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**A correlation between pregnant women's complete blood counts at various stages of pregnancy in Souq Al-Khamis/Al-Khums Hospital-February–may 2023**

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**Abstract:**

Malnutrition, exhausting work, multiple pregnancies, and close-to-term births are among the factors that commonly cause changes in pregnant women's blood images in Libya, where it is thought to be one of the main causes of pregnant women being hospitalized in the obstetrics and gynecology department at Souq Al-Khamis/Al-Khums Hospital. The goal of the current investigation was to pinpoint the modifications. Results of the blood components of pregnant women who visited Souq Al-Khamis/Al-Khums Hospital during the period (Feb-May 2023) revealed that there was a drop in blood cells and a considerable increase in platelet PLTs (0.05 P) and hemoglobin (0.05 P). White blood cells also decreased (0.05 P) along with red blood cells. Fifty one (cases) were examined complete blood count CBC pictures in pregnant women and compare them to the other studies worldwide. The SPSS statistical package was utilized to examine and evaluate the result

**Keywords**: Pregnant , Hemoglobin , RBC , WBC ,Blood components .

1. **Introduction**

The adaptation of the body to the demands and needs of the fetus, as well as the achievement of a balance between food inputs and maternal reserves, describe pregnancy as a period of significant physiological changes[1]. Pregnant women experience numerous internal metabolic and hormonal changes that control how the body's metabolic functions. [2]In a way that satisfies pregnancy's physiological requirements, including the fetus's requirements for growth and development up until birth [3]. Pregnancy is a natural process that alters the proportions of some blood components, such as the concentration of hemoglobin and the number of white and red cells, in addition to the effect of pregnancy on some chemical components. [4] In addition to the effect of pregnancy on some chemical components present in blood, it is a natural process that results in changes in the proportions of some blood components, such as the concentration of hemoglobin and the number of white and red cells. Additionally, the total volume of blood increases during pregnancy by roughly 30% of the normal volume, which is necessary to prepare the blood of the new tissues. [5]The size of the uterus can grow by up to 50% during pregnancy compared to its pre-pregnancy size[5]. The volume of plasma increases around three times faster than the volume of red blood cells, in addition to an increase in hemoglobin content and overall red blood cell size[5]. The major purpose for reasons plasma during pregnancy is to keep blood dynamics stable and the blood's ability to transport nutrients to the fetus[6]. After the eight week of delivery, the total number of red blood cells continues to rise [7]. The existence of some essential components is a need for the production of hemoglobin[7]. This component is made up primarily of iron, whose shortage, along with a lack of vitamin B12, is one of the leading causes of blood illnesses that arise from dietary deficiencies both before and during pregnancy. As the pregnancy progresses and continues until delivery, its state gets worse in the absence of treatment and compensation. [8] A woman whose hemoglobin level is less than 11 g/100 ml What causes the red blood value in order to be expressed as a value is the differences between the rise in blood fluids and the cellular components. [9] However, this difference is accompanied by smaller amount of the nutrients needed to produce red blood cells, which results in anemia [10] As a result total blood volume increases during pregnancy in order to prepare the blood for new tissues [11]. It is crucial to study blood components such as hemoglobin concentration, the number of white blood cells and red blood cells, and the size of red blood cells and platelets[11]. An umbilical cord complete blood count can provide this information. After birth, will be linked to long-term alterations in the person's metabolic processes [12].Objectives of the study to track changes in complete blood counts among pregnant patients at Souq Al-Khamis/Al-Khums Hospital throughout all stages of their pregnancies.to what extent it is helpful in defining therapeutic approaches, the mother's blood normal levels that which protect her from getting different blood illnesses, and additional requirements the fetus needs**.**

1. **Materials and methods**

The purpose of the analysis and providing relevant background information. Mention the source of the blood samples (e.g., patient population, collection method). Describe the equipment or device used for the CBC analysis (e.g., Sysmex KX-21N) and any specific procedures followed. Outline the parameters measured, such as hemoglobin, white blood cell count, platelet count, etc. Include details on the sample collection, preparation, and analysis techniques employed. Present the findings of the CBC analysis in a clear and organized manner. Display the numerical values obtained for each parameter measured (e.g., red blood cell count, hemoglobin concentration) along with their respective units of measurement. Use tables, charts, or graphs to enhance the readability of the results. Provide the established reference ranges for each parameter measured. Clearly indicate whether each result falls within the normal range or deviates from it. Analyze and interpret the CBC results based on the context of the study or the patient's condition. Discuss any significant findings or abnormalities observed. Relate the results to potential clinical implications or relevant medical conditions. Elaborate on the significance of the CBC analysis findings. Compare the results with existing literature or reference values. Address any limitations or factors that may have influenced the results. Emphasize any important clinical implications or potential areas for further investigation.

