



**Sudan University of Science and Technology**  
**College of Graduated Studies**



**Assessment of Complete Blood Count in Patients with**  
**Rheumatoid Arthritis in Khartoum State**

تقييم قياس الدم الكامل عند مرضي التهاب المفاصل الرثياني بولاية الخرطوم

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بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

قال تعالى:

يَا أَيُّهَا النَّاسُ اتَّقُوا رَبَّكُمُ الَّذِي خَلَقَكُمْ مِنْ نَفْسٍ وَاحِدَةٍ وَخَلَقَ مِنْهَا  
زَوْجَهَا وَبَثَّ مِنْهُمَا رِجَالًا كَثِيرًا وَنِسَاءً وَاتَّقُوا اللَّهَ الَّذِي تَسَاءَلُونَ  
بِهِ وَالْأَرْحَامَ إِنَّ اللَّهَ كَانَ عَلَيْكُمْ رَقِيبًا ﴿١﴾

صدق الله العظيم

سورة النساء الآية 1

## **DEDICATION**

I dedicate my dissertation research to my both families. A special feeling of gratitude to my loving parents, whose words of encouragement and push for tenacity ring in my ears. Also I dedicate this dissertation to my many colleagues who support me. I will always appreciate all they have done. I will never forget to give special thanks to my beloved husband for any things.

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## Abstract

This study aimed to detect the effect of rheumatoid arthritis disease on some blood parameter using complete blood count. Seventy chronic rheumatoid arthritis patient from Zain Medical Center were selected in this study. Thirty individuals controlled as control this study. A specimen of 2.5ml blood was collected from each volunteers in EDTA container. Automated hematological analyzer (sysmex Kx2IN) was used to measure the parameters. The result showed that in cases mean of CBC (Hb, WBCs, Rbcs, PCV, MCV, MCH, MCHC and platelets count) parameters in case group were ( $11.6 \pm 1.6$ mg/dl,  $6.9 \pm 2.4$ /cumm,  $4.4 \pm 0.5$ /cumm,  $36.7 \pm 4.5\%$ ,  $83.0 \pm 6.9$ /fl,  $26.0 \pm 2.8$ /pg,  $31.0 \pm 1.6$ mg/dl,  $325.2 \pm 106.8$ ) respectively, while the control group ( $13.2 \pm 1.1$ mg/dl,  $6.2 \pm 1.7$ /cumm,  $5.0 \pm 0.3$ /cumm,  $41.0 \pm 3.5\%$ ,  $82.4 \pm 3.0$ /fl,  $26.0 \pm 0.9$ /pg,  $31.6 \pm 2.2$  mg /dl,  $263.2 \pm 54.6$ ) respectively, *p value* were ( $P < 0.000$  significant,  $P < 0.165$  insignificant,  $P < 0,000$  significant,  $P < 0,000$  significant, *P.value* 0.573 in significant, *p.value*  $< 0.910$  in significant, *P.value*  $< 0.236$  in significant,  $P < 0.000$  which is significant, *P.value* 0.003. conclusion Chronic Rheumatoid Arthritis patients were at risk to develop anemia hemoglobin, red blood cell, packet cell volume of RA patients significantly decreased. There was no significant MCV, MCH, MCHC, and insignificantly

increased in TWBC indicating inflammation ,platelets increased significantly .significantly variation according to gender .the severity of anemia in female more than male,gender was not affected TWBC Count.

## ملخص الدراسة

هدفت هذه الدراسة للكشف عن تأثير التهاب المفاصل الروماتويدي علي بعض معلمات التعداد الكلي للدم .تم اختيار سبعون مريضا بالتهاب المفاصل الروماتويدي المزمّن بمركز زين الطبي وثلاثون تم اختيارهم كمجموعة ضبط.تم جمع 2.5 مل كعينة دم من كل مريض في حاوية دم بها مانع تجلط . محلل الدم سيسمكس استعمل لقياس المعلمات. اظهرت نتائج تعداد الدم الكلي لعينات المرضى متوسط الهيموقلوبين, خلايا الدم البيضاء,خلايا الدم الحمراء, وحجم خلايا الدم المضغوطة, متوسط حجم الخلية, متوسط الهيموقلوبين في الخلية, متوسط الهيموقلوبين في 100 مل من الخلايا الحمراء وعدد الصفائح الدموية ( $11.6 \pm 1.6 \text{ mg/dl}$ ,  $6.9 \pm 2.4 \text{ \cumm}$ ,  $4.4 \pm 0.5 \text{ \cumm}$ ,  $36.7 \pm 4.5\%$ ,  $83.0 \pm 6.9 \text{ fl}$ ,  $26.0 \pm 2.8 \text{ pg}$ ,  $31.0 \pm 1.1 \text{ pg}$ ,  $6.2 \pm 1.7 \text{ \cumm}$ ,  $5.0 \pm 0.3 \text{ \cumm}$ ,  $41.0 \pm 3.5\%$ ,  $82.4 \pm 3.0 \text{ fl}$ ,  $26.0 \pm 0.9 \text{ pg}$ ,  $31.6 \pm 2.2 \text{ mg/dl}$ ,  $263.2 \pm 54.6 \text{ \cumm}$ ) ( $p < 0.000$ ,  $p < 0.165$ ,  $p < 0.000$ ,  $p < 0.000$ ,  $p < 0.000$ ,  $p < 0.003$ ,  $p < 0.573$ ,  $p < 0.910$ ,  $p < 0.236$ ,  $p < 0.000$ ,  $p < 0.003$ ).

خلصت الدراسة ان هناك نقصان معتبر في كريات الدم الحمراء والهيموقلوبين والهيماتوكريت مقارنة بمجموعة الضبط ولا يوجد تغيير معتبر في متوسط حجم الخلية , متوسط الهيموقلوبين في الخلية , متوسط الهيموقلوبين في 100 مل من الخلايا الحمراء وزاد العدد الكلي لكريات الدم البيضاء زياده غير معتبره وهنالك زياده معتبره في عدد الصفائح الدموية. مرضي التهاب المفاصل الروماتويدي المزمّن معرضون لخطر الاصابه الانيميا . الانيميا كانت اكثر شدة في النساء مقترنة بالرجال .

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## List of Abbreviations

ACD	Anemia of chronic disease
ACPA	Anti-citrullinated protein antibody
Anti ccp	Anti circulated citrullin peptide
ANA	Anti-nuclear antibody
BFU-E	burst forming unit erythroid
B-cell	B lymphocyte
CD	cluster differentiation
CFU-E	colony forming unit erythrocyte
CLL	chronic lymphocytic leukemia
CBC	complete blood count
CO <sub>2</sub>	Carbon dioxide
ESR	erythrocyte sedimentation rate
EPO	erythropoietin hormone
EDTA	Ethylene diamine tetra acetic acid
ESA	Erythropoiesis stimulating agent
Fc	
GM-CSF	granulocyte macrophage colony stimulating factor
GSF	granulocyte colony stimulating factor
Hb	Hemoglobin