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A Descriptive Study of Data from the Obstetrics Department at Al-Wahda Hospital, Derna: The Impact of Age on Laboratory Parameters and Anemia Prevalence in Postpartum Women

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ABSTRACT

This study investigated the relationship between age and laboratory test results (White Blood Cell count, Platelet count, and Hemoglobin levels) in women who recently gave birth. The study included 80 women, divided into two age groups: 18-30 years and 31-41 years. Data were collected from the obstetrics department at Al-Wahda Hospital in Derna between September and November 2024. The results showed a significant difference in the mean age between the two groups, with the 31-41 age group having a significantly higher average age than the 18-30 age group. However, there were no significant differences in White Blood Cell count or Platelet count between the two groups. The study found that both age groups had hemoglobin levels below the normal range, indicating mild anemia, a common condition in the postpartum period. The findings suggest the need for focused interventions to address anemia, particularly iron deficiency, during the postpartum period.

1. INTRODUCTION

Globally, nearly two in every five pregnant women and one in every three non-pregnant women of reproductive age have anaemia globally. (stevensGA et al., 2013). While the gaps in the prevalence of anaemia between subgroups are generally becoming smaller, such as gaps between the poorest and richest quintiles, the situation will be reversed in some countries, meaning that the better-off groups, such as the richer, urban and more educated women of reproductive age, may have a higher prevalence of anaemia in 2025. These findings show that inequalities in the prevalence of anaemia are not the only driver of this anaemia burden.

Among the key factors driving the high burden of anaemia are genetic disorders, frequent illness due to infectious diseases, unavailability of food, low intake of nutrient-rich foods and poor health-care services (WHO, 2012؛ PWHO, 2017). Clinically, it is classified as mild, moderate, or severe based on Hb concentrations, the cutoffs being dependent on age, sex, and physiological state. The reduction in Hb levels that characterizes anemia limits blood oxygen transport, making it insufficient to meet the body's physiologic needs. (WHO, 2011). In WRA, anemia results in fatigue, dizziness, reduced work capacity, loss of productivity, and increased susceptibility to infections. (Brabin et al., 2001; Mawani et al., 2016; WHO, 2014). Anemia can also commonly be caused by physical pathologies, including acute and chronic inflammation and hematological disorders (McLean et al., 2009; Tomkins, 2023). During 2000–2018, the prevalence of anaemia in women of reproductive age decreased in nine countries, with the highest decrease in Malawi (−2.5%), and increased in six countries, with the highest increase in Burundi (10.9%). (Mei, J., etal,2024). For a non-pregnant woman, anaemia was defined as haemoglobin level < 12 g/dL and for a pregnant woman, anaemia was defined as haemoglobin level < 11 g/dL.See data repository for the sample selection procedure.(Hasan et al., 2022). Anaemia was significantly associated with preterm birth (P=0.037), low birth weight (P=0.009), intrauterine growth restriction (P=0.002) and postpartum heamorrhage (P=0.019).) Gimono et al., 2024). Routine supplementation of iron is strongly advised during pregnancy as most of pregnant women do not have adequate iron stores. WHO states that 38.2% of women in pregnancy suffer from anemia and about half of them suffer from IDA (WHO, 2015.V. iron sucrose is one of preparations which is associated with higher availability for erythropoiesis than that of other I.V. preparations like iron dextran (Cançado and Muñoz, 2011). Faulty feeding habits could be attributed to the occurrence of iron deficiency anemia among young adults. The most prevalent habits accustomed in this age group include changing the main meals for snacks, skipping breakfast, reducing the intake of fruits and vegetables, and the increasing consumption of sodas and high calorie foods (Estima., et al., 2009; Tora, 2010; Toral etal., 2006). The volume of plasma increases more than the red cell mass does, leading to a decrease in the Hb concentration in the blood, in spite of the increase in the total number of red cells. This decrease in Hb concentration reduces the viscosity of the blood and is thought to boost placental perfusion, providing better maternal-fetal gas and nutrient exchange (Baradwan et al., 2018). The primary objective of this study is to investigate the relationship between age and laboratory test results (White Blood Cell count (WBC), Platelet count (PLT), and Hemoglobin (HG) levels) in women who recently gave birth. Specifically, the study aims to compare the laboratory results between two age groups (18-30 and 31-41 years) and assess whether age has any significant impact on these parameters. Additionally, the study seeks to examine the prevalence of anemia among women of different age groups in the postpartum period and to evaluate the clinical significance of the findings in relation to normal reference values for these tests.

