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Association Of Third Trimester Maternal Hemoglobin Level With Newborn Birth Weight In Term Babies, In A Peripheral Hospital Of Kashmir.

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Abstract
Introduction*: Anaemia is one of the main nutritional deficiency disorders affecting a large proportion of the population, not only in developing but also in industrialized countries. The high prevalence of iron and other micronutrient Deficiencies among women before and during pregnancy in developing Countries is of concern and maternal anaemia is still a cause of considerable perinatal mortality and morbidity. The improvement in the industrialized world is due largely to more effective diagnosis and treatment of anaemia.*
Aim of the study*: To find association between 3rd trimester maternal haemoglobin levels with birth weight of neonates.*
Results*: The prevalence of low birth weight among anemic mothers was 24%. Total Number of babies with blood haemoglobin <16.8 gms% in mild anemic Mothers were 74 (80.4%) moderate anaemia were 43 (79.6%) and in severely anemic mothers were 2 (50%). The demographic data of patients were studied for the 3 groups (mild, moderate, severe according to the WHO classification of anaemia). The means of the continuous variables were compared between the two groups using analysis of variance ANOVA. The P value of <0.05 was considered statistically significant*
Conclusion*: Severity of maternal anaemia is determinant of low birth weight. The proportion of low birth weight in babies born to severe anemic mothers Were more when compared to mild and moderate anaemia.*

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I. Introduction

Anaemia has been defined as a reduction of the haemoglobin concentration or red blood cell (RBC) volume below the range of values occurring in healthy persons. Anaemia is a common health disorder during pregnancy. According to the World Health Organization, the diagnosis of anaemia in pregnant women is established when the concentration of Hb is below 11 g/dl. Anaemia is associated with various adverse effects on newborns especially low birth weight A study by Kozuki *et* al found that moderate to severe maternal anaemia have a link with intra-uterine growth retardation. Anaemia during pregnancy as per definition of WHO is classified as mild 10-10.9g/dl, moderate 7-9.9 g/dl and severe as < 7 g/dl. Nutritional deficiencies (iron, folic acid etc) and increased plasma volume leading to hemodilution are main reasons for anaemia during pregnancy. Prevalence of anaemia during pregnancy in India is estimated to be around 45 – 75%.

Low birth weight is defined as weight < 2.5 kg, very low birth weight as < 1.5 kg and extremely low birth weight as that < 1 kg.

Increased nutritional requirements during pregnancy needs more supplementation especially that of iron, if adequate supplementation is not given less oxygen supply to foetus will lead to many adverse outcomes including intra uterine growth retardation, preterm labour and even intra uterine death. There is more risk if such deficiency occurs during first and second trimester and there is enough literature in support of this e.g Elhassan *et* al and Haggaza *et* al in their study to investigate the prevalence of and risk factors for LBW, they found that 12.6% and 14.9% of the neonates had LBW; respectively, maternal anaemia was the main risk factor for LBW. Klebanoff *et* al found that anaemia in the second trimester, was positively associated with preterm delivery There is a well documented link between first and second trimester anaemia and low birth weight, but in this study we tried to study effect of third trimester Hb level on birth weight.

Objective

To find association between 3rd trimester maternal haemoglobin levels with birth weight of neonates.

II. Material And Methods

This was a hospital based cross sectional study done in sub district hospital Kupwara from Feb. 2021 to Nov. 2021. The study included 100 pregnant women who were delivered (LSCS or VAGINAL DELIVERY) in our hospital from Feb. 2021 to Nov 2021.

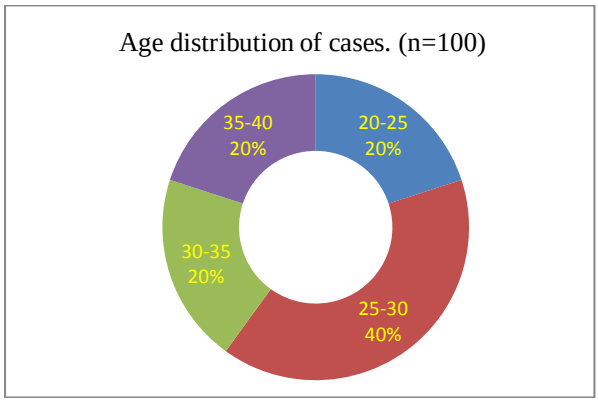
All those women with non singleton pregnancy, chronic systemic diseases (diabetes mellitus, HTN etc), preterm deliveries, women on chronic medications, those who gave birth to neonates with major congenital defects, neonates who needed resuscitation at birth were excluded.

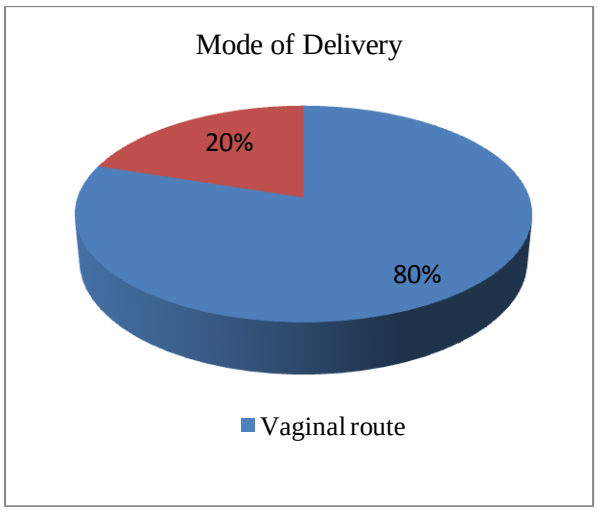
Maternal data was taken from medical records and neonatal weight was done 30 minutes after delivery on electronic weighing scale without clothes. Classification of women was done as per 3rd trimester haemoglobin levels and were classified as those with Hb < 9, Hb 9 – 11, Hb > 11 g/dl.

