ORIGINAL ARTICLE

Factors Associated with Maternal Anemia and its Relationship with a Low Birth Weight of Newborn

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ABSTRACT

Objective: To determine maternal anemia and its relationship with the nutritional status and low birth weight of a newborn.
Study Design: Cross-sectional analytical study.
Place and Duration of Study: Tertiary Care Hospital KPK Peshawar from 1st January 2022 to 30th June 2022.
Methodology: Three hundred and eighty five individuals, aged between 18 to 45 years were enrolled. All patients with hemoglobin level <11 g/dl, low birth and normal were included. Patients with a history of hypertension and diabetes mellitus were excluded.
Results: The maternal anemia was found in 39.37% while low birth weight was among 16.62% result was significant (P=0.00). Mothers taking a balanced diet and milk regularly were reported with normal hemoglobin. Low birth weight was reported in multigravida 28.3% and 20.25% in primigravida. The multiparous give birth to 29.09% low birth weight and patients taking a gap of less than 2 years have a low birth weight of a newborn and he results were significant at P=0.043.
Conclusion: The maternal anemia can be a risk factor for the low birth weight of the newborn.
Keywords: Maternal anemia, Nutrition, Newborn, Deficiencies, Low birth weight

INTRODUCTION

A pregnant woman must pay close attention to her health throughout this time of rapid transformation to have a healthy baby, because a growing foetus is entirely dependent on its mother for nutrition, and optimum maternal health depends on adequate maternal nutrition. Numerous unfavourable maternal and foetal outcomes, including gestational diabetes, gestational hypertension, low birth weight, intrauterine growth limitations, and gestational and postnatal death, have been linked to poor maternal nutritional status. 2,3 Approximately 800 pregnant women died of pregnancy-related problems, and 99% died during childbirth, all of these fatalities occurring in developing countries, according to a joint report from the World Bank, UNICEF, WHO, and the United Nations Population Fund (UNFPA). About 40% of all maternal deaths after delivery are linked to anemia, which is a prominent cause of morbidity and mortality in pregnant women. 4 Anemia, which is defined as a low blood haemoglobin concentration, is still a significant public health concern in many developing nations. 5 Anemia is most common among pregnant women and children under the age of five, while it can affect adults at all stages of life. Anemia is typically linked to poor health. 6

In growing countries, in contrast to developed nations, anaemia in pregnancy is extremely prevalent. While the occurrence rates in Africa, Asia, and Latin America vary from 35% to 75%, much less than 30% of pregnant females in the USA suffer from tripla anemia. In Pakistan, maternal anemia-related mortality can reach 194 per 100,000 live births, in contrast to 24 per 100,000 live births in Nigeria. The Safe Motherhood Initiative (SMI) used to be mounted in 1987 via the United Nations Children's Fund and representatives from forty-five international locations to reduce maternal mortality globally by the year 2000. According to the findings of recent research on maternal morbidity and mortality in Sub-Saharan Africa, anaemia continues to play a significant role in this region's maternal mortality rates.Anemia during pregnancy is caused by a variety of factors, including dietary deficiencies in iron, folate, and vitamin B12, as well as external factors such as malaria and hookworm.The proportional significance of every one of these elements in inflicting anaemia at some stage in pregnancy varies notably depending on the region, the time of year, and dietary habits. Iron and folate deficits are the most common reasons for anaemia in pregnant females in sub-Saharan Africa. Nutrition B12 deficiency can contribute to anaemia in this region of the world unknowingly due to the population's reliance on grains as an essential meal supply and the restricted consumption of dietary ingredients of animal origin, which are the primary supply of dietary nutrition B12.7 Iron deficiency is the most common dietary cause of anemia, accounting for approximately 50% of all occurrences worldwide and anaemia in pregnancy.Iron deficiency is typically caused by low dietary iron consumption and decreased iron availability due to an overreliance on plant-based diets and iron absorption inhibitors such as phytate.8

Multiple physiological changes during pregnancy necessitate an increase in iron intake.Malaria and hookworm play important roles in the pathogenesis of anaemia in pregnancy. 9 Consequences of anemia consist of decreased work ability and danger of mortality for the pregnant female leads to delivery problems low birth weight and cause less chance of improvement of infant.Furthermore, mateanaemianthropometry and being underweight and theobese are risks of pregnancy with negafemale, whichutcomes.In comparison to women of normal weight, obese pregnant women have a higher risk of foetal macrosomia, a low APGAR score, perinatal death, developing gestational diabetes, and two cases of increased risk of developing hypertension issues.11 Maternal underweight will exacerbate problems during the IU's life.Since the last ten years, females or girls aged 15 to 49 have been prone to obesity and weight gain.Therefore, the purpose of this study was to evaluate factors related to maternal anaemia and its relationship with low birth weight.