2. MATERIALS AND METHODS

Data for the study were collected from 80 women who recently gave birth in the obstetrics department at Al-Wahda Hospital in Derna, during the period from September 1, 2024, to November 30, 2024. The data were extracted from the labor admission records and included information on age, as well as the results of white blood cell count, platelet count, and hemoglobin levels. The ages of the women ranged from 18 to 41 years.

Results were tabulated as mean ± SE. Values were analyzed using SPSS software (version 23) by one-way Anova of variance between groups. F test was determined and the lowest of $p<0.05$ was considered significant

3. RESULT

The results of the study comparing the mean age between two age groups (18-30 and 31-41) of women who recently gave birth are summarized in the table 1 and Figure 1. The total sample size consisted of 80 women, with 53 in the 18-30 age group and 27 in the 31-41 age group. The mean age for the 31-41 age group was found to be 34.14 ± 0.50 years, while for the 18-30 age group, the mean age was 23.62 ± 0.45 years. The overall mean age across both groups was 27.1750 ± 0.65 years. The F-test result showed a significant difference between the two groups, with a calculated F-value of 205.586, indicating a significant difference at $P < 0.05$. These findings suggest a clear and statistically significant difference in the mean age between the two groups of women who recently gave birth.

The results from Table 2 and Figure 2,3,4 indicate that there were no significant differences between the two age groups (18-30 and 31-41) in terms of laboratory results (WBC, PLT, and HG) for women who recently gave birth. For White Blood Cells (WBC),

the mean values were 10.97 ± 0.81 for the 31-41 age group and 10.86 ± 0.50 for the 18-30 age group, with an F-value of 0.014, suggesting no significant difference ($p > 0.05$). Similarly, for Platelets (PLT), the mean values were 252.62 ± 20.60 for the 31-41 group and 282.28 ± 14.01 for the 18-30 group, with an F-value of 1.461, again showing no significant difference ($p > 0.05$). Regarding Hemoglobin (HG), the 31-41 group had a mean of 8.75 ± 0.13, and the 18-30 group had 8.39 ± 0.16, with an F-value of 1.576, indicating no significant difference ($p > 0.05$).

When comparing these results with the normal reference values for these laboratory tests, the WBC counts in both groups (10.97 and 10.86) are slightly elevated compared to the normal range for adults, which is typically around **4,000 to** 11,000 cells per microliter of blood.

However, these values are still within the clinically acceptable range and do not indicate any abnormality. For Platelets (PLT), the normal range is typically between 150,000 and 450,000 platelets per microliter of blood.

The PLT values in both groups (252.62 and 282.28) fall within the normal range, suggesting no platelet-related abnormalities in either group. As for Hemoglobin (HG), the normal levels for women generally range between 12 to 16 grams per deciliter. The mean hemoglobin values of 8.75 and 8.39 for the two age groups are below the normal range, indicating mild anemia. This suggests that women in both age groups may be experiencing low hemoglobin levels, which is a common condition post-delivery, but it is worth noting that these values are still within the mild range and may be influenced by postpartum factors. In conclusion, while there are no significant differences between the two age groups in terms of WBC, PLT, and HG, the hemoglobin levels are below the normal range, which could indicate a common postpartum condition of anemia. However, the platelet and WBC counts appear to be within normal limits

