PREVELANCE OF HCV Abs AMONG HAEMODIALYSIS PATIENTS IN EAST AREA [Sector (F)] CAIRO GOVERNERATE/EGYPT

Thesis

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BY

Ramy Ibrahim Abd-Rabo El Shafaay

M.B., B.Ch.

Under Supervision of

Prof. Dr. Mohmed El Tayeb Nasser

Professor of Internal Medicine and Nephrology
Faculty of Medicine - Ain Shams University

Prof.Dr.Magdy Mohmed Said El Sharqwy

Professor of Internal Medicine and Nephrology
Faculty of Medicine - Ain Shams University

DR. Sahar Mahmoud Shawky

Assitant Prof. of Internal medicine & nephrology
Ain shams university

Faculty of Medicine
Ain Shams University
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الملخص العربى

تعتبر الإصابة بالفيروس الكبدي الوبائي سي أكثر أمراض الكبد شيوعا بين مرضي الإستصفاء الدموي ، وتعتبر أمراض الكبد من أهم أسباب تدهور الحالة المرضية لمرضي الكلي المعالجون إما بالإستصفاء الدموي أو بزراعة الكلي.

2% من سكان العالم (حوالى 123 مليون نسمة) مصابين بالالتهاب الكبدي الفيروسي سي ،بينما تحتل مصر الصدارة بين دول العالم في معدل الإصابة بالفيروس حيث تبلغ نسبة الإصابة حوالى 14.7% .

تختلف معدلات الإصابة بالفيروس الكبدي الوبائي سي بين مرضي الإستصفاء الدموي بين البلاد المختلفة علي مستوي العالم (5%-85%) و قد يتجاوز 95% في بعض وحدات الإستصفاء الدموي.

تتضمن هذه الدراسة كل مرضى الفشل الكلوى فى وحدات الاستصفاء الدموى المختلفة فى المنطقة الشرقية من محافظة القاهرة(1393 مريض) فى 37 وحدة استصفاء دموى فى المنطقة الشرقية من محافظة القاهرة . ويمثل الذكور 61.8% من المرضى .

توضح هذه الدراسة أن أهم أسباب الفشل الكلوى فى المنطقة الشرقية من محافظة القاهرة هو الضغط العالى بنسبة56.9%

تم تصنيف المرضى موضوع الدراسة على حسب الإصابة بالفيروس و وجد أن 1393/644 مريضا(46.2%) مصابون بالفيروس الكبدى سى، 27 مريض (1.9%) مصابون بالفيروس الكبدى الوبائى بى ، 1393/749 مريض (53.8%) خالين من الإصابة

قبل بداية الإستصفاء الدموى كان هناك 956 مريضا خالين من الإصابة بالفيروس و عند وقت الدراسة وجد 749 مريضا (78.3%) مازالوا خالين من الإصابة بينما 207 مريضا (21.7%) شهدوا تحولا إيجابيا فى الإصابة بالفيروس.

تم بحث العوامل المصاحبة للتحول فى الإصابة بالفيروس الكبدى الوبائى سى و وجد أن العمليات الجراحيه ، نقل الدم و تغيير مكان الإستصفاء الدموى

List of Abbreviations

ALT	: Alanine Transaminase.
AVF	: Arterio-Venous Fistula.
AVG	: Arterio-Venous Graft.
b-DNA	: Branched Deoxyribonucleic Nucleic Acid
BSIs	: Blood Stream Infections.
CDC	: Centers for Disease Control.
CHC	: Chronic hepatitis C
CKD	: Chronic Kidney Disease.
CMS	: Centers of Medicare, Medicaid services.
COPD	: Chronic Obstructive Pulmonary Diseases.
CVC	: Central Vascular Catheter.
DC-SIGN	: Dendritic Cell-Specific Intercellular adhesion molecule3-Grabbing Nonintegrin.
DNA	: Deoxyribonucleic acid.
DOPPS	: Dialysis Outcomes and Practice Pattern Study
EDHS	: Egyptian Demographic Health Survey.
ELISA	: Enzyme Linked Immunosorbant Assay.
EPA	: Environmental Protection Agency.
EPO	: Erythropoietin.
FDA	: Food and Drug Administration.
FIFRA	: Federal Insecticide, Fungicide and Rodenticide Act.
GN	: Glomerulo Nephritis.
KDIGO	: Kidney Disease Improving Global Outcomes.
HBV	: Hepatitis B Virus.
HBs-Ag	: Hepatitis B Virus surface Antigen.
HCV	: Hepatitis C virus.
HCV-Abs	: Hepatitis C virus-Antibodies.
HCP	: Hexagonal close-packed
HD	: Hemodialysis.

