

# **Study of Rheumatological Manifestations of Hepatitis C In Chronic Haemodialysis Patients**

*Thesis*

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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

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AASLD	American Association for the Study of Liver Diseases
ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
CDC	Center of Disease Control
CDNA	Complementary DNA
CG	Cryoglobulinemia
CI	Confidence Interval
CKD	Chronic kidney disease
CLD	Chronic liver disease
DMARDs	Disease-modifying antirheumatic drugs
DNA	Deoxyribonucleic acid
EDHS	Egyptian Demographic Health Survey
EIA	Enzymatic immune assay
EHM	Extra hepatic manifestations
ERBP	European Renal Best Practice Guidelines
ESRD	End stage renal disease
ETR	End of treatment response
EVR	Early viral response
FDA	Food and Drug Administration
GFR	Glomerular filtration rate
GN	Glomerulonephritis
HAI	History activity index
HAV	Hepatitis A virus
HBV	Hepatitis B virus
HCC	Hepatocellular carcinoma
HCM	Hypertrophic cardiomyopathy
HCQ	Hydroxychloroquine
HCV	Hepatitis C virus
HCVcAg	Hepatitis C core antigen
HD	Hemodialysis
HIV	Human immune deficiency virus

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## List of Abbreviations (Cont.)

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HTLV	Human T-lymphotropic virus
IDE	Integrated development environment
IDSA	Infectious Disease Society of America
IFN	Interferon
Ig	Immunoglobulin
IR	Insulin resistance
IRES	Internal ribosome entry site
IVDU	Intra venous drug users
KDIGO	Kidney disease improving global outcome
KDOQI	Kidney disease outcomes quality initiative
LHF	Lassa haemorrhagic fever
MCs	Mixed cryoglobulinemia syndrome
MENA	Middle East North Africa
MHD	Maintenance hemodialysis
MICS	Malnutrition inflammation cachexia syndrome
MIEC	Medanta independent ethics committee
MPGN	Membrano proliferative glomerulonephritis
MPGN	Mesangio proliferative glomerulo nephritis
MU	Million units
NANB	Non- A Non - B
NAT	Nucleic acid testing
NHANES	National Health and Nutrition Examination Survey
NHL	Non-Hodgkin lymphoma
NSAID	Non steroid anti- inflammatory drugs
OR	Odd ratio
PAT	Parental antischistosomal therapy
PBMC	Peripheral blood monocytes
PBMC	Peripheral blood mononuclear cell
PCR	Polymerase chain reaction
PCT	Porphyria cutanea tarda
PD	Peritoneal Dialysis

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## List of Abbreviations (Cont.)

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PN	Peripheral neuropathy
Pss	Primary Sicca syndrome(Sjögren's syndrome)
RA	Rheumatoid arthritis
RBV	Ribavirin
RdRp	RNA dependant RNA polymerase
RF	Rheumatoid Factor
RIBA	Reverse immuno- blot assay
RNA	Ribonucleic acid
RR	Relative risk
RRT	Renal replacement therapy
RT-PCR	Reverse transcriptase polymerase chain reaction
RVR	Rapid virological response
SLE	Systemic lupus eryromatosus
SOC	Standard of care
SPT	Skin prick test
SS	Sjogren's syndrome
SVR	Sustained viral response
TIPSS	Transjugular intrahepatic portosystemic shunt
TMA	Transcription mediated amplification
USPHS	United States Public Health Service
UTR	Untranslated region



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## **Introduction**

Hepatitis C virus infection is common in patients of end stage renal disease on chronic haemodialysis treatment and may be associated with poor clinical outcomes (**Gumber and Chopra, 2009**)

Hepatitis C virus causes significant morbidity and mortality among patients with end stage renal disease patients treated with chronic haemodialysis treatment. (**Lunel et al., 2008**)

Arthralgia, myalgia, and skin rash are common extrahepatic manifestations of end stage renal disease patients treated with haemodialysis treatment with hepatitis c virus infection. (**Ferri et al., 2008**)

Cryoglobulinaemia is one of the common extrahepatic manifestation of hepatitis C infection among patients with end stage renal disease treated with haemodialysis treatment. (**Rieu et al., 2008**)

The presence of cryoglobulins is usually associated with a more severe rheumatic manifestations (myalgia, fatigue, arthralgia and even arthritis). Arthralgia commonly affect the proximal interphalangeal and metacarpophalangeal joints of the hands, knee joints, and ankle joints. Musculoskeletal symptoms are described in more than 70% of persons with cryoglobulinemia. (**El-Serag et al., 2006**)

Cryoglobulins affect the nervous system in some HCV infected patients, the most frequent symptoms and signs are those of chronic sensory polyneuropathy. (**Bryce et al., 2009**).

"Meltzer's triad" of palpable purpura, arthralgia and myalgia is generally seen with polyclonal cryoglobulins seen in essential, viral, or connective tissue disease-associated cryoglobulin (**De Re et al., 2006**)

There is a correlation among cryoglobulins and musculoskeletal manifestations and hypocomplementemia (the complement profile often shows decreased levels of C4 and slightly lowered C3 in cryoglobulinaemia) (**Enomoto et al., 2008**).