

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى

وَاللَّهُ خَلَقَكُمْ مِنْ تُرَابٍ ثُمَّ مِنْ نُطْفَةٍ ثُمَّ جَعَلَكُمْ أَزْوَاجًا وَمَا  
تَحْمِلُ مِنْ أُنْثَى وَلَا تَضَعُ إِلَّا بِعِلْمِهِ وَمَا يُعَمَّرُ مِنْ مُعَمَّرٍ وَلَا  
يُنْقَصُ مِنْ عُمْرِهِ إِلَّا فِي كِتَابٍ إِنَّ ذَلِكَ عَلَى اللَّهِ يَسِيرٌ

صدق الله العظيم

سورة فاطر الآية 11

# **Dedication**

**To those who always believe on my efforts...**

**To my lovely parents who have been my constant source of  
inspiration ....**

**To my brothers and sister for their understanding support ....**

**To all those who help me to proceed ahead ....**

## **Acknowledgment**

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## Abstract

This is a cross sectional descriptive analytical study carried out on Umbadda hospital and Alsuadi maternal hospital in the period from January 2011 to May 2011 to evaluate the complete blood count (CBC) and reticulocyte count in Sudanese anemic pregnant women. A total of 100 anemic pregnant women as study group and 50 pregnant women as control group aged from 15-40 years were selected.

Blood sample was collected randomly from each pregnant woman during different gestational age. 2.5ml venous blood was placed in K<sub>3</sub> EDTA containers for CBC which was performed using automated analyzer (sysmex KX 21N), thin blood film preparation and manual reticulocyte count.

52% of the pregnant ladies received iron treatment and 48% did not. They were studied also for chronic diseases as well as hematological changes.

The results were analyzed by Statistical Package for Social Science (SPSS version 14.0) program and the mean of each parameter were calculated. They were as followed:

The mean of RBCs count, HB and PCV were  $3.7 \times 10^6/\mu\text{l} \pm 0.6$ , 9 g/dl  $\pm 1.6$  and 27.7% $\pm 5$  respectively. The mean of MCV was  $73.8 \pm 9.2$ , MCH was  $24.4 \pm 3.4$  and MCHC was  $33 \pm 2.8$ . The mean of TWBCs count was  $8.3 \times 10^3/\mu\text{l} \pm 2.3$  and platelets was  $212 \times 10^3/\mu\text{l} \pm 65$ . All the parameters of the study group showed significant difference (P. value < 0.05) in compare with control group.

When the study group divided into 3 different trimesters, there was significant difference (P. value < 0.05) in the hematological parameters.

The study revealed that the morphological types of anemia in pregnant women were 52(52%) microcytic hypochromic, 37 (37%) normocytic normochromic and 11(11%) dimorphic picture. In the physiological classification based on RPI that reflect the bone marrow activity 91(91%) had ineffective erythropoiesis with RPI <2 and 9(9%) had effective erythropoiesis with RPI  $\geq 2$ .

The number of pregnancy showed significant effect on HB level in pregnant women while the chronic diseases showed insignificant effect on the level of HB.

With progress of program, there is tendency to anemia and increase RPI and microcytosis with hypochromasia. The cause of the anemia in this study is likely to be iron deficiency.

أجريت هذه الدراسة الوصفية التحليلية في مستشفى امبدة والمستشفى السعودي في الفترة من يناير 2011 إلى مايو 2011 للتقييم الكامل لخلايا الدم وعدد الخلايا الشبكية في النساء السودانيات الحوامل اللاتي يعانين من فقر الدم ، وتمت دراسة ما مجموعه 100 من النساء الحوامل اللاتي يعانين من فقر الدم كمجموعة الدراسة و 50 من النساء ذوات الحمل الطبيعي كمجموعة ضابطة اللاتي تتراوح أعمارهن بين 15-40 عاما. جمعت عينة الدم عشوائيا من كل النساء الحوامل خلال اعمار الحمل المختلفة ، وضعت 2.5 مل من الدم الوريدي في حاويات مانع التجلط EDTA K<sub>3</sub> وذلك لقياس الخلايا الذي قام به المحلل الآلي 21sysmex ولعمل مسحة الدم الرقيقة والعد اليدوي للخلايا الشبكية.

