COMPARATIVE STUDY BETWEEN DIABETIC AND NON-DIABETIC RETINAL DISORDERS IN PREVALENT HAEMODIALYSIS PATIENTS

Thesis

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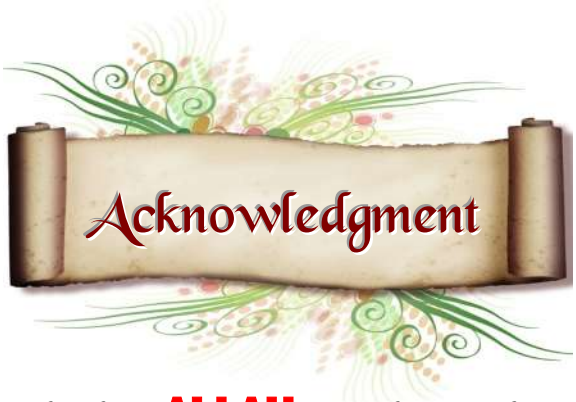

First thanks to **ALLAH** *to whom I relate any success in achieving any work in my life.*

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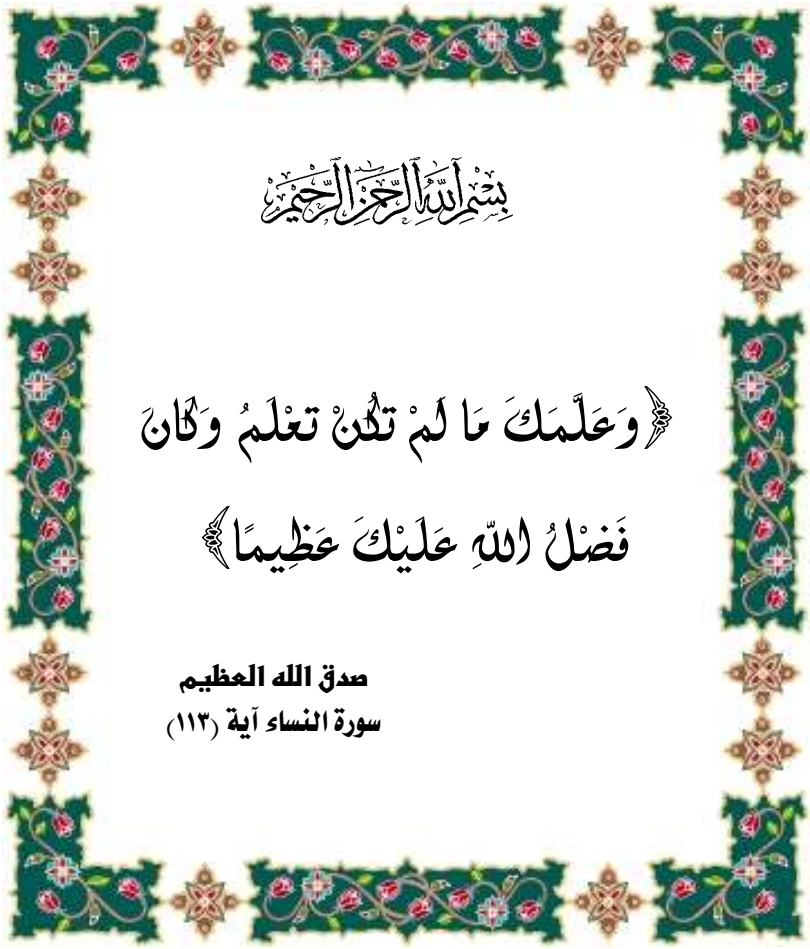
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صدق الله العظيم
سورة النساء آية (١١٣)

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List of Abbreviations

Abb.	Full term
ACEI	Angiotensin converting enzyme inhibitor
AER	Albumin excretion rate
AGEs	Advanced glycation end products
AKI	Acute kidney injury
APOE	Apo protein E
ARIC	Atherosclerosis Risk in Communities
BCM	Biocompatible membrane
BCVA	Best corrected visual acuity
CKD	Chronic kidney disease
CRF	Chronic renal failure
CTGF	Connective tissue growth factor
CVD	Cardiovascular disease
DCCT	Diabetic Control and Complications Trial
DKD	Diabetic kidney disease
DR	Diabetic retinopathy
ECM	Extracellular matrix
ESKD	End-Stage kidney disease
GFR	Glomerular filtration rate
HD	Hemodialysis
HDLC	High density lipoprotein cholesterol
HIT	Heparin induced thrombo-cytopenia
HITTS	Heparin induced thrombocytopenia and thrombotic syndrome
HL	Hepatic lipase
ICAM-1	Intercellular adhesion molecule-1
IDDM	Insulin-dependent diabetes mellitus
IGF	Insulin like growth factor
IL-1	Interleukin-1
IL-6	Interleukin-6
IOP	Intraocular pressure
IRMA	Intraretinal microvascular abnormalities
K/DOQI	K/Dialysis Outcomes Quality Initiative
LDL	Low-density lipoprotein

List of Abbreviations cont...

