الآية

بسم الله الرحمن الرحيم

قال تعالى:

(رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ وَعَلَى وَالِدَيَّ وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ وَأَصْلِحْ لِي فِي ذُرِّيَّتِي إِنِّي تُبْتُ إِلَيْكَ وَإِنِّي مِنَ الْمُسْلِمِينَ)

صدق الله العظيم

سورة الأحقاف

الآية 15

Dedication

To my father:

Your presence illuminates our path in life.

To my mother:

Your love gives me the courage and the determination.

To my husband:

You are the source of my strength and backup.

To my kids, sisters and brother:

I learned how to love through you.

To my colleagues:

You are beyond a class mate, you are my friends/sisters.

To everyone who helped me:

Thank you.

Roa…

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Abstract

Anemia is a common in patients with chronic renal failure specially in patients requiring hemodialysis. An important factor in successful treatment of anemia by giving erythropoietin stimulating agent combined with supplementary iron. So, iron status must be monitored regularly to ensure maintenance of adequate iron supplements without adverse effect of excess iron.

This study aimed to evaluate body iron status in Sudanese patients with end stage chronic renal failure treated with regular hemodialysis, recombinant erythropoietin and iron supplement, and correlate iron profile with age, gender and duration of hemodialysis.

Eighty patients were included in this study from two dialysis centers in Khartoum states (Ahmed Gasim and Asbab hospitals) . Data collected using structured interview questionnaire. Hematological parameters were measured using automated haematology analyzer (sysmex). Serum iron, total iron binding capacity (TIBC), and Serum ferritin measured using Bio system 350 semi automated spectrophotometer, and transferrin saturation percentage was calculated using the results of serum iron and total iron binding capacity. Data analyzed using statistical package for social sciences (SPSS).

Seventy five out of eighty patients (93.7%) were received regular intravenous iron dextran with EPO, and 5 patients (6.3%) were received oral iron.

Sixty five patients out of eighty (81.2%) were found to have anemia with Hb concentration <11 g\dl, the mean was 9.69±1.72. While high S.ferritin level with more than 800 µg\l were found in 71.2% of patients (57\80), of them the TSAT was > 50% in 27 patients (33.8%). Increase S.ferritin was statistically significant with duration of dialysis and with increase

intravenous iron doses, result values were *0.017* and *0.040* respectively. There were no influence of patients age or gender on iron profile.

In conclusion, patients with HDCKD who were treated with intravenous iron are prone to iron over load.

مستخلص البحث

فقر الدم شائع عند المرضي اللذين يعانون من الفشل الكلوي المزمن وخاصة في المرضى اللذين يحتاجون الى الاستصفاء الدموي. يعتبر اعطاء الاريثروبيتين بالاضافه الى الحديد التكميلي عامل مهم في نجاح علاج فقر الدم. لذلك يجب رصد حالة الحديد بانتظام لضمان الحفاظ على كمية كافيه من الحديد دون التاثير سلبا بسبب زيادته.

تهدف هذه الدراسة الى تقييم حالة الحديد لدي المرضي السودانيين الذين يعانون من الفشل الكلوي المزمن في المرحلة النهائية واللذين يعالجون بالاستصفاء الدموي, الاريثروبويتين و المكمل الحديدي, ثم ربط نتائج الملف الحديدي مع عمر ونوع المرضى ومدة الاستصفاء الدموي.

تم تضمين ثمانون مريضا في هذه الدراسة من مركزين لغسيل الكلى في ولاية الخرطوم (مستشفى أحمد قاسم ومستشفى أسباب). تم جمع البيانات عن طريق الاستبيان. تم قياس معدلات الدم باستخدام محلل الدم الالي (سيسمكس), وقد تم قياس الحديد المصل والقدرة الكلية على ربط الحديد وفرتين المصل باستخدام جهاز (بيوسيستم 350) شبه الالي الطيفي, ثم تم حساب نسبة تشبع ترانسفرين باستخدام نتائج الحديد المصل والقدرة على ربط الحديد الكلي. تم تحليل البيانات باستخدام الحزمة الاحصائية للعلوم الاجتماعية.

تلقى خمس وسبعون مريض من مجموع 80 (93.3%) ديكستران الحديد عن طريق الوريد بصورة منتظمة مع الاريثروبويتين, و خمس مرضى فقط (6.3%) كانوا يتلقون الحديد عن طريق الفم.

تم العثور على خمس وستون مريض من مجموع ثمانون (81.2%) يعانون من فقر الدم حيث كان تركيز الهيموجلوبين أقل من 11 جرام\ديسيلتر, حيث كان المتوسط 9.69 ± 1.72.

في حين تم العثور على ارتفاع مستوى فرتين المصل أكثر من 800 مايكروجرام| لتر في 71.2% من المرضى(57\80) , منهم كانت نسبة تشبع الحديد مرتفعه اكثر من (50 %) في 27 مريض (33.8%).

زيادة نسبة الفرتين المصل كانت ذات دلاله احصائية مع مدة الاستصفاء الدموي (ومع زيادة جرعات الحديد عن طريق الوريد وكانت قيم النتائج (*0.07و 0.040*) على التوالي.

لم يكن هناك تأثير لعمر أو نوع المرضى على نتائج الحديد.

نستنتج ان المرضى اللذين يعانون من الفشل الكلوي المزمن تحت الاستصفاء الدموي واللذين يعالجون بالحديد عن طريق الوريد عرضة لزيادة نسبة الحديد.

List of abbreviations

Abbreviations	Full name
ACD	Anemia of chronic disease
AOI	Anemia of inflammation
ARF	Acute renal failure
BFU-E	Burst forming unit- erythrocyte
CBC	Complete blood count
CKD	Chronic kidney disease
CFU-E	Colony forming unit- erythrocyte
CRF	Chronic renal failure
DMT	Divalent metal transport
DPG	Di phosphor gluconate
DW	Distilled water
EPO	Erythropoietin
ERBP	European Renal Best Practice
ESA	Erythropoietin stimulating agent
ESRF	End-stage renal failure
Fe^{++}	Ferrous iron
Fe^{3+}	Ferric iron
GFR	Glomerular filtration rate
Hb	Hemoglobin
HCP	Hem carrier protein
HD	Hemodialysis

HDCKD	Heodialysis chronic kidney disease
HIV	Human immunodeficiency virus
IDA	Iron deficiency anemia
IL	Inter leukin
IRE	Iron response element
KDIGO	Kidney Disease Improving Global Outcomes
LMW	low molecular weight
MCH	Mean cell hemoglobin
MCHC	Mean cell hemoglobin concentration
MCV	Mean cell volume
MW	Molecular weight
ml	Milliliter
NCC-CC	National collaborating center for chronic condition
ng/ml	Nanograms per milliliter
NICE	National and inistitute for health and care excellence
NKF-K/DOQI	National Kidney Foundation-Kidney Disease Outcomes Quality Initiative
NHANES III	National Health and Nutrition Examination Surve
RBCs	Red blood cells
rHuEPO	Recombinant Human Erythropoetin
ROS	Reactive oxygen species
R.P.M	Round per minute
R.T	Room temperature
SD	Standard deviation
TIBC	Total iron binding capacity
TSAT	Transferrin saturation

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