Intradialytic Dysrhythmia in Chronic Renal Failure Patients under Regular Haemodialysis in Portsaid Governorate

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Eman Ahmed Basuony


بسم الله الرحمن الرحيم
﴿ رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي
أَنْعَمْتَ عَلَيَّ وَعَلَى وَالِدَيَّ وَأَنْ أَعْمَلَ
صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي
عِبَادِكَ الصَّالِحِينَ ﴾
صدق الله العظيم
سورة النمل آية (١٩)

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List of Abbreviations

Abbreviation	Meaning
ACT	Activated clotting time
AF	Atrial fibrillation
AV	Arterio-venous fistula
AVRT	Atrioventricularre-entry
Ca++	Calcium ions
CAD	Coronary artery disease
CBC	Complete Blood Count
CHF	Congestive heart failure
CKD	Chronic kidney disease
COPD	Chronic obstructive pulmonary disease(
CRF	Chronic renal failure
CUA	Calcific uremic arteriolopathy
CVC	Cardiovascular calcification
CVD	Cardiovascular diseases
DBP	Diastolic blood pressure
DM	Diabetes mellitus
EBCT	Electron-beam computed tomography
ECG	Electrocardiograph
ESRD	End-stage renal disease
FPG	Fasting blood glucose
GFR	Glomerularfiltration rate
HCV	Hepatitis c virus

Abbreviation	Meaning
HD	Haemodialysis
HDL	High density lipoprotein
HF	Heart failure
HRV	Heart rate variability
IDCM	Idiopathic dilated cardiomypathy
IHD	Ischemic heart disease
K+	Potassium ions
LBBB	Left bundle branch block
LDL	Low density lipoprotien
LVH	Left ventricular hypertrophy
Mg	Magnisum ions
MSCT	Multislice Computed Tomography
Na+	Sodium ions
NIDDM	Non insuline dependant diabetes mellitus
PT	Prothrombin Time
PTT	Partialthromboplastin Time
PVD	Peripheral vascular disease
RBBB	Right bundle branch block
SBP	Systolic blood pressure
SCD	Sudden cardiac death
SD	Standard deviation
USRDS	United States Renal Data System

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Introduction

Cardiovascular diseases (CVD) are major cause of morbidity and mortality in patients with end-stage renal disease (ESRD). The incidence of cardiovascular death occurring among dialysis patients is approximately 20 times higher than that in the general population ***(Helal et al., 2010).***

The high prevalence of cardiovascular disease, either clinically or simply echocardiographically detected, among beginning of renal replacement therapy suggests that the pathogenetic mechanisms leading to the development of cardiovascular complication begin to occure very early in the progression of chronic kidney disease (CKD), far before patients reach the need for dialysis ***(Locatelli et al., 2003).***

Many factors have been identified as a cause of increased prevalence of arrhythmia in patients with ESRD, among them the presence of coronary artery disease (CAD), heart failure, electrolyte abnormalities, left ventricular hypertrophy (LVH), left ventricular systolic and diastolic dysfunction, hypertension, diabetes mellitus ^duration of renal replacement therapy, increased volume load, uremic toxins, and silent ischemia ***(Bozbas et al., 2007).***

Arrhythmias frequently occur in patients undergoing hemodialysis. ECG abnormalities appear in 65% of patient

excluding sinus tachycardia and sinus bradycardia. The ECG abnormalities, not only arrhythmias, and left ventricular hypertrophy has the highest prevalence. But also myocardial ischemia and nonspecific ST-T changes may occur. Additionally, a wide range of electrocardiographic abnormalities may be seen in the patients ***(USRDS, 1997).***

Although arrhythmias commonly appear during hemodialysis, the rather large prevalence is partly due to baseline cardiac conditions. It was found that a combination of changes in intra- and extracellular K levels, changes in other electrolyte levels such as Mg and Ca, rapid correction of metabolic acidosis and decrease of circulating blood volume, appear to trigger arrhythmias in patients with latent cardiac problems ***(Shinichi et al., 1996).***

