Association Of Cardiac Arrhythmias And Residual Kidney Function In Hemodialysis Patients

Thesis

Submitted for fulfillment of Master degree in internal medicine

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2016

Acknowledgement

*First of all, all gratitude is to **Allah** for hisgreat help and support during this work*

*I can hardly find the words to express my gratitude to **Prof. Dr.Osama Mahmoud Mahmoud**, Professor of internal medicine &nephrology, faculty of medicine, Ain Shams University, for his supervision, continuous help, and encouragement throughout this work. It is a great honor to work under his guidance and supervision.*

*I am also indebted to **Ass. Prof.Amr Mohamed Mohab ,** Assistant Professor of internal medicine&nephrology, faculty of medicine, Ain Shams University for his guidance, continuous assistance and sincere supervision of this work.*

I would like also to express my sincere appreciation and gratitude to ***Ass. Prof.Haitham Ezzat Abdelaziz,*** *Assistant professor of Internal Medicine&nephrology,Faculty of Medicine,Ain Shams University, for her continuous directions and support throughout the whole work.*

Special thanks to ***Dr.Mohammed Mostafa,*** *Lecturer ofInternal Medicine&nephrology, Ain Shams University, for his great efforts&supporton my research.*

My extra great thanks to ***Dr. Ahmed Rezq,*** *Lecturer of Cardiology, Ain Shams University, for his efforts on my research.*

Last but not least, I dedicate this work to my family (my mother , my father , and my sisters) & friends whom without their sincere emotional support, help & pushing me forward, this work would not have ever been completed.

Hagar Abdullah Abdelhameid,2016

List of Abbreviations

ACE	**Angiotension converting enzyme**
ACS	**Acute coronary syndrome**

APD	**Ampulatory peritoneal dialysis**
ASA	**Acetyl salicylic acid**
ASCVD	**Atheresclerotic cardiovascular disease**
BMI	**Body mass index**
BP	**Blood pressure**
CAD	**Coronary artery disease**
CAPD	**Continous ampulatory peritoneal dialysis**
CHF	**Congestive heart failure**
CKD	**Chronic kidney disease**
CKD5d	**Chronic kidney disease stage5 on dialysis**
CRF	**Chronic renal failure**
DM	**Diabetes mellitus**
ECW	**Extracellular water**
eGFR	**estimated Glomerular filtration rate**
ESRD	**End stage renal disease**
GP	**Glycoprotein platelet**
HD	**Hemodialysis**
HRV	**Heart rate variability**

HDL	**High lipid density**
HT	**Hypertension**
IDH	**Intradialytic hypotension**
IHD	**Ischemic heart disease**
IV	**Intravenous**
IVC	**Inferior venacava**
LV	**Left ventricle**
LVH	**Left ventricular hypertrophy**
MDRD	**Modification of diet in renal disease**
MI	**Myocardial infarction**
NO	**Nitric oxide**
NSAIDs	**Non steroidal anti-inflammatory drugs**
PCI	**Percutanous coronary intervention**
PD	**Peritoneal dialysis**
RAAS	**Renin angiotensin aldosterone system**
RKF	**Residual kidney functions**
SBP	**Systolic blood pressure**
SCD	**Sudden cardiac death**
US	**United states**

USRDS **United states renal data system**

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Introduction

RKF has been proven to contribue to the quality of life of dialysis patients. Longer preservation of RKF provides a better small and middle molecule removal, improved volemic status and arterial pressure control, diminished risk of vascular and valvular calcification due to better phosphate removal. Deterioration of RKF results in worsening of anemia, inflammation and malnutrition. It is now proven a direct relationship between RKF value and survival in dialysis patient ***(DFerechide,2009)***

RKF decreases, other complications appear; the anemia becomes more severe (with increased erythropoietin needs), hypoalbuminemia is aggravating, the arterial pressure pulse increases. All those data suggest that RKF influence on cardiac hypertrophy is due not only to water and

salt elimination, but also to other effects such as a better purification of uremic toxins. In predialysis CRF patients, left ventricle (LV) mass increases parallel with the decrease in residual GFR. ***(DFerechide,2009)***

Residual renal function, defined as the urinary clearance of urea and creatinine, is minimal in many patients treated with hemodialysis (HD) and tends to be ignored in most outcome studies involving HD patients. Recent studies showed that residual renal function, even at a low level, is influential in preventing mortality in the minority of patients with end-stage renal disease treated with peritoneal dialysis. This issue generally has not been examined in patients treated with HD. This prospective observational study of all 114 patients at a single community-based freestanding HD center is designed to examine the impact of residual renal function (defined as renal urea clearance and renal creatinine clearance derived from 24-hour

urinary volumes) on mortality over a 2-year period. ***(Dworkin,July 2001)***

Despite substantial progress in dialysis patients' management, cardiovascular disease remains the major cause of death. Nearly half of deaths on dialysis are secondary to myocardial infarction, cardiac arrest, malignant arrhythmias and other cardiac causes. The high prevalence of diabetes, anemia, hyperparathyroidism and hypertension among chronic dialysis patients fosters structural heart diseases. Moreover, fluid overload and metabolic abnormalities such as metabolic acidosis, dyskalemia and dysmagnesemia lead to an increased risk of clinically significant arrhythmias and sudden cardiac death. End-stage renal disease (ESRD) is often characterized by the presence of sympathetic hyperactivity and activation of the renin-angiotensin-aldosterone system (RAAS). Control of sympathetic outflow, blockade of the RAAS and prevention of electrolyte disorders should be the mainstay of cardiovascular prevention

in ESRD patients. This review summarizes the current available literature regarding the epidemiology of arrhythmias in dialysis patients, the underlying mechanism of atrial fibrillation or sudden death and potential interventions to reduce the risk of arrhythmias in dialysis patients, including medical therapy or defibrillators.***(Covic A,2009)***

Ventricular arrhythmia is a serious problem of hemodialysis patients. Clinicians engaged in hemodialysis are afraid of severe ventricular arrhythmias such as ventricular tachycardia and fibrillation during hemodialysis because it is difficult and dangerous to perform the cardiac resuscitation in a hemodialysis unit. Hemodialysis patients have several disorders of serum ion balance, anemia, and water retention, favoring arrhythmias. Hemodialysis patients administered with digitalis have increased risk of arrhythmia.Age, duration of hemodialysis, and acetate dialysis also have close relation with

occurrence of arrhythmias among hemodialysis patients. A high calcium phosphate product predialysis may be correlated with increased incidence of ventricular arrhythmias. Left ventricular hypertrophy (LVH) leads to ventricular arrhythmias and it is an independent risk factor for cardiac disease in dialysis patients. Hypertension, a well known risk factor for Complex Ventricular Arrhythmias in patients with essential hypertension, is applied to hemodialysis patients. Patients undergoing maintenance hemodialysis are periodically examined about their hematological and biochemical status, electrocardiogram, and chest X-ray. Blood pressure is frequently monitored during hemodialysis.***(Y Shimizu,2004)***

Several ECG markers, such as mean QRS duration, corrected QT interval, and QT dispersion, have been suggested as potential predictors of ventricular arrhythmias in dialysis patients.21–23 However, the relationship between these episodes of ventricular arrhythmias and risk of SCD has not

been established. In a large prospective study in patients with diabetes undergoing hemodialysis, Kraneet al24 reported that absence of sinus rhythm in ECG predicted high risk of all-cause mortality, whereas presence of LVH predicted high risk of SCD***.(Palaniappan Saravanan,2010)***

Aim of the work

The aim of this work is to assess the possible impact of residual kidney function in regular hemodialysis patients on the occurrence of arrhythmias.