Further, all data was analysed statistically using SPSS software and Microsoft excel.

III. Results and Observations

A total of 100 pregnant women were studied. Mean 3rd trimester maternal Hb was 10.7±1.3 g/dl and mean neonatal weight was 2.6 ± 0.29 kg. Mean age of patients was 28 ± 3.8{age (years)±S}





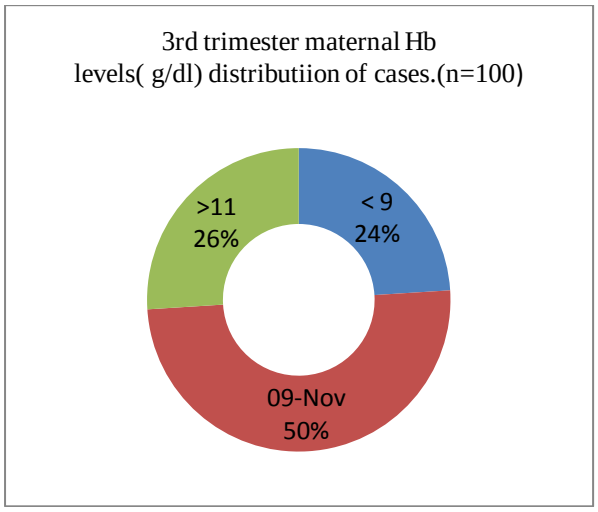


Table 3: Showing 3rd trimester maternal Hb levels (g/dl) distribution of cases.(n=100)

Mean Hb level(g/dl)	N	%age
< 9	24	24
9-11	50	50
>11	26	26
TOTAL	100	100

Mean weight of neonates in those cases with Hb < 9g/dl was 2.1 ± 0.39 kg, in those with Hb between 9-11 g/dl was 2.9 ± 0.25kg and in those with Hb <11 g/dl was 2.5 ± 0.31 kg**.**

IV. Discussion

Anaemia is a common health disorder affecting both developing and developed countries worldwide. As per a study of 2005 worldwide more than 1.5 billion people are affected by anaemia..Maternal anaemia has various adverse effects on foetus especially on birth weight. Increased nutritional requirements during pregnancy needs adequate iron and folic-acid supplementation. Inadequate supplementation leads to various adverse effects on mother and foetus. Anaemia in pregnancy is linked with amplified risk of maternal and perinatal mortality, premature delivery, low birth weight, and other adverse outcomes. In resource poor countries due to under nutrition in the mother before and during pregnancy the occurrence of low birth weight (LBW) is common.

World Health Organization, the diagnosis of anaemia in pregnant women is established when the concentration of Hb is below 11 g/dl. LBW is defined as a newborn weighing less than 2,500 grams at birth. Iron deficiency anaemia (IDA), is the most common form of anaemia prevalent in resource poor countries. It has been linked to a higher risk of low birth weight, preterm delivery..This can also permanently impair intelligence, motor, and behavioural development. During childbearing age the amount of iron that is being consumed is too little to counterbalance the losses from menstruation and the increased demand linked with gestation.

Studies show that supplementation with iron or iron-folic acid should be started early in pregnancy if not before, to prevent low birth weight. Maternal nutrition along with maternal haemoglobin concentration plays a vital role in the growth and development of the foetus. Foetal growth occurs in various phases and there is 4-fold increase in weight of foetus from 28 weeks to 39 weeks of gestation so adequate supplementation should be there during this period and also most of the micronutrient related issues occur in the third trimester. Inadequate supplementation is more prevalent in developing and resource poor countries hence, studying the impact of anaemia during the third trimester on the foetal outcome would be more helpful.

In addition, effect of first and second trimester Hb levels on birth weight is well documented but in this study, we tried to find association between 3rd trimester Hb levels on birth weight in a far flung hospital of Kashmir.

The study included 100 pregnant women who were delivered (LSCS or VAGINAL DELIVERY) in our hospital from Feb. 2021to Nov. 2021.

Mean 3rd trimester maternal Hb was 10.7 ± 1.3 g/dl and mean neonatal weight was 2.6 ± 0.29 kg. Mean age of patients was 28±3.8 {age (years) ± SD}. Our findings were consistent with those of Fatima Eisa *et* al. 3rd trimester maternal haemoglobin levels < 9 g/dl was found in 15%, 9-11g/dl in 40% and >11g/dl in 10% cases respectively. Our findings were consistent with a study done by Gomber *et* al.

Mean weight of neonates in those cases with Hb <9 g/dl was 2.1 ± 0.39 kg , in those with Hb between 9-11 g/dl was 2.9 ± 0.25 kg and in those with Hb <11 g/dl was 2.5 ± 0.31 kg. Our study showed that adequate birth weight was found in those neonates born to mothers with Hb between 9 to11 g/dl. Our findings were consistent with those of Kazibe Koyuncu *et* al.

V. Conclusions

Our study highlights the still prevalent anaemia and inadequate supplementation with iron and folic acid especially in far-flung areas of Kashmir, despite adequate efforts to provide adequate antenatal care through public health. Our result shows that maternal anaemia during the third trimester significantly increases the risk of low birth weight. Maternal anaemia can be prevented during pregnancy by providing knowledge and proper nutrition before and during pregnancy. Our study will help health workers to adequately address the issue of anaemia in pregnancy prevent its adverse effects on foetus.

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