

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى

وَاللَّهُ خَلَقَكُمْ مِنْ تُرَابٍ ثُمَّ مِنْ نُطْفَةٍ ثُمَّ جَعَلَكُمْ أَرْوَاحًا وَمَا  
تَحْمِلُ مِنْ أَنْثَى وَلَا تَصْنَعُ إِلَّا يَعْلَمُهُ وَمَا يُعَمَّرُ مِنْ مُعَمَّرٍ وَلَا  
يُنْقَصُ مِنْ عُمُرِهِ 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  $K_3$  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 امدة والمستشفى السعودي في الفترة من يناير 2011 إلى مايو 2011 للتقييم الكامل لخلايا الدم وعدد الخلايا الشبكية في النساء السودانيات الحوامل الالاتي يعاني من فقر الدم ، وتمت دراسة ما مجموعه 100 من النساء الحوامل الالاتي يعاني من فقر الدم كمجموعه الدراسة و 50 من النساء ذوات الحمل الطبيعي كمجموعه ضابطة الالاتي تتراوح اعمارهن بين 15-40 عاما.

جمعت عينة الدم عشوائيا من كل النساء الحوامل خلال اعمار الحمل المختلفة ، وضفت 2.5 مل من الدم الوريدي في حاويات مانع التجلط K3 EDTA وذلك لقياس الخلايا الذي قام به المحل الآلي 21sysmex ولعمل مسحه الدم الرقيقه والعد اليدوي للخلايا الشبكية.

وقد ات 52 % من السيدات الحوامل تلقين العلاج بالحديد و 48 % لم تلقين العلاج . وقد تمت دراسة الأمراض المزمنة وكذلك التغيرات بالنسبة لخلايا الدم .

وقد تم تحليل النتائج احصائيا بواسطه برنامج الحاسوب SPSS الاصدار 14.0 وكانت النتائج كالتالي : متوسط عدد كريات الدم الحمراء والهيموجلوبين وحجم تكس الخلايا  $0.6 \pm 3.7$  و  $1.6 \pm 27.7$  و  $5 \pm 5$  على التوالي . وكان متوسط حجم الخلية  $9.2 \pm 73.8$  و متوسط هيموجلوبين الخلية  $3.4 \pm 24.4$  و متوسط تركيز هيموجلوبين الخلية  $2.8 \pm 33$  ، وكان متوسط كريات الدم البيضاء  $2.3 \pm 8.3$  و متوسط الصفائح الدموية  $65 \pm 212$  . وقد أظهرت كافة مؤشرات مجموعه الدراسة فروقا ذات دلالات احصائية ( قيمة  $P < 0.05$  ) في مقارنته مع المجموعه الضابطة . وكذلك عند تقسيم مجموعه 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%) خلايا دقيقه ناقصه الصياغ ، (37%) خلايا سويه مكتمله الصياغ و (11%) خلايا ثنائية الصوره ،اما بالنسبة للتصنيف الفيسيولوجي على اساس مؤشر انتاج الخلايا الشبكية الذي يعكس نشاط نخاع العظم (91%) لديهن معدل غير فعال لتكون الخلايا الحمراء مع مؤشر انتاج  $> 2$  و (9%) لديهن 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 ، هناك اتجاه لفقر الدم وزيادة مؤشر انتاج الخلايا الشبكية مع صغر الكريات الحمراء ونقص الصياغ . 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.

**WBCs** White blood cells.