

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى :

(اللَّهُ الَّذِي خَلَقَكُمْ مِنْ ضَعْفٍ ثُمَّ جَعَلَ مِنْ بَعْدِ ضَعْفٍ قُوَّةً ثُمَّ جَعَلَ مِنْ بَعْدِ قُوَّةٍ

ضَعْفًا وَشَيْئَةً يَخْلُقُ مَا يَشَاءُ وَهُوَ الْعَلِيمُ الْقَدِيرُ)

سورة الروم الآية (54)

## **Dedication**

I dedicate this work to my father, who has taught me that diligence and perseverance are the keys to success.

To my mother who have begging Allah to give me the strength to go on studying with out hindrance.

To my brothers whom are found at the times of need.

To my Friends and colleagues all my teachers whom have shone of me the light to go for best.

## **Acknowledgment**

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## **Abstract**

This is a hospital based analytical descriptive cross sectional case-control study was conducted in Kidney Transplantation Association Hospital during period from 2 April 2012 to 10 May 2012 to determine the morphological patterns of anemia an iron status among chronic renal failure patients attending Kidney Transplantation Association Hospital.

Blood samples were collected under sterile condition from seventy patients with chronic renal failure as case group and thirty from healthy individuals as control group. The hematological parameters, serum iron and serum ferritin were measured using automated hematological analyzer machine (Sysmex KX 21) and (selectra XL). Data obtained were analyzed using soft ware program Statistical Package of Social Science (SPSS version 11.5). The results showed that the means of hemoglobin (8.5 g/dl), hematocrit ( 26.7%) and RBCs count ( $3.0 \times 10^6 / \mu\text{l}$ ) of case group were statistically significant low. The study showed that the frequency and percent of anemia among case group were anemic 69 (98.5%) mean Hb(8.4 g/dl) and remaining one case was non anemic with hemoglobin mean (12.0 g/dl). Also found the type of anemia among chronic renal failure patients was normocytic normochromic anemia 65(94.2%).

The study showed that there was statistically significant decrease ( $P < 0.05$ ) in the level of serum iron in chronic renal failure patients with the mean ( 63 $\mu\text{g/dl}$ ) when compared to the mean of control group with mean (96 $\mu\text{g/dl}$ ). The study showed that there was statistically significant increase( $P < 0.05$ ) in the level of serum ferritin in chronic renal failure patients with the mean (581 $\mu\text{g/l}$ ) when compared to the mean of control group with mean(72  $\mu\text{g/l}$ ).

## ملخص البحث

أجريت هذه الدراسة المقطعية التحليلية الوصفية (حالة وحالة ضابطة) بمستشفى جمعية زارعي الكلى السودانية خلال الفترة من الثاني من إبريل وحتى العاشر من مايو 2012 لتحديد أنماط فقر الدم وقياس مستوى الحديد بين مرضى الفشل الكلوي المزمن الذين يترددون على مستشفى جمعية زارعي الكلى. أخذت عينات الدم تحت ظروف معقمة من سبعين مريض مصاب بالفشل الكلوي المزمن كحالة وثلاثون عينة من أشخاص أصحاء كحالة ضابطة وتم قياس مكونات الدم بالإضافة لمستوى الحديد باستخدام جهاز التحليل الدموي الآلي (Sysmex KX-21) وجهاز التحليل الكيميائي الآلي (Selectra-XL) على التوالي وتم تحليل النتائج باستخدام برنامج الحزم الإحصائية للمجتمع (الإصدار 11.5).

وأظهرت الدراسة أن هناك إنخفاض ذو دلالة معنوية أقل من (0.05) في متوسطات خضاب الدم (8.5 جرام / ديسيليلتر) والخلايا المكذبة (26.5 بالمائة) من الدم وعدد كريات الدم الحمراء (3.0 مليون خلية /ملم<sup>3</sup> من مجموعة الحالة عند مقارنتها مع مجموعة الحالة الضابطة. وأظهرت الدراسة إلى أن انتشار فقر الدم بين المرضى المصابين بالفشل الكلوي المزمن كانت 69 حالة (98.5 بالمائة) بمتوسط الهيموغلوبين (8.4 جرام / ديسيليلتر) و الحالة المتبقية غير مصابة بفقر الدم ومتوسط الهيموغلوبين (12.0 جرام / ديسيليلتر).

وجد أيضا أن نوع فقر الدم المنتشر بين مرضى الفشل الكلوي المزمن هو نوع فقر الدم السوي (94.2 بالمائة)

أظهرت الدراسة أن هناك إنخفاض ذو دلالة معنوية أقل من (0.05) في مستوى الحديد في الدم عند المرضى المصابين بالفشل الكلوي المزمن بمتوسط (63 مايكروجرام / ديسيليلتر) عند مقارنته بالحالة الضابطة بمتوسط (96 مايكروجرام / ديسيليلتر) .

أظهرت الدراسة أن هناك ارتفاع ذو دلالة معنوية أقل من (0.05) في مستوى الفريتين في الدم عند المرضى المصابين بالفشل الكلوي المزمن بمتوسط (581 مايكروجرام / ليلتر) عند مقارنته بالحالة الضابطة بمتوسط (72 مايكروجرام / ليلتر).

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## List of Abbreviations

<b>2,3 DPG</b>	2,3-diphosphoglycerate
<b>AKI</b>	Acute Kidney Injury
<b>AIN</b>	Acute interstitial nephritis
<b>ARF</b>	Acute Renal Failure
<b>ATN</b>	Acute tubular necrosis
<b>BUN</b>	Blood urea nitrogen
<b>CBC</b>	Complete blood count
<b>CKD</b>	Chronic kidney disease
<b>CRF</b>	Chronic renal failure
<b>CRP</b>	C reactive protein
<b>DMT</b>	Divalent metal transporter
<b>EDTA</b>	Ethylene diamine tetra acetic acid
<b>EPO</b>	Erythropoietin
<b>ESRD</b>	End stage renal disease
<b>GFR</b>	Glomerular filtration rate
<b>GHRDS</b>	Gezira Hospital for Renal Diseases and Surgery
<b>Hb</b>	Hemoglobin
<b>Hct</b>	Hematocrit
<b>HIV</b>	Human immunodeficiency Virus
<b>IgA</b>	Immunoglobulin A
<b>MCH</b>	Mean Cell Haemoglobin
<b>MCHC</b>	Mean Cell Haemoglobin Concentration
<b>MCV</b>	Mean Cell Volume
<b>PC</b>	Programmed Computer
<b>PCV</b>	Packed Cell Volume

<b>RPI</b>	Reticulocyte Production Index
<b>URR</b>	Urea Reduction Ratio
<b>WBCs</b>	White Cell Count