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PREGNANCY-INDUCED HAEMATOLOGICAL CHANGES: A KEY TO MARTERNAL AND CHILD HEALTH

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ABSTRACT
A crucial physiological process for human reproduction is pregnancy. The haematological changes that pregnancy brings about are crucial to the outcomes for maternal and child health and labor and delivery. In order to meet the needs of the fetoplacental unit, the pregnant mother experiences significant anatomical and physiological changes during pregnancy. In straightforward pregnancies, these alterations start to take place after conception and affect almost all organ systems. However, they end after delivery with only minor aftereffects. The most important of these hematopoietic changes are physiologic anemia, neutrophilia, mild thrombocytopenia, increased procoagulant factors, and decreased fibrinolysis; these changes are frequently seen in the woman's plasma volume, red blood cells, white blood cells, platelets, and coagulation factors.

KEYWORDS: *conception, delivery outcomes, coagulation, plasma volume, haematological changes, pregnancy, foetus.*

INTRODUCTION
In order to meet the needs of the fetoplacental unit, the pregnant mother goes through significant anatomical and physiological changes.[1-4] Nearly every organ system is affected by these changes after conception, but in uncomplicated pregnancies, they resolve after delivery with little lasting impact.[5-8] The most significant of these haematological changes include physiologic anemia, neutrophilia, mild thrombocytopenia, increased procoagulant factors, and decreased fibrinolysis; these changes are frequently seen in the woman's plasma volume, red blood cells, white blood cells, platelets, and coagulation factors.[1, 9–12]

PREGNANCY AND PLASMA VOLUME CHANGES
The total gain in plasma volume at term averages 1100-1600 mL and results in a plasma volume of 4700-5200 mL, which is 30–50% higher than that found in nonpregnant women.[1] Plasma volume increases gradually throughout a normal pregnancy. By 34 weeks gestation, the majority of this increase happens, and it is proportional to the baby's birthweight.[1] The decrease in hemoglobin concentration, haematocrit, and red blood cell count that follows causes haemodilution because the expansion in plasma volume is frequently relatively greater than the increase in red cell mass.[13–16]

A PREGNANCY'S CHANGES IN RED CELL MASS
RBC mass starts to rise at 8–10 weeks of pregnancy and steadily rises by 20–30 percent (250–450 mL) above pre-pregnancy levels by the end of pregnancy in women taking iron supplements; however, this increase is only by 15-20 percent in women not taking iron supplements.[1]

The modest drop in hemoglobin levels seen in healthy pregnant women is due, as previously mentioned, to the greater expansion of plasma volume relative to the increase in haemoglobin mass and erythrocyte volume.[1]

THE CHANGES IN PLATELET COUNT DURING PREGNANCY
Although they typically stay within normal ranges, platelet counts tend to decline gradually during a typical pregnancy.[5] Gestational thrombocytopaenia is characterized by mild asymptomatic thrombocytopenia that usually develops in the third trimester in a patient who has never had thrombocytopaenia before (aside from during a previous pregnancy). postpartum resolves.[1]

WBC COUNT CHANGES DURING PREGNANCY
Leukocytosis during pregnancy is commonly brought on by an increase in neutrophil circulation. The neutrophil

count starts to rise in the second month of pregnancy and stabilizes in the second or third trimester. However, six days after childbirth, the white blood cell count returns to the normal non-pregnant range.[1]

The relative number of T and B lymphocytes does not change significantly in healthy pregnant women, nor does the absolute number of lymphocytes. The monocyte count is typically stable, but the basophil and eosinophil counts may slightly change. Additionally, a small number of myelocytes or metamyelocytes may be present in the peripheral circulation in healthy pregnant women.[1]

SYSTEM CHANGES IN COAGULATION DURING PREGNANCY

Pregnancy-related changes to the coagulation system result in a physiological hypercoagulable state. Certain clotting factors, in particular VIII, IX, and X, are more abundant, while endogenous anticoagulants like protein S and antithrombin are less abundant.[5] Factor V remains unchanged while fibrinogen levels rise significantly, up to 50%.[1] Fibrinolytic activity is also decreased. All of these modifications encourage clotting, making pregnant and postpartum women more susceptible to venous thrombosis. This elevated risk begins in the first trimester and lasts for at least 12 weeks after delivery.[5] Depending on the factor, different coagulation parameters normalize, but all should return to baseline by 8 weeks postpartum.[1] Most of the time, in vitro tests for coagulation—activated partial thromboplastin time (APTT), prothrombin time (PT), and thrombin time (TT)—remain normal in the absence of anticoagulants or a coagulopathy.[5]

CONCLUSION

The most significant of these haematological changes include physiologic anemia, neutrophilia, mild thrombocytopenia, increased procoagulant factors, and decreased fibrinolysis; these changes are frequently seen in the woman's plasma volume, red blood cells, white blood cells, platelets, and coagulation factors.

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