Patients undergoing HD seem to be at greater risk for arrhythmias than patients on peritoneal dialysis. Fast ventricular responses to atrial fibrillation may lead to angina pectoris, hypotension, increased risk of thromboembolic events and serious hemodynamic deterioration **(Atar et al., 2006).**

The diagnosis of arrhythmia in CKD is important because early recognition of disease can call for intensification of therapy to reduce cardiovascular events including myocardial infarction, hospitalization, and death ***(Soman et al., 2002).***

Aim of Work

The aim of study is to determine the prevalence, and different type of Intradialytic dysrhythmia in chronic renal failure (CRF) patients under regular haemodialysis patient in Portsaid governorate.

Cardiovascular Complications in Chronic Kidney Disease

Cardiovascular disease (CVD) is very common in patients with chronic kidney disease (CKD) and is by far the leading cause of morbidity and mortality in dialysis patients ***(USRDS et al., 2004).***

The majority of patients, particularly those with an estimated glomerular filtration rate (eGFR) of <60 ml/min, usually die from heart disease before they reach ESRD ***(Keith et al., 2004).***

Pathophysiology of cardiovascular disease in hemodialysis patients. Cardiovascular disease is the principal cause of morbidity and mortality in dialysis patients. The principal alterations responsible are left ventricular hypertrophy and arterial disease characterized by an enlargement and hypertrophy of arteries and the high prevalence of atheromatous plaques.

Left ventricular hypertrophy is the consequence of combined effects of chronic hemodynamic overload and non hemodynamic biochemical and neurohumoral factors characteristic of uremia. The hemodynamic overload is due to flow and pressure overload. The flow overload is tightly related

to hyperkinetic circulation caused by anemia, arteriovenous fistula, or over hydration and is characterized by an enlargement of the left ventricular cavity.

The pressure overload in these patients is more tightly related to abnormal geometry and function of large conduit arteries. The flow overload is responsible for remodeling of arterial tree, as the heart and vessels are a coupled interactive physiological system, cardiac and vascular alterations occur in parallel, being induced to a great extent by the same hemodynamic abnormalities.

The principal clinical consequences of left ventricular hypertrophy and arterial alterations are heart failure, ischemic heart disease, and peripheral artery disease. Cardiovascular alterations are only partly reversible, and efforts directed toward early prevention.

It is important to emphasize that the prevalence of CVD is increased among all patients with CKD, not only those with end-stage renal disease (ESRD). That is, the prevalence of LVH increases as glomerular filtration declines, and as many as 30% of patients reaching ESRD already have clinical evidence of ischemic heart disease or heart failure. Furthermore, it is important to note that patients with a reduced glomerular

filtration rate (GFR) are more likely to die of CVD than they are to develop ESRD ***(Wright et al., 2002).***

It is reasonable to consider three pathological forms of CVD that are highly prevalent in patients with CKD. The first is an alteration in cardiac geometry and includes eccentric LVH, concentric LVH, and LV remodeling. In the case of concentric LVH, thickness of the wall increases to a greater extent than LV diameter, whereas in eccentric LVH, the increase in wall thickness is in proportion to the increase in LV diameter. Risk factors for concentric LVH include pressure overload secondary to hypertension, arteriosclerosis, or aortic stenosis, and risk factors for eccentric LVH include volume overload secondary to fluid retention, anemia, or arteriovenous fistulae ***(Schunkert and Hense, 2001).***

The second pathological form of CVD is atherosclerosis. Atherosclerosis is the primary cause of ischemic heart disease in dialysis patients; however, it should be recognized that one study, admittedly in the pre-erythropoietin era, has shown that as many as 50% of non diabetic dialysis patients with angina may not have significant large-vessel coronary artery disease (CAD; defined by a luminal narrowing > 50% on angiography) ***(Sarnak et al., 2003).***