4. DISCUSSION

The results of this study demonstrate the relationship between age and laboratory test results, specifically White Blood Cell (WBC) count, Platelet (PLT) count, and Hemoglobin (HG) levels, in women who have recently given birth. The findings indicated no significant differences in WBC, PLT, and HG levels between the two age groups (18-30 and 31-41 years). However, both age groups exhibited hemoglobin levels below the normal range, suggesting a common postpartum condition known as anemia. This aligns with previous studies indicating that postpartum anemia often results from blood loss during delivery or nutritional deficiencies, particularly iron deficiency (Brabin et al., 2001; WHO, 2012). Regarding WBC and PLT counts, values for both age groups fell within the normal clinical range, indicating no abnormalities in immune function or platelet aggregation. Specifically, WBC counts were 10.97 ± 0.81 for the 31-41 age group and 10.86 ± 0.50 for the 18-30 age group, both within the normal adult range of 4,000 to 11,000 cells per microliter of blood (WHO, 2012). Similarly, the PLT values were 252.62 ± 20.60 for the 31-41 age group and 282.28 ± 14.01 for the 18-30 age group, which are also within the clinically acceptable range of 150,000 to 450,000 platelets per microliter of blood, indicating no abnormalities in platelet function (WHO, 2017). However, both age groups had hemoglobin levels lower than the normal reference range for women, typically between 12 to 16 grams per deciliter. Specifically, the mean hemoglobin levels were 8.75 ± 0.13 for the 31-41 age group and 8.39 ± 0.16 for the 18-30 age group, indicating mild anemia (WHO, 2011). This finding is consistent with previous research that shows anemia is common among women of reproductive age, especially postpartum women (Mawani et al., 2016). Anemia can result from various factors, including nutritional deficiencies, blood loss during delivery, and inadequate postpartum care (Tomkins, 2023). The study also highlights the global prevalence of anemia among women of reproductive age, as reported by the WHO, where nearly two in every five pregnant women and one in every three non-pregnant women of reproductive age are affected by this condition (Stevens et al., 2013). In some regions, there is an increasing prevalence of anemia among higher socioeconomic groups, likely due to poor dietary habits, lack of access to proper nutrition, and inadequate healthcare (WHO, 2012). Furthermore, iron deficiency anemia is particularly common among pregnant and postpartum women, who often do not have adequate iron stores (WHO, 2015). This aligns with the study's findings of mild anemia in both age groups. The lack of significant differences in laboratory results between the two age groups suggests that age may not be a primary factor influencing WBC and PLT counts in postpartum women. However, the low hemoglobin levels observed in both groups emphasize the need for proper nutritional interventions, particularly iron supplementation, to prevent or address anemia during the postpartum period (WHO, 2011). Routine iron supplementation is strongly recommended, as many pregnant women do not possess sufficient iron stores to meet the demands of pregnancy and postpartum recovery (Gimono et al., 2024). In conclusion, while the WBC and PLT counts were within normal limits, the hemoglobin levels were below the normal range, indicating a common postpartum condition of anemia.

These findings underscore the need for increased awareness and intervention regarding anemia in postpartum women, particularly in low-income settings where iron deficiency is prevalent (McLean et al., 2009). Further studies focusing on the impact of nutritional interventions and iron supplementation on postpartum anemia could provide valuable insights into improving maternal health outcomes. The study also found a statistically significant difference in the mean age between the two groups of women who recently gave birth. The 31-41 age group had a mean age of 34.14 ± 0.50 years, while the 18-30 age group had a mean age of 23.62 ± 0.45 years.

The calculated F-value of 205.586 and a p-value of less than 0.05 indicate that this difference is statistically significant, meaning that age plays a key role in differentiating these two groups. This finding is consistent with global trends showing a shift in the average age of childbirth. In many regions, there has been an increasing trend of women giving birth at older ages, reflecting changes in social, economic, and healthcare conditions, such as delayed marriage, increased educational opportunities, and career development (Stevens et al., 2013). The significant difference in the mean age between the two groups in this study may also reflect these societal trends, with younger women in the 18-30 group potentially having better access to prenatal care and healthier pregnancies compared to women in the 31-41 age group, who may face higher risks during pregnancy, including anemia and other health complications (WHO, 2012). As women age, especially during pregnancy and the postpartum period, the complexities of their health needs become increasingly pronounced.

