



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم



**MONA MAGHRABY**



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكرو فيلم



# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكرو فيلم



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التوثيق الإلكتروني والميكروفيلم

# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

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علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



### يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



**MONA MAGHRABY**

# **Hemodialysis Patients through Systemic Inflammation**

Thesis

*Submitted for Partial Fulfillment of Master degree in  
**Internal Medicine***

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا  
إلا ما علمتنا إنك أنت  
العليم العظيم

صدق الله العظيم

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# List of Abbreviations

Abb.	Full term
<b>AAMI</b>	American association of medical instrumentation
<b>ACEI</b>	Angiotensin converting enzyme inhibitor
<b>ACR</b>	Albumin creatinine ratio
<b>AD</b>	Atopic dermatitis
<b>ADMA</b>	Asymmetric dimethyl arginine
<b>AGEP</b>	Advanced glycation end products
<b>AKI</b>	Acute kidney injury
<b>ARBs</b>	Angotensin receptor blockers
<b>ASV</b>	Anodic stripping voltammetry
<b>AUC</b>	Area under the ROC curve
<b>BLL</b>	Blood lead level
<b>CAPD</b>	Continous ambulatory peritoneal dialysis
<b>CKD</b>	Chronic kidney disease
<b>CKD ap</b>	Chronic kidney disease associated pruritus
<b>CPD</b>	Chronic Peritoneal dialysis
<b>DLQI</b>	Dermatology life quality index
<b>DOPPS</b>	Dialysis outcome and practice pattern study
<b>ESRD</b>	End stage renal disease
<b>EUTox</b>	European uremic toxin
<b>FAAS</b>	Flame atomic absorbtion spectrometry
<b>GFAAS</b>	Graphite furnace atomic absorbtion spectrometry
<b>GFR</b>	Glomerular filtration rate
<b>GLA</b>	Gamma linolenic acid
<b>Hb</b>	Hemoglbin
<b>HD</b>	Hemodialysis
<b>hsCRP</b>	High senestivity c reactive protein
<b>ICP-MS</b>	Inductively coupled plasma mass spectrometry
<b>iPTH</b>	Intact parathyroid hormone

# List of Abbreviations (Cont...)

Abb.	Full term
<b>IS</b>	Indoxyl sulfate
<b>KDIGO</b>	The international guideline group Kidney Disease Improving Global Outcomes
<b>MDRD</b>	Modification of diet in renal disease
<b>MHD</b>	Maintanance hemodialysis
<b>Na+</b>	Soduim
<b>NKF</b>	National kidney foundation
<b>NRS</b>	Numeric rating scale
<b>OS</b>	Oxidative stress
<b>Pb</b>	Lead
<b>PBI-P</b>	patient benefit index of pruritus
<b>P-CS</b>	P crysyl sulfate
<b>PD</b>	Peritoneal dialysis
<b>QOL</b>	Quality of life
<b>ROC</b>	Receiver operating characteristic curve
<b>ROS</b>	Reactive oxygen species
<b>RRT</b>	Renal Replacement Therapy
<b>SDMA</b>	Symmetric dimethyl arginine
<b>TH</b>	T-Helper
<b>TNF</b>	Tumour necrosis factor
<b>UF</b>	Ultrafiltration
<b>UP</b>	Uremic Pruritus
<b>US</b>	Ultrasound
<b>UVB</b>	Ultraviolet B
<b>VAS</b>	Visual Analogue Scale
<b>VRS</b>	Verbal rating scale
<b>WRO</b>	Water reverse osmosis

## INTRODUCTION

**E**nd stage renal disease represents a clinical state or a condition in which there has been an irreversible loss of the endogenous renal function to a degree which is sufficient to render the patient permanently dependent upon Renal Replacement Therapy (RRT) which may be dialysis or kidney transplantation (*Rajan and Santhi, 2012*).

Uremic pruritus is a common and burdensome symptom for patients with kidney failure, affecting up to 46% of hemodialysis patients. Uremic pruritus is most commonly described as a daily or near-daily occurrence of itch that spans large bilaterally symmetrical surface areas. It does not exhibit a dermatomal pattern and there is no associated primary skin lesion. Uremic pruritus can vary from a generalized itch to a localized itch affecting the back, face, and arms (*Simonsen et al., 2017*).

The association between uremia and pruritus was first reported more than a century ago. Patients with severe chronic renal failure may be predisposed to the development of xerosis, hyperpigmentation, uremic roseola, calcinosis cutis, acquired perforating dermatosis, bullous dermatosis of hemodialysis, half and half nails and pruritus (*Aramwit and Supasyndh, 2015*).

Uremic pruritus can compromise the psychosocial and emotional wellbeing as well as the overall health-related quality of life of the patients. Interestingly, emerging evidence from observational studies reported that dialysis patients with extreme pruritus were more likely to have a high mortality rate and suffer from sleep disturbances, depressive symptoms or chronic subclinical inflammation (*Nochaiwong et al., 2017*).

Data for therapy specifically for uremic pruritus remains limited, although topical therapies, gabapentin, type B ultraviolet light phototherapy, acupuncture, and opioid-receptor modulators all may play a role (*Combs et al., 2015*).

Unfortunately, the pathogenesis of uremic pruritus remains poorly understood. Proposed hypotheses include systemic inflammation, imbalance between the expression of opioid receptors, and other risk factors. Blood lead level has been reportedly associated with inflammation and nutritional status in long-term haemodialysis patients and might contribute to 1-year mortality in these patients. All-cause, cardiovascular, and infection-related 18-month mortality in patients on maintenance haemodialysis were positively associated with high blood lead level. Taking these findings into consideration, there might be an interaction or association between blood lead level and uremic pruritus through systemic inflammation (*Weng et al., 2017*).

Exposure to lead, potentially, may come from many different environmental sources, including industrial pollution, lead containing paints, contaminated water from old lead pipes, traditional medicines, cosmetics, hair dyes, and inhalation of fumes from burning lead batteries (*Davenport et al., 2009*).

Lead is a metal without biological function. The body cannot use it but can be absorbed and stored. Lead has an accumulative effect and its poisoning can be made even in a little amount..it was shown that the blood lead level is higher in endstage renal disease Patients who were on maintenance haemodialysis than in the healthy adults, the blood lead level was found to increase with the duration of maintenance haemodialysis (*Palaneeswari et al., 2012*).

Trace elements physiology is highly complicated because their secretion ways are binding with protein and tissue concentrations. It is clear that Trace elements status in end stage renal disease patients is different from healthy people and this issue makes the requirement of careful studies on clinical impact of trace elements in blood and end stage renal disease patient's tissues vivid (*Makhlough et al., 2014*).