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Clinical Research

Rize İlinde Maternal Anemi Prevelansı ve Bebek Doğum Ağırlığına Etkisi
The Prevalence of Maternal Anemia and Its Effect on Infant Birth Weight in Rize Province

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Abstract

Aim:

Anemia is a common problem that complicates pregnancy. Anemia during pregnancy is associated with many fetal and maternal complications. In this study, we aimed to determine whether anemia during pregnancy has an effect on baby birth weight.

Materials and Methods:

The data of pregnant women who gave birth at 37-41 weeks of gestation in our hospital were retrospectively scanned. Among these patients, those who were followed up in the pregnancy outpatient clinic of Recep Tayyip Erdogan University Training and Research Hospital and received iron supplements throughout their pregnancy were included in the study. Pregnant women with hemoglobin values below 11 g/dl for all three trimesters were considered to have anemia. The haemoglobin levels of pregnant women in all three trimesters were used to compare the infant birth weights of anaemic and non-anemic women.

Results:

523 pregnant women who gave birth in our hospital were included in this retrospective study. The prevalence of anemia in the first, second and third trimesters of the pregnant women included in the study was determined to

be 6.5%, 23.32% and 17.7%, respectively. The first trimester hemoglobin average of the pregnant women included in the study was 12.39±1.06 g/dl, the second trimester hemoglobin average was 11.44±1.04 g/dl and the third trimester hemoglobin average was 11.75±1.29 g/dl The average birth weight was 3355.09 ±427.70 g. There was no statistically significant difference in the average birth weight of newborns born to anemic and non-anemic pregnant women during all three trimesters. Conclusion:

Maternal anemia is still prevalent in Rize province. However, in those who received iron supplements during pregnancy, no effect was found on the birth weight of the newborn, even if there was maternal anemia. Our study reveals the importance of regular follow-up of pregnant women and taking iron supplements. It could be concluded that it is possible to prevent the fetal and maternal effects of anemia before they arise.

Keywords: Anemia, infant birth weight, pregnancy, prevalence

Introduction:

Anemia is a common problem complicating pregnancy. According to the data of the World Health Organization (WHO), 38.2% of pregnant women worldwide have anemia. The most common cause of this common clinical problem is iron deficiency anemia (1). Symptoms caused by anemia in pregnant women also affect the quality of life negatively. Symptoms associated with anemia include fatigue, weakness, distraction, loss of appetite, and difficulty concentrating. It also negatively affects physical function and mental health (2). Anemia in pregnancy is associated with many fetal and maternal complications. These complications include prolonged hospitalization time, preeclampsia, high cesarean section rate, increased need for intrapartum and postpartum blood transfusion and neonatal and maternal death (3). For this reason, increasing awareness of anemia by both obstetricians and pregnant women will contribute to the improvement of pregnancy experience.

WHO defines anemia in pregnancy as a hemoglobin (Hb) level lower than 11 g/dL in each trimester (1). However, there is no consensus on this definition. From the first periods of pregnancy, the plasma volume gradually increases and reaches its highest value around 24 weeks. In addition, there is an increase in the erythrocyte mass of the expectant mother. However, hemodilution occurs due to the greater increase in plasma volume. Due to these physiological changes in pregnancy, there are many international sources that accept the cut-off value as 10.5 g/dL for the definition of second trimester anemia (4).

In this study, it was aimed to determine the prevalence of maternal anemia in Rize and whether anemia during pregnancy has an effect on infant birth weight. In addition, the effect of anemia levels on baby birthweight in all three trimesters was examined separately, and the effect of anemia in any period of pregnancy on birth weight of infants was evaluated.

Materials and Methods:

The data of pregnant women who gave birth at 37-41 weeks of gestation in Recep Tayyip Erdogan University Training and Research Hospital (RTEUTRH)between January 2021 and July 2022 were reviewed retrospectively. The study included patients who were followed up in the pregnancy clinic of (RTEUTRH)since the beginning of pregnancy.The study group included pregnant women with anemia, defined as having an Hb value below 11 g/dl for all three trimesters.Pregnant women with a Hb value above 11 g/dl were included in the control group. The infant birth weight was compared between the 1st, 2nd and 3rd trimester anemic and non anemic pregnant women. . In addition, pregnant women were divided into 4 groups according to their Hb levels.

Group 1: Pregnant women who are anemic in the first and third trimesters.

