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Evaluation of the effect of anemia on the birth weight of the baby during pregnancy

Burcu Kayhan Tetik¹, Ebru Inci Coskun²

¹Inonu University, Faculty of Medicine, Department of Family Medicine, Malatya, Turkey

²Inonu University, Faculty of Medicine, Department of Obstetrics and Gynecology, Malatya, Turkey

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Abstract

The aim of this study is to evaluate the impact of anemia on quality of life of mothers with without anemia on birth weight of the babies during pregnancy. The socio-demographic characteristics and complete blood counts of the patients who admitted to the pregnancy outpatient clinic were included in the study and data obtained from the files registered in the automation system. Evaluation of the data was performed by using software SPSS version 22. The mean Hb value was 11.650 ± 1.4 g / dL. Anemia was determined in 34 pregnant women (48.6%). In periodic follow up visits the mean weight of babies was 3325 g in the group without anemia and 2950 g in the group with anemia, the difference was statistically significant ($p < 0.001$). our study showed the birth weight of the infants was found to be lower in the anemic group. For this reason, complete blood count should be performed and if necessary, iron supplement should be initiated during routine controls of mothers during pregnancy.

Keywords: Anemia, pregnant, baby birth weight

Introduction

Pregnancy is a special process that the nutritional requirements of the productive woman have been increased. The probability of iron deficiency increases during pregnancy because the requirements of proteins, vitamins, minerals and iron are particularly high in term of life. In addition, the hemoglobin and hematocrit levels show differences depending on age and gender; a hemoglobin level lower than 12 g / dL in any women and 11 g / dL in pregnant women is accepted to indicate anemia [1]. In the literature the prevalence of anemia in pregnant women around the world has been found to vary between 15% and 40% [2,3]. World Health Organization has declared the proportion of anemia as 41.8% in the world and 20.1% in Turkey [4,5]. Anemia in pregnancy has been associated with intrauterine growth restriction (IUGR), preterm delivery, low birth weight (SGA), and even maternal death [6,7]. However, in literature, there have also been trials suggesting that anemia does not cause any complications [8]. The aim of this study is to evaluate the effects of maternal anemia and quality of life of anemic and non-anemic mothers on the birth weight.

Material and Methods

Study protocol

This study is planned to be a retrospective descriptive study. The ethical approval of Inonu University has been obtained. The files of the pregnant women who admitted to the pregnancy outpatient clinic of Inonu University Turgut Ozal Medical Center Hospital between January and December 2017 have been examined the automation system and the patients were contacted by telephone when necessary. The pregnant women between the ages of 18 and 40 who have not had any chronic disease or bleeding due to obstetric or gastrointestinal cause were included in the study. Socio-demographic characteristics, complete blood count values, follow-up frequency and baby birth weights were examined. Hemoglobin (Hb) level below 11 g/dL was accepted to indicate anemia, as recommended by Center for Disease Control [9]. But since these values are anemia values for normal individuals, we performed a literature review for gestational period. The majority of the studies have shown that values below 10 g / dL for 1 st and 3 rd trimesters and 11.0 g/dL for 2 nd trimester were accepted as anemia. [10-12]. Patients who did not come for the periodic controls, who have a psychiatric disorder that disables the patient to understand the questions, who delivered baby in an out center, and who are younger than 18 years old and older than 40 years old are excluded from the study.

*Corresponding Author: Burcu Kayhan Tetik, Inonu University, Faculty of Medicine, Department of Family Medicine, Malatya, Turkey
E-mail: drburcukayhan@hotmail.com

Statistical analysis

Statistical evaluation of the data has been performed by using software IBM SPSS for Windows version 22.0. Arithmetic mean (X), $\pm$ Standard deviation (SD), median (min-max), minimum and maximum values are used for the description of the quantitative variables. Number (n) and percentage (%) are used for the description of qualitative variables. The normality test of the birth weight variable was performed by using the Shapiro-Wilk test. In order to determine presence of a statistically significant difference between the group variable categories (anemia / no anemia) in terms of birth weight variables, the Mann-Whitney U test was used. A value of $p \leq 0.05$, is accepted to be significant in all tests.

Results

A total of 70 pregnant women were included in the study. The patients were allocated into the groups according to trimesters and presence of anemia. The mean age of the pregnant women included in the study was 29 ± 4.7 years, mean weight was 72.5 ± 12.4 kg and the mean height was 163 ± 5.3 cm. Regarding occupational status, we observed that 51 (72.8 %) pregnant women were housewives, which consisted the most numbered group and 8 (11.4 %) pregnant women were working in a free sector job which consisted the least numbered group. The mean Hb value was 11.650 ± 1.4 g/dL. Anemia was detected in 34 pregnant women (48.6 %). Socio-demographic characteristics are listed in Table 1.