1. **Results and discussion**

**Table 1** The correlation of the complete blood count with age

|  | | Age | HB | WBC | RBC | HCT | PLA |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age | Pearson Correlation | 1 | .170\* | -.526\*\* | .050 | .044 | .398\*\* |
| Sig. (2-tailed) |  | .049 | .000 | .563 | .613 | .000 |
| N | 135 | 135 | 135 | 135 | 135 | 135 |
| HB | Pearson Correlation | .170\* | 1 | -.207\* | .423\*\* | -.241\*\* | .027 |
| Sig. (2-tailed) | .049 |  | .016 | .000 | .005 | .758 |
| N | 135 | 135 | 135 | 135 | 135 | 135 |
| WBC | Pearson Correlation | -.526\*\* | -.207\* | 1 | -.094 | .120 | -.051 |
| Sig. (2-tailed) | .000 | .016 |  | .280 | .164 | .554 |
| N | 135 | 135 | 135 | 135 | 135 | 135 |
| RBC | Pearson Correlation | .050 | .423\*\* | -.094 | 1 | -.378\*\* | -.022 |
| Sig. (2-tailed) | .563 | .000 | .280 |  | .000 | .803 |
| N | 135 | 135 | 135 | 135 | 135 | 135 |
| HCT | Pearson Correlation | .044 | -.241\*\* | .120 | -.378\*\* | 1 | -.043 |
| Sig. (2-tailed) | .613 | .005 | .164 | .000 |  | .621 |
| N | 135 | 135 | 135 | 135 | 135 | 135 |
| PLA | Pearson Correlation | .398\*\* | .027 | -.051 | -.022 | -.043 | 1 |
| Sig. (2-tailed) | .000 | .758 | .554 | .803 | .621 |  |
| N | 135 | 135 | 135 | 135 | 135 | 135 |

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed)

In this study, the results of Table (1) demonstrated a positive correlation between age hemoglobin levels and platelet count. In contrast, a negative correlation was found between age and white blood cell count. This study is in agreement with (Al-Khafaji), who found a negative correlation between hemoglobin and red blood cells, which is consistent with findings from other studies by Maclcan and colleagues, Iwatani and colleagues, and Jouse. The explanation is that the increase in white blood cell count is due to changes in the concentration of estrogen and cortisol hormones, which directly affect the proliferation of white cells. This increase reaches its peak during childbirth and returns to normal levels after six weeks postpartum. This study also aligns with a study by the World Health Organization in 2008, which indicates that the cause may be related to eating disorders and inadequate iron intake in the diet of pregnant women, as the fetus requires essential nutrients. Additionally, a study by (Mohamed Qais Al-Ani, University of Anbar) showed that the decrease in hemoglobin levels in pregnant women is attributed to a decrease in blood volume and the additional demands of the fetus. Similarly, the decrease in red blood cell count, as reflected by the value of P.C.V (%), is attributed to a discrepancy in the increase of blood fluids compared to cellular components. There is a positive correlation between hemoglobin and white blood cells and hematocrit and a negative correlation between hematocrit and red blood cells. The impact of anemia on red blood cells, hematocrit, and hemoglobin is evident, as a decrease in red blood cells leads to a decrease in hematocrit and hemoglobin levels. These results are consistent with a previous study by (Al-Khafaji, 1995), which attributed this decrease to malnutrition, particularly iron deficiency, according to sources from the World Health Organization.

**4. Statistical analysis**

The (Spss17) program was used to statistically analyze the data in relation to the concept of P. value (measuring the level of significance seen through the research sample, which is the probability value for accepting the null hypothesis, for instance, the probability that there are no differences). If the P value was less than 0.05, it was considered statistically significant, while the other options were no correlation or statistically significant between the averages.

**5. Recommendations**

1. Due to the risks they pose to pregnant women, it is essential to consider changes in complete blood count (CBC) at all stages of pregnancy. Additionally, blood components must be constantly monitored and occasionally checked.
2. Providing pregnant ladies with healthy food.
3. Planning the pregnancy process at times which are appropriate for the body's health declining blood levels, and being aware
4. not to put the body under undue stress.

**6. Conclusion**

51 (cases) were used to examine complete blood CBC pictures in pregnant women and compare them to the other studies in the world**,** there was a drop in blood cells and a considerable increase in platelet PLTs (0.05 P) and hemoglobin (0.05 P). White blood cells also decreased (0.05 P) along with red blood cells.

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**العلاقة بين صور الدم الكاملة ( CBC ) للنساء الحوامل في مراحل الحمل المختلفة في** **مستشفى الخمس- سوق الخميس / فبراير – مايو 2023**

وفاء غريبة وأحمد القدار وفاطمة العبيدي وعادل مليطان وهدي القبي

**الملخص**

يعد سوء التغذية والعمل المرهق والحمل المتعدد والولادات في فترة قريبة من العوامل التي تسبب عادة تغيرات في صور دم النساء الحوامل في ليبيا، حيث يُعتقد أنه أحد الأسباب الرئيسية لدخول النساء الحوامل إلى المستشفى في قسم التوليد. وقسم النساء والولادة بمستشفى سوق الخميس/الخمس. كان الهدف من الدراسة هو معرفة نتائج مكونات الدم للحوامل الزائرات لمستشفى سوق الخميس/الخمس لفترة (فبراير- مايو 2023). تم استخدام 51 (حالة) لفحص صور الدم الكاملة CBC لدى النساء الحوامل ومقارنتها مع الدراسات الأخرى في العالم. وتم استخدام البرنامج الإحصائي SPSS لفحص وتقييم النتائج., وكشفت النتائج عن وجود انخفاض في خلايا الدم وزيادة كبيرة في الصفائح الدموية حيت كان PLTs (P 0.05)والهيموجلوبين (0.05 P). كما انخفضت خلايا الدم البيضاء (0.05 P) مع خلايا الدم الحمراء.