بسم الله الرحمن الرحيم

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بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

Neutrophil-Lymphocyte ratio and Monocyte-Lymphocyte ratio as predictors of cardiovascular risk and mortality in End Stage Renal disease

Thesis

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In Internal Medicine

By

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Salma Fathy

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List of Abbreviations

Abb	Full-term
AGEs	Advanced Glycation End Products
CAD	Coronary Artery Disease
CKD	Chronic Kidney Disease
CRP	C-Reactive Protein
CVD	Cardiovascular Disease
CVE	Cardiovascular Events
ESRD	End Stage Kidney Disease
HD	Hemodialysis
HDL	High Density Lipoprotein
HF	Heart Failure
hs-CRP	High Sensitivity C-Reactive Protein
IL	Interlukin
LDL	Low Density Lipoprotein
LV	Left Ventricle
LVH	Left Ventricular Hypertrophy
LVMI	Left Ventricular Mass Index
Lymph	Lymphocyte
MLR	Monocyte-Lymphocyte Ratio
Mono	Monocyte
Neut	Neutrophil
NLR	Neutrophil-Lymphocyte Ratio
PD	Peritoneal Dialysis
TC	Total Cholesterol
TG	Triglycerides
TLC	Total Leucocytic Count
TNF	Tumor Necrosis Factor

List of Abbreviations(Continued)

Abb	Full-term
VC	Valvular Calcification

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INTRODUCTION

Chronic, low-grade inflammation is regarded as a common comorbid condition in CKD, and particularly in chronic dialysis patients ***(Akchurin and Kaskel, 2015).***

In chronic dialysis, markers of systemic inflammation are notably elevated, including CRP and IL-6 ***(Panichi et al., 2002).***

The uremic milieu also promotes oxidative stress ***(Panichi et al., 2002)*** and carbonyl stress ***(Aveles et al., 2010)*** both of which are highly proinflammatory. Epigenetic influences, resulting from the interaction between genetic background and diet, lifestyle, and environment also contribute to increased inflammation ***(Akchurin and Kaskel, 2015).***

Frequent infectious and thrombotic events provide additional inflammatory stimulations, particularly in dialysis patients, including catheter-related bloodstream infections, access site infections and thrombosed intravenous fistulas and grafts ***(Nassar, 2013).*** The microbiological quality of the dialysate and impurities in dialysis water may also contribute to inflammation ***(Santoro and Mancini, 2014).***

Dietary factors common in CKD, such as low dietary potassium and phosphorus, can alter the gut microbiome, leading to dysbiosis (pathogen overgrowth in the gut). Metabolic alterations associated with uremia also favor

dysbiosis, which promotes translocation of bacterial DNA and endotoxins to the bloodstream via colon wall inflammation and epithelial tight junction barrier breakdown, thus promoting systemic inflammation ***(Lau et al.,2015).*** Other commonly proposed mechanisms for chronic inflammation include altered adipose tissue metabolism via proinflammatoryadipokines***(Iglesias and Diez, 2010)*** and a high prevalence of proinflammatory comorbidities, such as diabetes and atherosclerotic disease ***(Akchurinand Kaskel, 2015).***

End stage renal disease patients have a high risk of developing cardiovascular disease ***(Tonelli et al.,2016)*** and sudden cardiac deaths ***(Tereshchenko et al.,2016).***

Derived from the leukocyte count, the neutrophil to lymphocyte ratio (NLR) and monocyte to lymphocyte ratio (MLR) are inexpensive tests.

Elevated NLR levels have been demonstrated to be associated with various adverse clinicopathological conditions in patients with certain malignancies, including colorectal cancer ***(Halazun et al.,2008)*** pancreatic ductal adenocarcinoma ***(Bhatti et al.,2010).***

Evidences revealed that neutrophil-to-lymphocyte ratio (NLR) or monocyte-to-lymphocyte ratio (MLR) in peripheral blood could be regarded as reliable indicators of system inflammation, which is used for early prediction of the prognosis and outcome of cardiovascular diseases,

including mortality of myocardial infarction ***(Azab et al., 2010)*** and heart failure patients ***(Delcea et al., 2019).***

An interesting association was identified between increased NLR values and left ventricular systolic EF, thus confirming that sustained release of proinflammatory cytokines and proteolytic enzymes by neutrophils may play an active role in negative cardiac remodeling ***(Durmus et al.,2015).***

In our study we shall study the relation between both neutrophil to lymphocyte ratio and monocyte to lymphocyte ratio and the prediction of cardiovascular events and mortality in End Stage Renal disease patients on regular hemodialysis.

Aim of the Study

In our study we shall study the relation between both neutrophil to lymphocyte ratio and monocyte to lymphocyte ratio and the prediction of cardiovascular events and mortality in End Stage Renal disease patients on regular hemodialysis.

Chapter (1):
Inflammation and End Stage Kidney Disease

For more than 20 years, chronic inflammation has been recognized as a main component of the uraemic phenotype linked to cardiovascular disease(CVD) and protein energy wasting, and a strong predictor of poor outcome in dialysis patients. Many steps have been taken in the understanding of the factors leading to chronic inflammation and the pathways involved in the pathophysiology of this common complication, but a lot is needed to develop a solid therapeutic interventions for the treatment of this important component of the uraemic milieu ***(Cobo et al.,2018).***

Activation of inflammation; a physiological process in the short term, is beneficial but when persistently activated promotes a series of complications. The inflammatory process is a protective physiological mechanism in the host defense against infections, the tissue-repair response, adaptation to stress and restoration of a homeostatic state. A controlled inflammatory response is beneficial to the host in eradicating the injurious stimuli and initiating the healing process in the tissue; but it can also become detrimental if deregulated. In fact, the pathological potential of inflammation is unprecedented for a physiological process,