Group 2: Pregnant women who are anemic in the first trimester but not anemic in the third trimester.

Group 3: Pregnant women who are not anemic in the first and third trimesters.

Group 4: Pregnant women who are not anemic in the first trimester but anemic in the third trimester.

The age, mode of delivery, Hb levels, week of delivery and fetal birth weights of all pregnant women included in the study were recorded. The relationship between newborn baby birth weights in all 4 groups was evaluated statistically.

Inclusion criteria for the study:

Among pregnant women at 37-41 weeks' gestation who gave birth between January 2021 and July 2022, those who had a single live birth and whose first, second, and third trimester hemogram values were available were included in the study.

Exclusion criteria:

Maternal causes; hypertensive diseases, gestational diabetes, antepartum hemorrhage, chronic diseases, HIV (+), HbsAg (+), VDRL (+)

Fetal causes; multiple pregnancies, fetal anomaly.

Statistical method: Statistical Package for Social Sciences (SPSS version 20.0) program was used for statistical analysis. While evaluating the study data, in addition to descriptive statistical methods (Mean, Standard Deviation, Median, Frequency, Ratio, Minimum, Maximum) in the comparison of quantitative data, the Student's t-test was used in the comparison of the parameters with normal distribution in two groups, and the Mann-Whitney U test was used in the comparison of the parameters for non-normal distribution. Chi-square test was performed to determine the relationship between categorical variables. Statistical significance level was considered as 5%. The study was reviewed according to the "Helsinki Statement" and "Good clinical practice guideline" and was prepared "duly" according to the guideline.

Ethics Approval: Approval for the study was obtained from the ethics committee of Recep Tayyip Erdogan University (decision no: 2022/188).

Results

523 patients who gave birth in our hospital were included in the study. The mean maternal age at birth was 30.39±5.61/year, the mean gestational age was 273.02±6.94/day, the mean Hb values were 12.39, 11.44, 11.75 for 1st, 2nd and 3rd trimesters, respectively. The mean birth weight was 3355.09 ±427.70 g. Demographic data of pregnant women included in the study are shown in Table 1.

Table 1: Demographic data of pregnant women included in the study (Values are given as mean±standard deviation)

Gestational age at birth (days)	273.02±6.94
Maternal age (years)	30.39±5.61
1st trimester hemoglobin (g/dl)	12.39±1.06
2nd trimester hemoglobin (g/dl)	11.44±1.04
3rd trimester hemoglobin (g/dl)	11.75±1.29
Birth weight (g)	3355.09 ±427.70
Number of individuals (n)	523

According to first trimester Hb levels, 34 (6.5%) patients were found to be anemic. The difference in maternal age, infant birth weight and gestational age at birth was not statistically significant between patients with anemia in the first trimester and those with normal Hb levels (p=0.909, p=0.912, p=0.791). According to the second trimester Hb levels, 122 (23.32%) patients were found to be anemic. The difference in maternal age, infant birth weight and gestational age at birth was not statistically significant between patients with anemia in the second trimester and those with normal Hb levels (p=0.421, p=0.913, p=0.809). According to

third trimester Hb levels, 93 (17.7%) patients were found to be anemic. The difference in maternal age and infant birth weight was not statistically significant between patients with anemia in the third trimester and those with normal Hb levels (p=0.308, p=0.051). The difference in gestational ages at birth among these groups was statistically significant (p = 0.016).The data of pregnant women with 1st, 2nd and 3rd trimesters who are anemic and have normal Hb levels are shown in Table 2.

Table 2: Comparison of anemic and normal pregnant women in the first, second and third trimesters (values are given as mean±standard deviation)

	1st trimester			**2nd trimester**			**3rd trimester**		
	Anemic group	Non-anemic group	p	Anemic group	Non-anemic group	p	Anemic group	Non-anemic group	p
Number of individuals n (%)	34(%6.5)	489(%93.5)		122 (%23.32)	401(%76.68)		93 (%17.7)	430(%82.3)	
Maternal age (years)	30.09±5.47	30.42±5.62	0.909	29.98±5.14	30.52±5.75	0.421	29.3±5.32	30.61±5.65	0.051
Gestational age at birth (days)	272.47±6.11	273.06±7	0.791	272.77±6.55	273.09±7.06	0.809	271.4±6.37	273.37±7.01	0.016
Birth weight (g)	3357.65±414.79	3354.92±429	0.912	3364.84±419.51	3352.13±430.64	0.913	3313.33±360.78	3364.13±440.7	0.308

According to the birth weights, there was no statistical significance between the study groups (p=0.637, p=0.608, p=0.235, p=0.198). Table 3 shows the data for the four groups of pregnant women included in the study.

