



INTERDIALYTIC WEIGHT GAIN AND ITS RELATION TO OUTCOME AMONG PATIENTS ON MAINTENANCE HEMODIALYSIS

Thesis

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List of abbreviations

ADMA	asymmetric dimethylarginine
APC	antigen-presenting cell
AV	Arteriovenous
AVF	arterio - venous fistula
AVG	Arterio- venous graft
BIP	Biolar
BMI	body mass index
BP	blood pressure
Ca	Calcium
CAD	coronary artery disease
cAMP	Cyclical adenosine monophosphate
CHOIR	The Correction of Hemoglobin and Outcomes in Renal Insufficiency
CKD	Chronic kidney disease
CKD-MBD	chronic kidney disease – mineral and bone disorder
CRF	chronic renal failure
CV	Cardiovascular
CVD	cardio-vascular diseases
DM	DIABETES MILLITUS
ECG	Electrocardiogram
ECV	
EDD	End Diastolic Diameter
EDV	End Diastolic volume
EF	ejection fraction
ESD	End Systolic Diameter
ESRD	end stage renal disease
ESV	End Systolic volume
FDA	Food and Drug Administration

FGF	fibroblast growth factor
FGF	fibroblast growth factor
GFR	Glomerular filtration rate
Hcy	Homocysteine
HD	Hemodialysis
HTN	HYPERTENSION
ICV	inter cellular volume
IDWG	Interdialytic weight gain
iPTH	intact parathyroid hormone
IVC	inferior vena cava
KDIGO	Kidney Disease: Improving Global Outcomes
KDOQI	Kidney Disease Outcomes Quality Initiative
LA	left atrium
LV	left ventricular
LVH	left ventricular hypertrophy
MACCE	major adverse cardiac and cerebrovascular events
MBF	Myocardial blood flow
MBF	myocardial blood flow
mTOR	mammalian target of rapamycin
NAR	nitrogen appearance rate
PD	peritoneal dialysis
Po4	Phosphate
PTH	parathyroid hormone
PW	posterior wall
RPV	Relative plasma volume
TTE	Trans thoracic Echocardiography

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Introduction



Introduction

Patients with end stage renal disease (ESRD) represent an important and increasingly prevalent portion of the medical patient, and the burden of concomitant illness is high in this patient population. Among ESRD patients treated with hemodialysis, the rate of hospitalization is 1.84/patient-year, with nearly one-third of these hospitalizations for cardiovascular (CV) causes (*Cabrera et al., 2015*).

Fluid retention is a major clinical problem in individuals with ESRD, and is associated with lower extremity edema, anasarca, ascites, pulmonary vascular congestion or edema, hypertension and worsening heart failure (*Kalantar-Zadeh et al., 2009*).

Interdialytic weight gain (IDWG), which corresponds to ultrafiltration losses during hemodialysis (HD), is the result of salt and water ingestion minus urine output between two consecutive dialysis sessions (*Lee et al., 2014*).

Theoretically, the consequences of this variable have a double meaning. On one hand, the water and salt intake occur frequently with caloric and protein foods, which mean it, would be associated with a better nutritional status (*Kalantar-Zadeh et al., 2009*)

But, on the other hand, water and salt intake can give rise to a volume overload, which can be the key for the developing of high blood pressure and left ventricular hypertrophy, both of which can increase the cardiovascular risk (*Kalantar-Zadeh et al., 2009*).

Other factors affecting IDWG include: residual renal function, sodium concentration in the dialysis fluid, saline solution infusions during the HD session, especially during its final minutes (*Lopez-Gomez et al., 2005*)

Chronic kidney disease (CKD) is associated with increased cardiovascular morbidity, even from early stages. Decreased glomerular filtration rate (GFR) is a strong predictor of cardiovascular events, even in the absence of other cardiac risk factors. Risk for cardiovascular disease in CKD patients is 10 – 30 times higher than in non-CKD individuals and mortality from cardio-vascular diseases (CVD) accounts for approximately 50% from all causes of death in dialysis population. Predisposing features for developing CVD in CKD patients include both traditional and nontraditional uremia associated factors (*Nechita et al., 2015*).

The phenomenon of HD induced myocardial stunning is common and associated with reductions in myocardial contractile function and patient survival. Measurement of myocardial blood flow (MBF) during dialysis demonstrated that HD can precipitate myocardial ischemia (*Burton et al., 2003*).

Myocardial stunning was originally described as ‘delayed recovery of regional myocardial contractile function after reperfusion despite the absence of irreversible damage and despite restoration of normal flow’. Transient episodes of myocardial ischemia leading to prolonged left ventricular (LV) dysfunction were established as a cause of heart failure (*Zuidema & Dellsperge, 2012*).

In a multivariate analysis, age, predialysis cardiac troponin T levels, hypotension during dialysis, and ultrafiltration volumes independently predicted the occurrence of HD-induced cardiac injury and myocardial stunning (*Zuidema and Dellsperger, 2012*).

Previous studies have revealed that excessive IDWG is associated with adverse clinical outcomes, and to be an independent predictor of all-causes and cardiovascular mortality in patients undergoing long-term HD. In addition, accumulating evidence shows that IDWG is significantly associated with increase in blood pressure (BP) and left ventricular hypertrophy (LVH), both of which can increase the risk of cardiovascular mortality in patients with end-stage renal disease (ESRD) (*Lee et al., 2014*).

The mechanism by which IDWG affects cardiovascular morbidity and mortality can be speculated from the cardiovascular burden of volume overload, volume fluctuation, and arterial hypertension. Daily fluctuations in extracellular fluid volume might promote cardiac remodeling by the activation of mammalian target of rapamycin (mTOR) pathway, sympathetic nervous system, and renin-angiotensin-aldosterone pathway resulting in LVH and cardiac fibrosis (*Lee et al., 2014*).



Aim of the Work



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To assess interdialytic weight gain and (its relation to morbidity and mortality) among patients on maintenance hemodialysis.



Review of Literature

