بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

Neutrophil to lymphocyte ratio and platelet to lymphocyte ratio in evaluation of inflammation and nutritional Status in pre dialysis chronic kidney disease patients

Thesis

Submitted for partial fulfillment of Master Degree in Internal Medicine

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2021

First of all, all gratitude is due to Allah almighty for blessing this work, until it has reached its end, as a part of his generous help, throughout my life.

Prof. Sahar Mahmoud Shawky Professor of Internal Medicine and Nephrology Faculty of Medicine - Ain Shams University, I would like to gratefully acknowledge the support, supervision and kindness of ***Asst. Prof. Maha Abd El Moneim Behairy,*** Assistant Prof of Internal Medicine and Nephrology**,** Faculty of Medicine - Ain Shams University for her moral support and continuous guidance had given me great help throughout my study. My sincere thanks to ***Asst. Prof. Somia Abd El hamid Bawady***, Assistant Prof of Clinical Pathology, Faculty of Medicine in Ain Shams University for her valuable supervision, support and continuous help.

I would like also to thank all participants in this study who gave their time and cooperation during data collection.

Ghada Abd El Hahmed El Kezza

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List of Abbreviations

CKD	Chronic kidney disease
ESRD	End stage renal disease
GFR	Glomerular filtration rate
GIT	Gastrointestinal tract
CVD	Cardiovascular disease
GERD	Gastroesophageal reflux disease
DM	Diabetes mellitus
ESAs	Erythropoiesis- stimulating agents
HTN	Hypertension
NK	Natural killer
MIA	Syndrome malnutrition – inflammation - atherosclerosis
CRP	C-reactive protein
IL1β	Iterleukin-1beta
IL-6	Interleukin-6
IL-1	Interlukin-1
hs-CRP	High-sensitivity C-reactive protein
PTX3	Pentraxin
ROS	Reactive oxygen species
PMN	Polymorph nuclear cells
TLR-4	Toll-like receptors 4
TLR-2	Toll-like receptors-2
CLRs	C-type lectin receptors
TNF-α	Tumor necrosis alpha
G-CSF	Growing factor
DAMPs	Damage-associated molecular patterns
PRRs	Pattern recognizing receptors

RIGs	Retinoic acid-inducible gene
NF-kB	Nuclear factor-kappa B
NLRs	Intracellular Node-like receptors
HIN-200	Hematopoietic interferon - 200
AP-1	Activator protein-1
RCC	Renal cell carcinoma
MPs	Membrane microparticles
TLC	Total leukocyte count
DLC	Differential leukocyte count
PAMPs	Pathogen-associated molecular patterns
NLR	Neutrophil – lymphocyte ratio
PLR	Platelet – lymphocyte ratio
HD	Hemodialysis
MHD	Maintenance HD
PEW	Protein energy wasting
ISRNM	International society of renal nutrition and metabolism
RRT	Renal replacement therapy
RAAS	Renin angiotensin aldosterone system
IGF-1	Insulin -like growth factor- 1
IGF-1BP	Insulin -like growth factor binding proteins
BMI	Body mass index
IHME	Institute for health metrics and evaluation
ORG	Obesity-related glomerulopathy
%UBW	%usual body weight
TSF	Triceps- skin fold
FFM	Fat free mass
FM	Fat Mass
MAC	Mid arm circumference
MAMC	Arm muscle circumference

ECW	Extracellular water
BCM	Body cell mass
ECM	Extra-cellular mass
APPR	Acute phase protein response
Hcy	Homocysteine
PD	Peritoneal dialysis
TBN	Total body nitrogen
TBK	Total body potassium
DXA	Dual x-ray absorptiometry
BIA	Bio-impedance analysis
SGA	Subjective global assessment
m-SGA	Modified subjective global assessment
DMS	Dialysis Malnutrition Score
MIS	Malnutrition Inflammation Score
CAPD	Continuous ambulatory peritoneal dialysis
PG-SGA	Patient-Generate Subjective Global Assessment
PhilSPEN	Philippine Society of Parenteral and Enteral Nutrition
RDN	Registered dietitian nutritionist
nPCR	Normalized protein catabolic rate
PNA	Protein equivalent of total nitrogen appearance
QOL	Quality of life
MNT	Medical Nutrition Therapy
NEAP	Net Acid production
LC n-3 PUFA	Long Chain Omega-3 Polyunsaturated Fatty Acids
IDPN	Total and Intradialytic Parenteral Nutrition
DASH	Dietary approaches to stop hypertension
DGA	Dietary guidelines for American