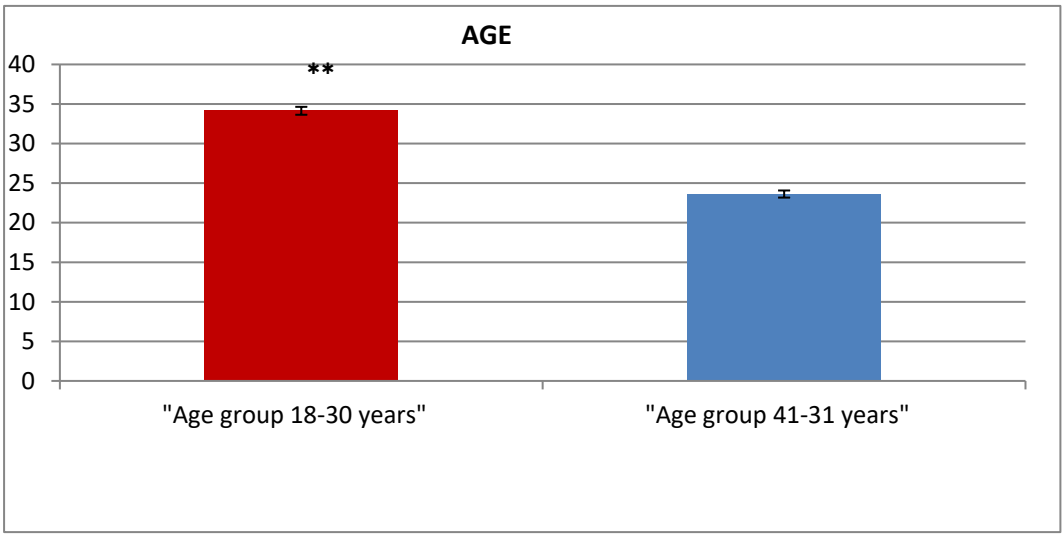

Figure (1) Comparison of Mean Age Between Age Groups (18-30 and 31-41) of Women Who Recently Gave Birth**.**
Each result represent the mean± SE; ** means significant at P<0.05

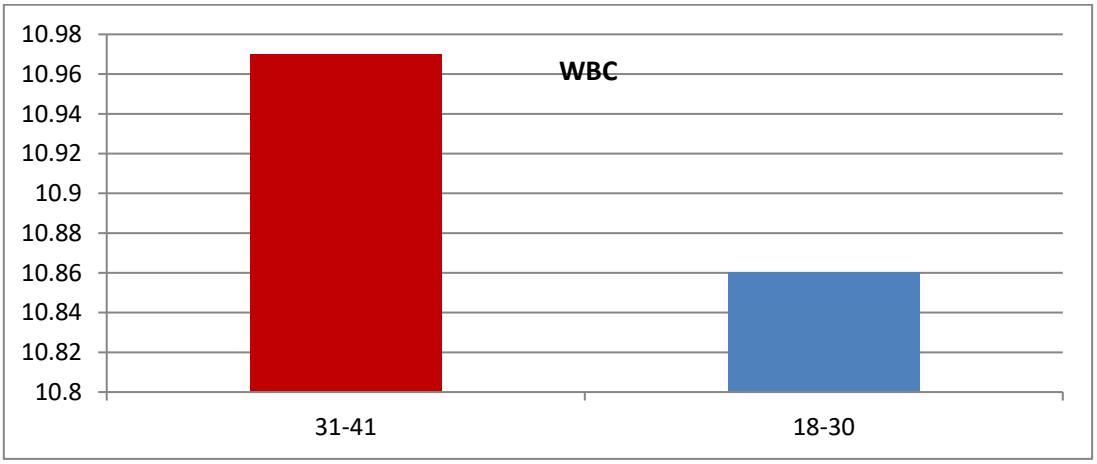

Figure (2) Comparison of Mean WBC Between Age Groups (18-30 and 31-41) of Women Who Recently Gave Birth**.**
Each result represent the mean± SE. Each result represent the mean± SE; ** means significant at P<0.05

