in 2nd trimester less than 10.5 g/dl are considered anaemic.[3] According to WHO, 42.0% of pregnant women and 30.0% of non-pregnant women are anemic, worldwide.[4] According to Nepal's Demographic and Health Survey (DHS), 46% of pregnant women and 41% of women between the ages of 15 and 49 were anemic. The prevalence of anemia was higher in the plains (52%), than in the hills (29%), or mountains (35%).[5] This study aims to determine the prevalence, severity, and sociodemographic distribution of anemia in pregnant patients who visit the obstetric department of the RAHS tertiary level teaching hospital in Dang, Nepal.

Methods

A retrospective study was carried out among pregnant women who had delivered (vaginal or cesarean) in Rapti Academy of Health Sciences, Dang. Ethical clearance was acquired from the Institutional Review Committee (IRC) of RAHS prior to data collection. The study used census sampling method that included data of all pregnant women who had delivered (vaginal or caesarean) in RAHS from 14th April 2023 to 13th April 2024. The data was obtained from record collected from Department of Obstetrics RAHS and filled in proforma. The inclusion criteria of this study included all pregnant women who had delivered (vaginal or cesarean) in Rapti Academy of Health Sciences while exclusion criteria were non pregnant women, ectopic pregnancy, molar pregnancy, abortion, pregnant women who had not delivered and deliveries conducted in facilities other than RAHS. The study only included records with complete information as some of the data were missing as the study was retrospective and could not be included. Total deliveries during the given study period was 3,116 and after excluding the records with incomplete information, a total of 2,501 women's record were reviewed which included information on women's age, ethnicity, obstetric history, and hemoglobin level and was filled in proforma which included all relevant information. The data was summarized using descriptive statistics, such as percentages and frequencies with IBM SPSS Statistics 22.

Results

Hospital records of 2,501 pregnant women were analyzed in this study, and the prevalence of anaemia was found to be 19.75%. This indicates that nearly one in five pregnant women in the study population were affected by anemia, underscoring it as a significant public health concern. The prevalence suggests a moderate burden of anemia, which has implications for both maternal and fetal health outcomes. Further analysis by age group, ethnicity and obstetric history was done to provide more insight into specific risk factors and vulnerable subgroups within the population.

Of those with anaemia, the majority (17.91%) had mild anaemia, with only 1.64% experiencing moderate anaemia and 0.20% severe anaemia.

Table 1: Prevalence of anaemia

Characteristic	Frequency (n)	Percentage (%)
Anaemia in Pregnant women (n=2,501)		
Non Anaemic	2,007	80.25
Anaemic	494	19.75
Severity of Anaemia (n=494)		
Mild Anaemia	448	17.91
Moderate Anaemia	41	1.64
Severe Anaemia	5	0.20

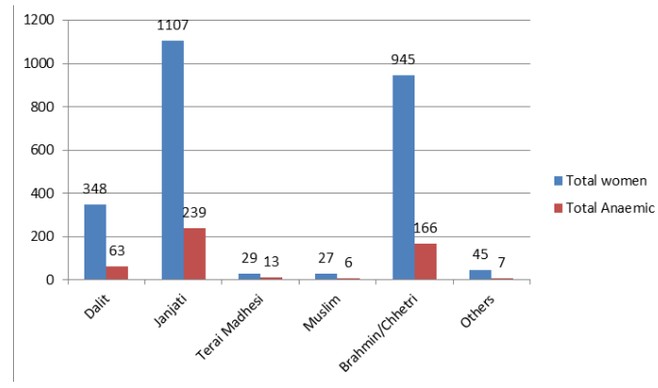

Figure 1: Anaemic pregnant women by ethnicity

Prevalence of anaemia in pregnant women by ethnicity

The data indicates that anaemia prevalence varies significantly across different ethnic groups. Notably, Terai Madhesi women have the highest prevalence at 45%, followed by Muslim and Janjati women at 22% and 21% respectively.

Anaemia prevalence among pregnant women increased with age, ranging from just 0.4% in the 15-19 age groups to 24.3% in women aged 35 and above.

Table 3: Prevalence of anaemia in pregnant women by age group

Characteristic	Frequency		Percentage (%)
Age of women (Years)	No. of women in the age group	No. of women with anaemia in the age group	
15-19	256	1	0.4
20-24	894	168	18.8
25-29	782	148	18.9
30-34	433	94	21.7
>=35	136	33	24.3

Among women with history of abortion, 23% were anaemic, which is slightly higher than in the general group. The prevalence of anaemia increased with the number of pregnancies, from 19% in the first and second pregnancies to 41% in women with six pregnancies.