Table 3: Evaluation of infant birth weight according to groups (SD: standard deviation)

	Anemic group		**Non-anemic group**		
	n	Birth weight (g) ±SD	n	Birth weight (g) (g) ± SD	p
Group1	13	3433.08±505.86	510	3353.11±425.92	0.637
Group 2	21	3310.95±352.64	502	3356.94±430.75	0.608
Group 3	409	3366.86±444.93	114	3312.89±357.75	0.235
Group 4	80	3293.88±331.62	443	3366.15±442.25	0.198

It was determined that 216 (41.30%) of the pregnant women included in the study had normal delivery and 307 (58.69%) delivered by cesarean section. The rates of cesarean section and normal delivery rates of patients with anemia in the third trimester were compared. There was no statistically significant difference observed between the delivery types and anemia (p=0.576). The comparison between the mode of delivery and anemia is shown in Table 4.

Table 4: The relationship between anemia and delivery type

	Normal vaginal delivery	Cesarean section	p
Anemia group	36	57	
Non-anemia group	180	250	0.576
Total	216	307	

Discussion

Pregnancy is a physiological process, not a disease. However, anemia is commonly seen in pregnant women. In addition, anemia is a factor that may affect the worsening of the pregnancy experience. The study group comprised pregnant women who received iron supplements during pregnancy. Our results showed that the infant birth weight is not affected by anemia. It could be postulated that regular follow-up and iron supplementation may prevent the fetus from being affected by anemia.

When the etiology of anemia is examined, physiological anemia due to hemodilution may occur in pregnant women. Additionally, adolescent pregnancies, frequent pregnancies, low socioeconomic status, multiparity, a history of iron deficiency anemia, chronic blood loss, parasitic diseases, malnutrition, black race, hemoglobinopathies and bleeding disorders increase the risk of anemia (5).

Several studies worldwide have focused on the maternal anemia. In a study conducted in China, the prevalence of anemia in pregnant women was reported as 14% (6). In Australia, this rate is 25% (3). It has been reported as 8.8% in the United States (7). There are many studies on the prevalence of anemia in pregnant women in Turkiye. In a study conducted in Tokat, the prevalence of anemia was reported as 23.5% (8). It was reported as 13.5% in pregnant women in Akyurt region, Ankara and 23.3% in Şanlıurfa (9-10). The prevalence of anemia in the 1st,

2nd, 3rd trimesters of the pregnant women included in the study was determined as 13%, 23.32% and 17.7%, respectively. In addition to these, findings of the present study showed that maternal anemia is still a common problem in Rize Studies on the effect of anemia on perinatal outcomes have yielded conflicting results. It is generally accepted that anemia has negative effects on pregnant women and newborns (11). It has been reported that maternal anemia increases the risk of mortality (12). It has been shown that the risk of preterm labor and small for gestationale age (SGA) births increases in pregnant women with anemia (13). In another study, it was reported that anemia increased the risk of preterm labor but did not change the risk of SGA (14). Another study reported that severe anemia was associated with preterm labor and SGA (15). In two different studies conducted also in Turkiye, it has been shown that anemia has no effect on infant birth weight (16-17).

In the present study, it was found that maternal anemia is still prevalent in Rize. The data we obtained in our study show that anemia in any trimester of pregnancy has no effect on infant birth weight. In addition, no relationship was found between the mode of delivery and anemia status. However, the pregnant women included in the study were those who were followed up in our clinic throughout their pregnancy. This may have resulted in the fact that these pregnant women received regular iron supplementation and were closely followed up. In this way, it may have been possible to protect babies from the negative effects of anemia.

Conclusıon

Anemia is a common condition that complicates pregnancy. It is still common in Rize. The data in our study showed that anemia did not affect infant birth weight. However, considering that the pregnant women included in the study were followed up regularly in RTEUTRH. We want to emphasize the importance of regular follow-up of the pregnant women and iron supplementation. In this way, the fetal and maternal effects of anemia can be prevented before they occur.

Ethics Approval: Approval for the study was obtained from the ethics committee of Recep Tayyip Erdogan University (decision no: 2022/188).

Conflict of Interest: The authors have no conflict of interest regarding this study.

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