The Effect of Two Types of Intravenous Iron on Phagocytic Function of Neutrophils in Hemodialysis Patients

Thesis

Submitted for Partial Fulfillment of Master Degree
In Internal Medicine

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2016

Acknowledgement

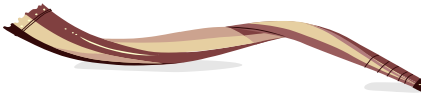
First and foremost, I would like to begin by thanking **ALLAH,** Most Strong, All Almighty, for providing me the strength and perseverance required to achieve this work.

I would like to express my deep gratitude to **Prof. Dr. Iman Ibrahim Sarhan,** Professor of Internal Medicine and Nephrology, Faculty of Medicine, Ain Shams University, for her helpful and constructive suggestions, and for the continuous encouragement that she generously offered during this work.

I am also very grateful to **Dr. Maha Abd El Moneim Behairy,** Lecturer of Internal Medicine and Nephrology, Faculty of Medicine, Ain Shams University, for her great and smart guidance and supervision of this work; also she devoted much of her precious time and effort in order to achieve this work in a successful form.

I would like to thank to **Dr. Doaa Mohamed Abd El Aziz,** Lecturer of Clinical pathology department, Faculty of Medicine, Ain Shams University, for her guidance and suggestions which were of great value to me.

Special thanks to my family and my Friends who helped me and provided me the personal support in completing this work.



Ahmed Lotfy

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List of Abbreviations

Abb.	Description
AGEs	Advanced glycation end products
AOPPs	Advanced oxidation protein products
ARIC	Atherosclerosis Risk in Communities
AVF	Arterio-venous fistula
BAAF	B cell activating factor
BMI	Body mass index
BUN	Blood urea nitrogen
Ca	Calcium
CAPD	Continousampulatory peritoneal dialysis
CERA	Continuous erythropoiesis receptor activator
CHF	Congestive heart failure
CHOIR	Correction of Hemogloblin and Outcomes in Renal Insufficiency
CHr	Reticulocyte Hb content
CKD	Chronic kidney disease
CREATE	Early Anemia Treatment with Epoetin Beta
CRP	C-reactive protein
CVD	Coronary vascular disease
DBP	Diastolic blood pressure
DCs	Dendritic cells
DHE	Dihydroethidum
DHR	Di –hydro- rodamine
DMT1	Divalent metal transporter
DRIVE	Dialysis Patients' Response to IV Iron with Elevated Ferritin

Abb.	Description
EDTA	Ethylene diaminetetraacitic acid
eGFR	Estimated glomerular filtration rate
EPO	Erythropoietin
ERBP	European Renal Best Practice
ESA	Erythropoietin-stimulating agents
ESRD	End stage renal disease
EUTox	European Uremic Toxin Work Group
FBC	Full blood count
FGF23	Fibroblast growth factor 23
fMLP	N-formyl-methionyl-leucyl-phenylalanine
Hb	Hemoglobin
HCV	Hepatitis c virus
Hcy	Homocysteine
HD	Hemodialysis
HDL	High-density lipoprotein
HDL	High-density lipoprotein
HIF	Hypoxia-inducible factor
HLA	Human leukocytes antigen
HOCl	Hypochlorous acid
ICAM-1	Intercellular Adhesion Molecule 1
ID	Iron dextran
IgLCs	Immunoglobulin light chains
IL	Interleukin
IS	Iron sucrose
IV	Intravenous
K/DOQI	Kidney Disease Outcomes Quality Initiative

Abb.	Description
KDIGO	Kidney Disease Improving Global Outcomes
LVH	Left ventricular hypertrophy
LVMI	Left ventricular mass index
MDA	Malondialdehyde
MGO	Methylglyoxal
MPO	Myeloperoxidase
NICE	National Institute for Clinical Excellence
NO	Nitric oxide
NTBI	Non-transferrin-bound iron
nTreg	Natural regulatory T cell
oxLDLs	Oxidized low-density lipoproteins
PAA	Phenylacetic acid
PAA	Phenylacetic acid
PBMCs	Peripheral blood mononuclear cells
PLT	Platelet
PMA	4-beta-phorbol 12-beta-myristate 13-alpha-acetate
PMNLs	Polymorphonuclear leukocytes
PTH	Parathyroid hormone
RBC	Red blood cell
RBP	Retinol binding protein
RBPs	Retinol-binding proteins
RENAAL	Reduction of Endpoint in NIDDM with the Angiotensin II Antagonist Losartan
RES	Reticuloendothelial system
ROS	Reactive oxygen species

Abb.	Description
RR	Relative risk
SBP	Systolic blood pressure
SFG	Sodium ferric gluconate
SLE	Systemic lupus erthrymatosis
SQ	Subcutaneously
TFTs	Thyroid function tests
THP	Tamm-Horsfall protein
TIBC	Total iron binding capacity
TIBC	Total iron binding capacity
TIR	Transferring receptor
TLC	Total leukocytic count
TLRs	Toll-like receptors
TNFα	Tumor necrosis factor alpha
TSAT	Transferrin saturation
UF	Ultrafiltration
URR	Urea reduction ratio

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The Effect of Two Types of Intravenous Iron on Phagocytic Function of Neutrophils in Hemodialysis Patients

Abstract

Background: Untreated anaemia of CKD is strongly associated with cardiovascular and renal complications, resulting in increased hospitalisations and mortality. Therefore, correcting anaemia is considered an important part of slowing or even stopping the progression of CKD. Intravenous (IV) iron preparations are widely used in the management of anemia in ESRD populations. **Aim:** To evaluate the effect of IV iron sucrose and iron dextran on phagocytic function of neutrophils in hemodialysis patients. **Subjects:** This study was including 20 ESRD patients on regular hemodialysis. Patients were divided into 2 groups: Group I: 10 ESRD patients on regular hemodialysis received 100 mg iron sucrose with the assessment of the phagocytic function of neutrophil cells by flow cytometry before and after giving it. Group II: 10 ESRD patients on regular hemodialysis received 100 mg iron dextran with the assessment of the phagocytic function of neutrophils before and after giving it. **Results:** All patients were subjected to the following: Full history and clinical examination including (age, sex, BMI, smoking, duration of hemodialysis, cause of renal failure, type of vascular access, symptoms or signs of active inflammation). **Conclusion:** The use of either IV iron dextran or iron sucrose maintenance dose in regular hemodialysis patients is associated with highly significant increase in neutrophil oxidative burst with worsening of the neutrophil phagocytic function and no significant difference between both types regarding this effect. **Recommendations:** Importance of tests of neutrophil function in hemodialysis patients regularly as to follow up the hazardous effects of iron therapy.

Keywords: CKD: chronic kidney disease, IV: intravenous, ESRD: end stage renal disease, BMI: body mass index.

Introduction

Aim of the Work

Chapter (1)

Iron Therapy in ESRD Patients