Table 4: Prevalence of anaemia in pregnant women by obstetric history.

Characteristic	Frequency		Percentage (%)
Gravida	No. of women	No. of women with anaemia	
1	1027	193	19
2	896	169	19
3	368	74	20
4	138	35	25
5	43	12	28
6	22	9	41
7	3	1	33
8	4	1	25
History of abortion			
Women with history of abortion	484	110	23

Discussion

Pregnancy anaemia is a serious public health issue, especially in low- and middle-income nations like Nepal. It has been associated with poor maternal and fetal outcomes which includes preterm birth, low birth weight, and increased maternal mortality.[3,6] premature delivery, low birth weight, and other adverse outcomes. MATERIALS AND METHODS A prospective study was conducted on 1405 Iranian pregnant women who delivered during 2015. Blood was collected from all the subjects to measure the hemoglobin (Hb Children born to anaemic mothers are up to about 50% more likely to have anemia.[7] Several factors are known to influence the risk of anaemia during pregnancy, including maternal age, gravidity, prior obstetric history, and socio-demographic characteristic such as ethnicity. This study was aimed to determine the prevalence of anaemia among pregnant women delivering at RAHS.

The study revealed that the overall prevalence of anaemia was 19.74% among 2,502 pregnant women; the majority (17.91%) had mild anaemia, followed by moderate (1.64%) and severe (0.20%) anaemia. These figures are lower than national data from the Nepal Demographic and Health Survey (NDHS), which report anaemia in 32.7% of pregnant women.[8] This difference may be due to the hospital-based nature of the study, good antenatal care coverage as the figures form Karnali Academy of Health Sciences, Jumla showed prevalence of 17.9% which is similar to the findings of RAHS.[9] Additionally, between 2001 (40%) and 2016 (84%), the coverage of antenatal care (ANC) more than doubled.[10] As part of routine antenatal care, iron and folic acid (IFA) supplements, deworming, and dietary advice are given to avoid anemia in pregnancy.[11] This might also have helped decrease prevalence.

A similar trend was observed with gravidity, with anaemia prevalence rising from 19% in primigravida to 41% among women with six pregnancies. These trends suggest that repeated pregnancies and advancing maternal age may contribute to increased vulnerability to anaemia. Moreover, among women with a history of abortion, 23% were found to be anaemic – slightly higher than the general prevalence- indicating a potential risk group requiring closer monitoring. Given that bleeding is one of the side effects of abortion, women with a history of abortion may be more likely to experience anemia.[12]

Prevalence also varies in women with different ethnicity or health-seeking behaviours across different cultures.[9] Significant ethnic disparities were also noted in this study. Terai Madhesi women had the highest anaemia prevalence rate at 45% followed by Muslim (22%) and Janjati (21%) women. These disparities may reflect differences in nutritional practices, healthcare access, and socioeconomic status across ethnic groups, aligning with NDHS findings that show higher anaemia rates in the Terai region compared to hills and mountains.[8]

Being retrospective and hospital based, the study has some limitations as it did not capture anaemia prevalence among women who did not deliver at the facility, thereby limiting generalizability. Records with incomplete data were excluded, which may introduce selection bias. The study also lacked information on some important contributing factors such as iron supplementation during pregnancy and dietary intake as nutrition is the primary cause of anaemia during pregnancy in underdeveloped nations, among which iron deficiency anaemia is the most common cause.[13]

Conclusions

The study showed that nearly one in five pregnant women delivering at RAHS were anaemic, with mild anaemia being the most common form. Anaemia was more prevalent among older women, those with higher gravidity, and those with a history of abortion, indicating a need for targeted antenatal monitoring in these groups. Marked disparities were observed across ethnic groups, with Terai Madhesi women showing the highest burden of anaemia. These finding highlight the importance of routine screening, nutritional counselling, and appropriate iron supplementation throughout pregnancy, particularly for high-risk populations. The results call for further studies

to explore the underlying nutritional and socioeconomic variables that contribute to pregnancy-related anaemia, which would help in the development of effective strategies to reduce burden of anaemia and improve maternal and fetal health outcomes.

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