# Study of the relationship between inflammation and depression in haemodialysis patients

**Thesis**

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*Ahmed Mohamed Salem*

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# Abbreviations

| | |
|---|---|
| CKD | Chronic kidney disease |
| ESRD | End stage renal disease |
| RRT | Renal replacement therapy |
| HD | hemodialysis |
| MIA | malnutrition inflammation atherosclerosis |
| MIAD | malnutrition inflammation–atherosclerosis–depression |
| TNF | tumor necrosis factor |
| IL1 | interleukin 1 |
| IL6 | interleukin 6 |
| BUN | Blood urea nitrogen |
| HS CRP | High sensitive c reactive protein |
| HB | Hemoglobin level |
| GFR | Glomerular filtration rate |
| NKF | National Kidney Foundation |
| KDOQI | Kidney Disease Outcomes Quality Initiative |
| CRI | Chronic renal injury |
| P/Cr | Protein, creatinine ratio |
| HTN | Hypertension |
| MDRD | Modification of Diet in Renal Disease |

## List of Abbreviations

| | |
|---|---|
| KDIGO | Kidney Disease Improving Global Outcomes |
| AKI | acute kidney injury |
| ARVD | atherosclerotic Reno-vascular disease |
| ADPKD | autosomal dominant polycystic kidney disease |
| ACR | albumin-to-creatinine ratio |
| RAAS | renin–angiotensin–aldosterone system |
| PD | Peritoneal dialysis |
| CAPD | Continuous ambulatory peritoneal dialysis |
| CCPD | Continuous cycler-assisted peritoneal dialysis |
| USFTF | US Preventive Services Task Force |
| MDD | with major depressive disorder |
| BDI | Beck Depression Inventory |
| PSTF | PREVENTIVE SERVICES TASK FORCE |
| SLE | Systemic lupus erythematosis |
| GN | Glomerulonephritis |
| IHD | Ischemic heart disease |
| CVD | Cardiovascular disease |
| ECT | electroconvulsive therapy |
| SSRI | selective serotonin reuptake inhibitors |
| MAOI | monoamine oxidase inhibitors |
| (GH/IGF-1) | growth hormone/insulin like growth factor-1 |

## List of Abbreviations

| | |
|---|---|
| VLDL | Very low-density lipoprotein |
| LDL | Low Density Lipoprotein |
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# Introduction

# *INTRODUCTION*

Chronic kidney disease (CKD) is determined by the presence of kidney injury and by the level of renal function, assessment according to the glomerular filtration rate. Following the criteria proposed by the National Kidney Foundation (2002), the CKD is divided into five stages, classified according to the degree of the patient's renal function. Until the fourth stage of the disease, the so-called "conservative treatment" is recommended. In more advanced stages, called end-stage renal disease (ESRD), -i.e., when the kidneys can no longer maintain homeostasis of the body, the patient will depend on one of the modalities of renal replacement therapy (RRT): dialysis or kidney transplant ***(Kimmel, et al 2002)***

The medical risk factors associated with increased mortality in hemodialysis (HD) patients are well known, but the psychosocial factors that may affect outcome have not been clearly defined. One key psychosocial factor, depression, has been considered a predictor of mortality. ***( Kimmel PL, et al,(2000),)***

Depression is the most common psychiatric illness in patient with CKD affecting 20-30% patients on dialysis with 10 % having a major depressive disorders, however, there is a difficulty in recognizing its true extent in this population. This is due to methodological variations among studies (such as the diversity of instruments applied which does not allow a comparison of results) and the difficulty of diagnosis generated by similarity of somatic

symptoms present in depression and uremic symptoms, which leads to an increased number of false-positive cases ***(Kimmel, et al 2001, 2002)***

Depression issue in hemo-dialyzed patients has been addressed many times in the past nowadays, rapid and pronounce development in renal replacement therapy was observed which was followed by deep change in profile of hemodialyzed population ***(Ricardo AC, et al (2010))***

Etiopathology of depression in patients with CKD is multifactorial, both medically and psychologically based. Additional factors also influence development of depression in ESRD patients. Chronic pain and sleep disturbances affect health-related quality of life (HRQOL) and depression in patients with all stages of CKD ***(Odden ,et al ,2006)***and with ESRD with regard to not clear causality and order. Additionally, numerous authors underline role of patient's inflammatory status in depression development ***(Ibrahim S, et al ,2008).***

Since there is little data about prevalence of depression in hemodialyzed population we designed a study haemodialyzed patients to address this issue and we will we will try to identify potential risk factors for depression development in this population with regard to inflammatory status. The question arises: is depression a new player in MIA syndrome? Confirming this hypothesis may result in changing MIA (malnutrition inflammation atherosclerosis)

to MIAD syndrome abbreviation (malnutrition inflammation–atherosclerosis–depression) in the future.

Many prior observations support the likelihood that pro inflammatory cytokines, interleukin 1 (IL-1), interleukin 6 (IL-6), and tumor necrosis factor (TNF) in particular, are involved in the pathogenesis of hemodialysis-related disease (**Capuron, et al,.2011)**

These cytokines were found to have a significant influence on neurotransmitter metabolism and neuroendocrine function and thus have been associated with the vegetative symptoms of depression ***(Miller DB,et al 2005)***

There is a growing body of evidence that supports a relationship between cytokines and emotional symptoms However, the results of prior studies have not been consistent, and it remains unclear whether these results might be relevant to patients receiving hemodialysis. Moreover, malnutrition ,commonly observed in dialysis patients, has been associated with chronic inflammation***(Pertosa G,et al 2000)***

Malnutrition has also been associated with emotional symptoms in patients receiving hemodialysis , The complexity of the relationships among inflammation, nutritional status, and emotions in patients receiving hemodialysis, remains poorly understood. ***(Czira ME, et al, 2011)***

# Aim of the Work

# *AIM OF THE WORK*

The aim of this thesis is to study the prevalence of depressive symptoms in hemodialyzed patients and to identify the possible role of inflammation in depression development.

# Review of Literature