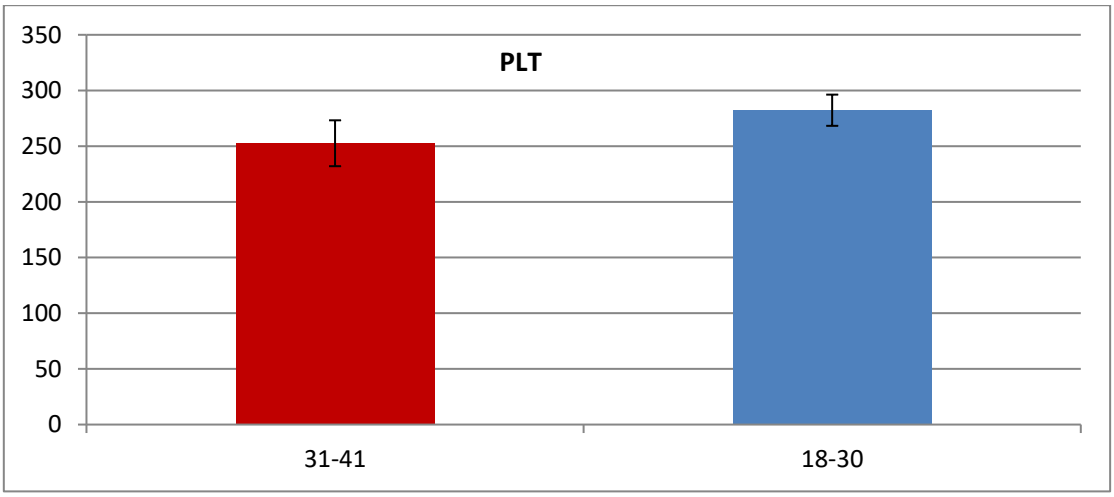

Figure (3) Comparison of Mean PLT Between Age Groups (18-30 and 31-41) of Women Who Recently Gave Birth**.** Each result represent the mean± SE. Each result represent the mean± SE; ** means significant at P<0.05

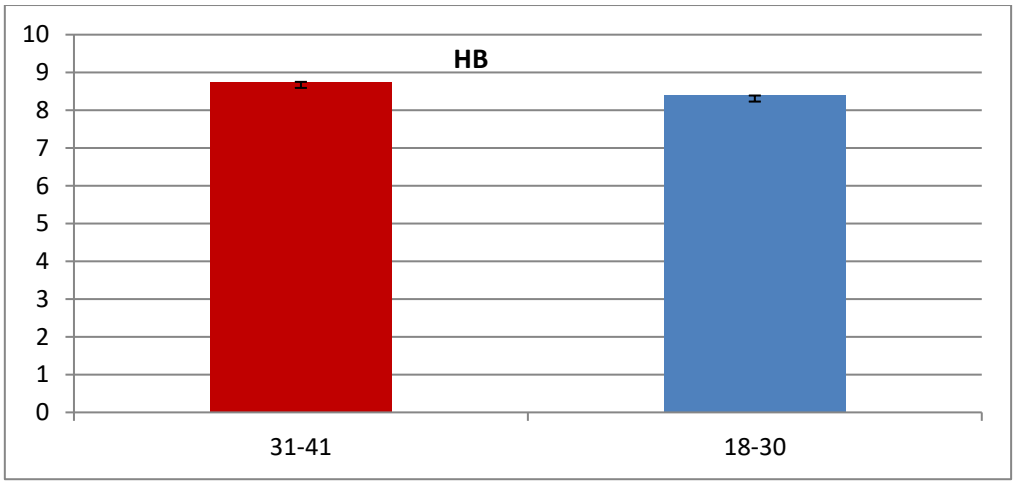

Figure (4): Comparison of Mean HB Between Age Groups (18-30 and 31-41) of Women Who Recently Gave Birth**.** Each result represent the mean± SE; ** means significant at P<0.05

Each result represent the mean± SE. Each result represent the mean± SE; ** means significant at P<0.05

Table.1.Comparison of Mean Age Between Age Groups (18-30 and 31-41) of Women Who Recently Gave Birth Using F-Test

Groups	18-30	31-41	Total	F- test
N	53	27	80	205.586
Mean± of age	23.62±0.45**	34.14±0.50**	27.1750±0.65	

Each result represent the mean± SE. Each result represent the mean± SE; ** means significant at P<0.05. Abbreviation; WBC, White Blood Cells; PLT,Platelets; HG, Hemoglobin

Table.2 Comparison of Laboratory Results (WBC, PLT, and Hemoglobin) Between Age Groups (18-30 and 31-41) of Women Who Recently Gave Birth Using F-Test

Groups	18-30	31-41	F- test
WBC	10.86±0.50	10.97±0.81	0.014
PLT	282.28±14.01	252.62±20.60	1.461
HG	8.3887± 0.16	8.75± .13	1.576

5. CONCLUSION

This study highlighted that while age did not significantly affect White Blood Cell (WBC) and Platelet (PLT) counts in postpartum women, both age groups showed mild anemia with hemoglobin levels below the normal range. The findings underline the importance of addressing anemia, particularly iron deficiency, during the postpartum period. Further interventions and research are needed to improve maternal health outcomes, focusing on nutrition and proper care.

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