HDF	Hemodiafiltration
HDx	Expanded HD
HRO	High retention onset
MCO	Medium cut-off
MDRD	Modification of Diet in Renal Disease
ACR	Albumin : creatinine ratio
HGS	Hand grip strength
WHO	World health organization

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INTRODUCTION

Chronic kidney disease (CKD) is defined as decline in glomerular filtration rate (GFR) to less than 60 ml/min/1.73 m² with or without structural kidney damage for more than 3 months ***(Levey et al.,2011)*** , it considered as a significant emerging worldwide health problem ***(Levey et al., 2007)*** that leading to an economic burden on health care system ***(Freeman et al., 2018)***, yet over the past 27 years CKD burden has not decline as a burden of other important non-communicable diseases , in 2017 there is 1.2 million deaths as a result of CKD , by 2040 the number has been projected to rise to 2.2 million in a best-case scenario and up to 4 million in a worst-case scenario (***Cockwell & Fisher, 2020).***

In CKD patients the mortality mainly been attributed to cardiovascular disease (CVD) for many years , the evidence of non-cardiovascular mortality in CKD patient also increased during last years like a mortality from infection or malignancies , the relation between some traditional risk factors for CVD and non-cardiovascular mortality in uremic environment also described (***De jager et al.,2014).***

Inflammation and malnutrition considered as a components of CKD that can leading to poor outcome

(Maraj et al., 2018) , Sustained low grade inflammatory status in CKD have been proved in many studies ***(Kutsal et al., 2016), (Ahbap et al, 2016), (Abd ElHafeez et al., 2018)*** and considered as an essential part of CKD since 1990 ***(Akchurin & Kaskel ,2015)*** , with prevalence of 30%-60% for inflammation and 40% for malnutrition in uremic patients which described as independent risk factors for mortality in CKD ***(Kutsal et al., 2016)*** .

Inflammation is considered as important link between increased risk of both cardiovascular and non-cardiovascular mortality in CKD patients (***De jager et al.,2014)*** , and the role of inflammatory mediators is proven in many studies after detection of high levels of these mediators in patients with CKD (***Maraj et al., 2018)***, (***Pecoits- Filho et al., 2002).***

The relation of inflammation and malnutrition to CVD is mentioned in previous studies known as malnutrition, inflammation, and atherosclerosis referred as MIA syndrome , considered as a silent factor for increased cardiovascular mortality rates in CKD patients , this increasing in cardiovascular mortality is not enough to be explained by the effect of traditional risk factors like diabetes mellitus (DM), hypertension (HTN), hyperlipidemia ***(Turkmen et al., 2012).***

Inflammatory mediators play an important role in development of atherosclerotic heart disease and considered as a strong indicator for its progression, acute phase reactant like c-reactive protein (CRP) and proinflammatory cytokines like interleukin-6 (IL-6) & tumor necrosis factor alpha (TNF-α) are will known conventional inflammatory mediator as will as a total leukocyte count (TLC) the classical inflammatory markers in many cardiovascular studies , the differential leukocyte count (DLC) is introduced in evaluation of inflammatory response that related to CVD, neutrophilia and relative lymphocytopenia are founded to be independent predictor of mortality in patient with heart failure ***(Okyay et al., 2013).***

Neutrophil to lymphocyte ratio (NLR) introduced as inflammatory marker in many cardiac and non-cardiac diseases ***(Sibarani et al., 2018)*** , it is easily determined and cost effective predictor of mortality in patient with heart failure and myocardial infarction ***(Okyay et al., 2013)***

In some researches NLR is found to be associated with CKD and its progression ***(Sibarani et al., 2018)*** and reported to be closely related to inflammation in both hemodialysis (HD) and peritoneal dialysis (PD) with limited data regarding this association in pre-dialysis CKD patients .