Table 1. Sociodemographic data in according to presence or absence of anemia

	With Anemia	Without Anemia	p
Occupation			
Housewife	24 (70.5 %)	27 (75.1 %)	0.972
Free sector	4 (11.8 %)	4 (11.1 %)	
White-collar	5 (14.8 %)	4 (11.1 %)	
Other	1 (2.9 %)	2.8 (1 %)	
Education			
No reading or writing	2 (5.8 %)	1 (2.7 %)	0.197
Elementary	6 (17.5 %)	6 (16.6 %)	
Junior high school	5 (14.6%)	3 (8.4 %)	
Hihg school	7 (20.5 %)	17 (47.3 %)	
University	14 (41.6 %)	9 (25.0 %)	
Number of children			
Primigravida	15 (44.12 %)	17 (47.2 %)	0.413
0-2	14 (41.18 %)	15 (41.6 %)	
3-7	5 (14.7 %)	3 (11.2 %)	
Gestational week			
0-13 weeks	3 (8.9 %)	4 (13.9 %)	0.587
14-27 weeks	10 (29.4 %)	13 (36.1 %)	
28 weeks and up	21 (61.7 %)	18 (50.0%)	
Total	34 (100)	36 (100)	

Three pregnant women in the anemia group and 3 in the non anemia group were smokers and they were smoking less than 5 cigarettes in a day ($p= 1.00$); the difference between the groups was not statistically significant ($p = 0.368$). There were no poor perinatal results in their other pregnancies. We found that 18 (15.5%) pregnant women had admitted 9 and more times for control and 3 (5.3%) pregnant women had admitted less than 3 times, in the anemia group and 14 (16.5%) pregnant women had admitted 9 or more times and 7 (6.2 %) pregnant women had admitted 4 or 6 times, in the non anemia group. The difference between the groups was not statistically significant ($p = 0.374$). Regarding regular medications, we found that,17 (17.5%) pregnant women in the anemia group and 19 (18.5 %)pregnant women in the non anemia group were using medicine regularly; the difference was not statistically significant ($p= 1.00$). We found that, 23 (16.5 %) pregnant women in the anemia group and 11 (17.5 %) pregnant women in the non anemia group were using medicine including iron, regularly; the difference was statistically significant. ($p = 0.005$). Thirty (46.2 %) pregnant women in the anemia group and 35 (53.8 %) pregnant women in the non anemia group stated that they were attentive about their nutrition during pregnancy; the difference was not statistically significant ($p = 0.192$). In periodic follow up visits the mean weight of babies was 3325 gr in the non anemia group and 2950 gr in the anemia group; the difference was statistically significant ($p<0.001$).

Discussion

Anemia is a very important problem for women, especially for the pregnant women. Anemia during pregnancy affects maternal quality of life and causes important complications, such as preterm labor and intrauterine growth retardation, that affect the baby. It has been reported that 20% of the maternal death, worldwide, is caused by anemia [13]. Sak et al. found that the pregnant women with anemia were more likely to have preterm delivery and more babies needed neonatal intensive care, but this difference was not statistically significant [14]. Dündar at al. in their study, found that babies of the women with second trimester anemia had more oligohydramnios; the difference was statistically significant [15]. Bondewik et al. found that the mean birth weight in the anemia group was lower [16]. In a study conducted in Nigeria, the mean Hb level was found to be 10.2 g \ dL [17]. Studies in our country have found values between 11.9 and 12.2 g \ dL [18,19]. In our study, similar to the literature the average Hb value of the pregnant women was 11.6 g \ dL.

In the studies conducted abroad exploring the relationship between gestational week and anemia, anemia has been found to increase as gestational week increases [2,20]. Similarly, in our study, we found that the frequency of anemia increased as the gestational week increased. In our study, similar to the literature, the frequency of anemia was found to increase as the gestational week increased. Anemia during pregnancy is associated with dilutional anemia resulted from 50% increased cardiac output of the mother, occurred to provide sufficient placental blood flow for the baby. Another reason may be the increase of baby's consumption of iron and minerals from her mother to grow faster, especially during the last trimester.

Ayyildiz et al. in their study on adolescent pregnant women found the average infant weight to be 3200 g [16]. In our study,

the average infantile weight was 3325 g in non-anemia group. In our study, birth weight was found to be statistically significantly lower in the anemia group. This result is thought to be due to the decrease of the mother's appetite for food due to anemia and the inability to meet the increasing iron requirement. Sure the maternal anemia is one of the reasons that diminishes the quality of life and can cause dispnea, headache and tiredness. These all situations could also affect the puerperium term of the mother who would like to take care of her own baby by her healthy status.

Anemia and fatigue are the most common complaints of pregnant women especially in the last trimester [21-23]. Adverse clinical outcomes include increased risk of gestational hypertensive disorders, glucose intolerance, preterm delivery, and postpartum depression [24-26]. These complications may affect both the mother and the infant in both short and long term.

Pregnancy is a special process that the nutritional requirements of the woman are increased. The probability of iron deficiency increases because the need for proteins, vitamins, minerals, and iron increases especially during pregnancy.

There are studies in the literature that reports a positive correlation between the number of pregnancies and anemia [15,27]. But there are other studies that suggest that there is no relation between anemia and pregnancy number [18]. In our study, there was no relation between anemia and the number of pregnancies, similar to the study of Piriñçi et al. We think anemia is not related with the number of pregnancies but rather related with the duration between the pregnancies.

In the literature, no relationship between anemia and educational level was reported [28,29]. Alp et al. found that the level of anemia increased as the level of education decreased [30]. On the contrary, in our study, we found that the frequency of anemia increased as the level of education increased. But this increase was not statistically significant.

Conclusion

We found that the birth weight of the babies was lower in the anemia group. Anemia in pregnancy can cause complications for both the baby and the mother. For this reason, we think that early diagnosis of anemia and early initiation of the treatment, during follow-up of the pregnant women, providing education of nutrition recommending consumption of iron containing foods, and prescribing iron-containing preparations, that should be used from the 4th month of gestation.

Competing interests

The authors declare that they have no competing interest.

Financial Disclosure

The financial support for this study was provided by the investigators themselves.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication, double publication and/or submission, redundancy, etc.) have been completely checked by the authors.

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