وجد ان 52 % من السيدات الحوامل تلقين العلاج بالحديد و 48 % لم تتلقين العلاج . و قد تمت دراسة الأمراض المزمنة وكذلك التغيرات بالنسبة لخلايا الدم .

و قد تم تحليل النتائج احصائيا بواسطة برنامج الحاسوب SPSS الاصدار 14.0 وكانت النتائج كالتالي : متوسط عدد كريات الدم الحمراء والهيموجلوبين وحجم تكدس الخلايا  $0.6 \pm 3.7$  و  $1.6 \pm 9$  و  $5 \pm 27.7$  على التوالي. وكان متوسط حجم الخلية  $9.2 \pm 73.8$  ومتوسط هيموجلوبين الخلية  $3.4 \pm 24.4$  ومتوسط تركيز هيموجلوبين الخلية  $2.8 \pm 33$  , وكان متوسط كريات الدم البيضاء  $2.3 \pm 8.3$  ومتوسط الصفائح الدموية  $65 \pm 212$  . و قد أظهرت كافة مؤشرات مجموعة الدراسة فروقا ذات دلالات احصائية ( قيمة  $P < 0.05$  ) في مقارنته مع المجموعة الضابطة . وكذلك عند تقسيم مجموعة الدراسة حسب فترات الحمل المختلفة أظهرت المؤشرات فروقا ذات دلالات احصائية ( قيمة  $P < 0.05$  ).

كانت انواع فقر الدم اعتمادا على شكل وحجم الخلية لدى النساء الحوامل المصابات بفقر الدم 52(52%) خلايا دقيقية ناقصة الصباغ , 37 (37%) خلايا سوية مكتملة الصباغ و 11(11%) خلايا ثنائية الصورة , اما بالنسبة للتصنيف الفيسيولوجي على اساس مؤشر انتاج الخلايا الشبكية الذي يعكس نشاط نخاع العظم 91(91%) لديهم معدل غير فعال لتكون الخلايا الحمراء مع مؤشر انتاج  $> 2$  و 9(9%) لديهم معدل تكون خلايا حمراء فعال مع مؤشر انتاج  $\leq 2$  .

اظهر تعدد الحمل تأثيرا كبيرا على مستوى الهيموجلوبين لدى النساء الحوامل في حين أن الأمراض المزمنة لم تظهر تأثيرا يذكر على مستوى الهيموجلوبين .

خلصت الدراسة الى انه مع تقدم الحمل ، هنالك اتجاه لفقر الدم وزيادة مؤشر انتاج الخلايا الشبكية مع صغر الكريات الحمراء ونقص الصباغ . سبب فقر الدم في هذه الدراسة من المحتمل أن يكون نقص الحديد.

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## **Abbreviations:-**

<b>AIP</b>	Acute intermittent porphyria
<b>CBC</b>	Complete blood count
<b>CO</b>	Cardiac output
<b>CRC</b>	Corrected Reticulocyte Count
<b>DNA</b>	Deoxyribonucleic acid
<b>EDTA</b>	Ethylene diamine tetra acitic acid
<b>G6PD</b>	Glucose 6 phosphate dehydrogenase
<b>HB</b>	Hemoglobin
<b>HiCN</b>	Cyanomethemoglobin
<b>MCH</b>	Mean cell hemoglobin
<b>MCHC</b>	Mean cell hemoglobin concentration
<b>MCV</b>	Mean cell volume
<b>O<sub>2</sub></b>	Oxygen
<b>PBP</b>	Peripheral blood picture
<b>PCV</b>	Packed cell volume
<b>PIH</b>	Pregnancy induced hypertension
<b>PLT</b>	Platelet
<b>PROM</b>	Premature rupture of membrane
<b>RBC<sub>s</sub></b>	Red blood cells
<b>RCM</b>	Red cell mass
<b>RPI</b>	Reticulocyte production index
<b>SD</b>	Standard deviation
<b>SUST</b>	Sudan University of Science and Technology

**UTI** Urinary tract infection.

**WBC<sub>s</sub>** White blood cells.