MATERIALS AND METHODS

This cross-sectional analytical study was conducted in tertiary care hospitals of Peshawar after the approval of the synopsis from the Ethical Board of Gandhara University Peshawar from 1st January 2022 to 30th June 2022. The sample size was 385 non-probability convenient sampling was used for the collection of samples from patients visiting or admitted in the Gynaecology Department of Hayatabad Medical Complex and Lady Reading Hospital Peshawar. The age of the patient was from 18 to 45 years inclusion criteria were primigravida and multigravida with term pregnancy age from 18 to 45 years included. Patients with a history of hypertension and diabetes mellitus and unwilling to give information were excluded. Different variables were taken like age, gravidity, Hb, balanced diet and gap in pregnancy the average birth weight for babies is around 3.5 kg, whereas babies whose weight was more than 2500 g were considered normal and weight less than 2500 grams were categorized as low birth weight. Maternal anemia was defined as hemoglobin levels below 11 g/dL

The data was import to SPSS-21. The Chi-square test was applied to assess the association between the outcome variable (newborn) weight) and maternal anemia while for dependent variables 't' test was applied. A P<0.05 was considered significant value.

RESULTS

The maternal hemoglobin was normal in 60% of the females while 39.37% of the females were anemic with low hemoglobin. The weight of the new born was normal in 57.40 % while 16.62 % of the newborn with low birth weight. Females taking no balance diet and supplements like vitamin C, iron and zinc were 34.4% and 24.93% with low birth weight respectively. Low birth weight was also found in multigravida 33.5% and in primiparous with 10.38%.patient with low birth weight having a pregnancy with a gap of 2 to 3 years were 16.62% while patients taking clay and dirt got babies with low birth weight (Tables 1-4).

Table 1: Frequency of maternal anemia and weight of newborns

Variable	Normal	Anemia	χ^2value	P value
Maternal HB	233 (60%)	152 (39.37%)	28.092	0.000
Weight of newborn	321(57.40%)	64(16.62%)	28.092	0.000

Table 2: Balance diet associated with maternal anemia

Balance Diet	Normal	Anemia	χ^2value	P value
Yes	159(41.3%)	37 (9.6%)	9.162	0.002
No	77(20%)	112 (29.0%)		

Table 3: Different supplements associated with maternal anemia

Iron, Vit. C and zinc supplements	Normal	Anemia	χ^2value	P value
Yes	181 (47.01%)	62 (16.1%)	36.667	0.000
No	46 (11.94%)	96(24.93%)		

Table 4: Factors associated with a low birth weight of newborn

Variable	Normal	Low birth weight	χ^2value	p-value
Gravidity	33(8.57%)	14(4.13%)		
Primgravida	80(20.77%)	82(21.29%)	6.266	0.044
Multigravida	47(12.20%)	129(33.50%)		
Primiparous	64(16.62%)	40(10.38%)	7.823	0.050
Multiparous	169(43.89%)	112(29.09%)		
Miscarriage	25(6.49%)	18(4.67%)		
Stillbirth	33(8.57%)	15(3.89%)		
Normal vaginal delivery	144(37.40%)	86(22.33%)	8.175	0.043
C section	38(9.87%)	26(6.75%)		
Pregnancy gap ≥1-2year	119(30.90%)	43(11.27%)	3.884	0.043
≤ 3 years	159(41.2%)	64(16.62%)		
Non-Food Item Nil	204 (52.98%)	105 (27.27%)	16.542	0.000
Clay/Dirt	18 (4.67%)	31 (8.05%)		
Wall chalk	13 (3.37%)	14 (3.63%)		