Abb.	Full term
LDLC	Low-density lipoprotein cholesterol
LPL	Lipoprotein lipase
MMPs	Matrix metalloproteinase
MTHFR	Methyltetrahydrofolate reductase gene
NADPH	Nicotinamide adenine dinucleotide phosphate
NVD	Neovascularization of the disc
NVE	Neovascularization elsewhere
OCT	Optic coherence tomography
PAN	Polyacrylonitrile
PDR	Proliferative diabetic retinopathy
PKC	Protein kinase C
PMMA	Polymethylmethacrylate
PRU	Percent reduction in urea
RBF	Renal blood flow
ROS	Reactive oxygen species
TAFI	Thrombim-activation fibrinolysis inhibitor
TCV	Total cell volume
TG)-β	Transforming growth factor-β
TGF	Transforming growth factor
TGF-3	Transforming growth factor-3
TG-plasma	triglycerides
UKM	Urea Kinetic Modeling
URR	urea reduction ratio
VA	Vascular access
VCAM-1	Vascular cell adhesion molecule-1
VE	Vascular endothelial
VEGF	Vascular endothelial growth factor
VLDLC	Very low density lipoprotein cholesterol

Abstract

In our study we found that most of the patients received three hemodialysis sessions /week each lasting four hours and the mean of urea reduction ratio was (mean 68.1% ± 11.8) in diabetic group and (mean 63.3% ± 10.0) in non diabetic group. National kidney Foundation (2006), recommended that the minimally adequate dose of given three hemodialysis times per week for treatment. The minimum dose is urea reduction ratio of 65%.

In our study the mean hemoglobin level was (10.8 ±0.9) gm/dl in diabetic group, and (10.5 ±1.1) gm/dl in non diabetic group, this level below the recommended level in the last recommendation.

Keywords: Renal blood flow- Reactive oxygen species- Thrombim-activation fibrinolysis inhibitor- Urea Kinetic Modeling - urea reduction ratio- Vascular access- Vascular endothelial

INTRODUCTION

End-Stage kidney disease (ESKD) is highly prevalent globally. It has become a major public health problem and is associated with considerable co-morbidity and mortality ***(Roaeid and Kaplan, 2010).***

The patient with ESRD is at risk for development of eye disease. This risk is related to the comorbid conditions that are often seen in ESRD patients as well as the unique effects of hemodialysis and the uremic state leading to changes in the conjunctiva, cornea, retina and macula ***(Gaia and Mitchell, 2012).***

The most common ocular complaints in ESRD patients include red, irritated eyes, and may be associated with elevations in the calcium-phosphate product. In those patients with chronically elevated calcium-phosphate product, band keratopathy may result. Other eye conditions include macular edema, ischemic optic neuropathy, elevated intra ocular pressure, retinal detachment and retinal hemorrhage ***(Gaia and Mitchell, 2012).***

Hemodialysis patients, especially the elderly, have visual acuity (VA) levels much lower than their age-matched counterparts. Decreased visual acuity is associated with reduction in quality of life, interference with daily activities, increased sudden fall, and difficulties in performing personal tasks ***(Theofilou, 2011).***

During hemodialysis, numerous metabolic parameters including blood urea, sodium, potassium, and sugar will be changed, these changes result in osmotic changes in blood and extracellular fluids, including aqueous and vitreous. Any changes in osmotic pressure of these fluids could affect the refractive status or visual acuity in hemodialysis patients ***(Mitchel et al., 2011).***

Retinal abnormalities that occur in ESRD include microvascular and diabetic retinopathy, macular degeneration, hemorrhage and calcification. Retinal hemorrhage occurs in renal failure as a feature of the moderate and severe forms of microvascular and diabetic retinopathy and of macular degeneration, and is exaggerated by the bleeding tendency in uremia. Retinal microvascular abnormalities are common because hypertension, renovascular disease and diabetes account for more than half of all patients with renal failure ***(Deva et al., 2011).***

In patients with End-stage renal disease, the microvasculature can be visualized directly in the retina. Focal abnormalities include localized vessel narrowing, arteriovenous nicking, hemorrhage, microaneurysms, and soft exudates ***(Qilun et al., 2011).***

AIM OF THE WORK

- To compare between diabetic and non-diabetic retinal disorders in prevalent hemodialysis patients.
- To study the correlation of retinal changes to the adequacy of hemodialysis.

Chapter One

CHRONIC KIDNEY DISEASE

Chronic kidney disease (CKD) is a devastating disease with clinical, economic and ethical dimensions, and is a recognized major public health problem. CKD is defined as kidney damage or glomerular filtration rate (GFR) less than 60 ml/min/l.73m^2 for 3 months or more, regardless of cause ***(Levey et al., 2005).***

The major outcomes of CKD, regardless of cause include progression to ESRD, complications of decreased kidney function, and cardiovascular disease (CVD). Increasing evidence indicates that some of these adverse outcomes can be prevented or delayed by early detection, and treatment ***(Remuzzi et al., 2002).***

CKD is the preferred term because another widely used one, chronic renal failure or insufficiency, is not as easily identifiable by patients as a disorder that affects the kidney. In addition, chronic renal failure (CRF) suggests that the kidneys have lost all of their function, whereas CKD covers the spectrum of clinical problems beginning with abnormalities detectable only by laboratory testing to a late stage, labeled uremia. When the kidney fails to perform most of its function, the clinical state is labeled end-stage renal disease ESRD, and dialysis or transplantation is required to sustain life ***(Mitch, 2007).***

ESRD is defined as either GFR less than 15mL/min per 1.73 m^2, which is accompanied in most cases by signs and