DISCUSSION

Worldwide, anaemia is a leading cause of morbidity and mortality in women and children. Intake of these nutrients is crucial throughout the critical period of life since deficits in significant micronutrients like iron folate, and vitamin B12 before and during pregnancy increase the chance of anemia. On the other hand, there is little evidence available regarding the dietary intake of food among pregnant ladies of Ghana, living in rural areas. The prevalence of anaemia and inadequate dietary nutrient consumption by pregnant ladies residing in rural areas, a comparative cross-sectional study comprised 379 pregnant women have 56.5% had anaemia.[14]

In the present study 39.37% of patients visiting the gynaecology department were reported as anemic while 60% of patients with normal Hb levels. Higher prevalence of anemia was found in rural than in urban areas. The majority of survey participants consumed insufficient amounts of iron, zinc, folate, calcium and vitamin A in the present study 20.77% of pregnant females were deficient in vitamins, iron and zinc. From the initial 24-hour recall, the study population's mean dietary diversity score (DDS) was 3.81 and 28.8% of the 379 women attained the required level of dietary diversity for women. The dietary diversity score, gestational age and maternal age were the independent predictors of haemoglobin concentration. Accordingly, respondents with low DDS had a higher likelihood of being anemic than respondents with high DDS (OR = 1.795, p = 0.022, 95% CI: 1.086 to 2.967).[7]

The current study showed that 20.77% of females were deficient in iron and other supplements like vitamin C and zinc while 34.4% were reported anemic by not taking a balanced diet. Another study in Sub-Saharan Africa, investigated the relative contributions of anemia in pregnant women caused by iron, folate, and B12 insufficiency. The study included a total of 146 pregnant women who visited two prenatal clinics in Gombe, Nigeria. 54% of the girls were in their third trimester at the time. Blood samples were purchased to measure the haematocrit, serum iron, total iron-binding capacity, ferritin, folate, nutrition B12 and homocysteine levels. In the past, (9.4%) of ladies had malaria. A haemoglobin level of less than 105 g/L led to the anaemia classification of forty-four (30%) women.[14] This study showed that 39.37% females reported as anemic with Hb less than normal. The serum ferritin concentration (10 ng/mL), iron insufficiency used to be the main cause of anaemia. Iron deficiency used to be the most common cause of anaemia among pregnant women in northern Nigeria.[14] In the present study, iron deficiency anemia was very prominent because of low-balance diet intake and low iron supplements.

An investigation of the factors influencing low birth weight in the Afghan population was the goal of a study carried out in 2015 showed that low birth weight of less than 2.5 kg. Most of the 15.5% of infants with low birth weight in the research were female. In the present study, 16.62% of with low birth weight was reported. Other numerous characteristics, such as maternal education, location or place of residence, income, and the urban region where low birth weight was prevalent, were also taken into account in the study.[15]

Another study done in NWFP-Pakistan on the risk factors for low birth weight in the public hospitals in Peshawar revealed that, in addition to gestational age, specific geo-demographic factors (maternal age, consanguinity, and nationality), maternal health (anaemia), and pregnancy history (abortion/miscarriage) were significantly related to the incidence of LBW seen at the four hospitals surveyed in Peshawar. These findings suggest that cultural variables may have a negative impact on the prevalence of SGA in this region of Pakistan. Low birth weight was discovered in the current investigation in stillbirth, C-section and miscarriage. Seventeen in the present study 16.62% of babies with fewer than two years between pregnancies and 9.87% of babies with more than three years between pregnancies had low birth weights.[16]

A major factor in newborn survival, health, and development is low birth weight. There are numerous biological and maternal risk factors for it. This study's goal is to identify the prevalence of low birth weight and its related risk factors. A cross-sectional study was conducted at Al-Razi Hospital in Rawalpindi's obstetrics and gynaecology department, the prevalence of LBW was determined to be 8.9% overall. Male babies (7.9%) had a significantly higher likelihood of having LBW than did female babies (9.9%) in the present study there is no gender.[17] In the present study there was no discrimination among gender and low birth weight were found in females taking low supplements and a balanced diet. Low birth weight was also found in patients having less than 2-year gap in pregnancy while multiparous and multigravida was also given birth to low birth weight.

CONCLUSION

Maternal health was very important for the newborn. Factors associated with maternal anaemia can cause the low birth weight of the newborn, and patients with fewer gaps in pregnancy are also at risk for the low birth weight of the newborn.

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