List of Abbreviations (Cont.)

HIV	: Human Immuno-Deficiency Virus.
HLA	: Human Leukocytic Antigen.
HRS	: Hepato-Renal Syndrome.
HTN	: Hypertension.
IFN	: Interferon.
LDL	: Low Density Lipoprotein.
MPGN	: Membrano-Proliferative Glomerulo Nephritis
NHANES	: National Health And Nutrition Examination Survey.
NHSN	: National Healthcare Safety Network.
PCR	: Polymerase Chain Reaction.
PCK	: Poly Cyctic Kidney.
PEG- IFN	: Pegylated Interferon.
RBV	: Ribavirin.
RCTs	: Randomized controlled Trials.
RNA	: Ribo-Nucleic Acid.
RR	: Relative Risk.
RT- PCR	: Reverse Transcriptation Polymerase Chain Reaction
SD	: Standard Deviation.
SLE	: Systemic Lupus Erythromatosis.
SR-BI	: The scavenger receptor class B type I.
SVR	: Sustained Virologic Response.
TMA	: Transcription-Mediated Amplification.
WHO	: World Health Organization.

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The most recent WHO estimate of the prevalence of hepatitis C virus (HCV) infection is 2%, representing 123 million people. HCV is the leading cause of liver transplantation in developed countries ***(Colin et al., 2005)***.

Egypt has the highest countrywide prevalence of HCV infection in the world and the prevalence of antibodies to HCV is 10-fold greater than in the United States and Europe. Chronic hepatitis C (CHC) is a major Health concern worldwide and although often clinically silent, is histologically an insidiously progressive disease leading to liver fibrosis and hepatocellular carcinoma (HCC). Several laboratory parameters used either alone or in combination, scores and indices have been proposed and evaluated for non-invasive prediction of hepatic fibrosis in patients with CHC***(Attallah et al ., 2006)***.

Infection with HCV is the most common liver disease in hemodialysis patients, while liver disease is a significant cause of morbidity in patients with end stage renal disease treated by dialysis or transplantation ***(Fabrizi et al., 2002).***

The prevalence of anti-HCV positivity among dialysis patients varies in different countries (5%-85% worldwide), but may exceed 95% in some HD units ***(Al Traif et al., 2000).***

In Egypt, ***Afifi et al***. had reported a prevalence of HCV antibodies in HD patients ranging from 52.3 to 82.3% ***(Afifi et al., 2008).***

The transmission of the virus to HD patients is generally

nosocomial with possible risk factors being failure to disinfect devices between patients, sharing of single-use vials for infusions, poor sterile technique, poor cleaning of dialysis machines, and poor distance between chairs ***(Zampieron et al., 2004).***

Some investigators suggested a decline in HCV prevalence among HD patients in recent years, mostly attributable to strict adherence to universal precautions with or without observing isolation measures ***(Valtuille et al., 2002 and Saxena, 2003).***

Aim of The Work

The aim of this study was to assess the prevalence of HCV antibodies among HD patients in East Area In Cairo Governorate Sector F.

Chapter 1
Natural history of Hepatitis C Virus

Since its discovery in 1989, hepatitis C virus (HCV) has been recognized as a major cause of chronic liver disease worldwide. The most recent WHO estimate of the prevalence of HCV infection is 2%, representing 123 million people. HCV is the leading cause of liver transplantation in developed countries, and the most common chronic blood borne infection in the USA ***(Colin et al., 2005)*.**

Hepatitis C virus remains a large health care burden to the world. Incidence rates across the world fluctuate and are difficult to calculate given the asymptomatic, often latent nature of the disease prior to clinical presentation. Prevalence rates across the world have changed as well with more countries aware of transfusion-related hepatitis C and more and more evidence supporting intravenous drug use as the leading risk factor of spread of the virus ***(Miller & Abu-Raddad, 2010).***

There have been many controversies around the issue of the natural history of hepatitis C. The disease has been described as either inexorably progressive towards fibrosis and its complications, albeit over a quite long period of time, or as a benign and non-progressive chronic infection in the vast majority of HCV carriers. Recently, it has been recognized that these discrepancies reflect the great heterogeneity of hepatitis C as to its severity and outcome and to the many cofactors that can influence its course and progression A general view of the

natural history of hepatitis C is given in Figure.1 ***(Alberti et al., 2005).***

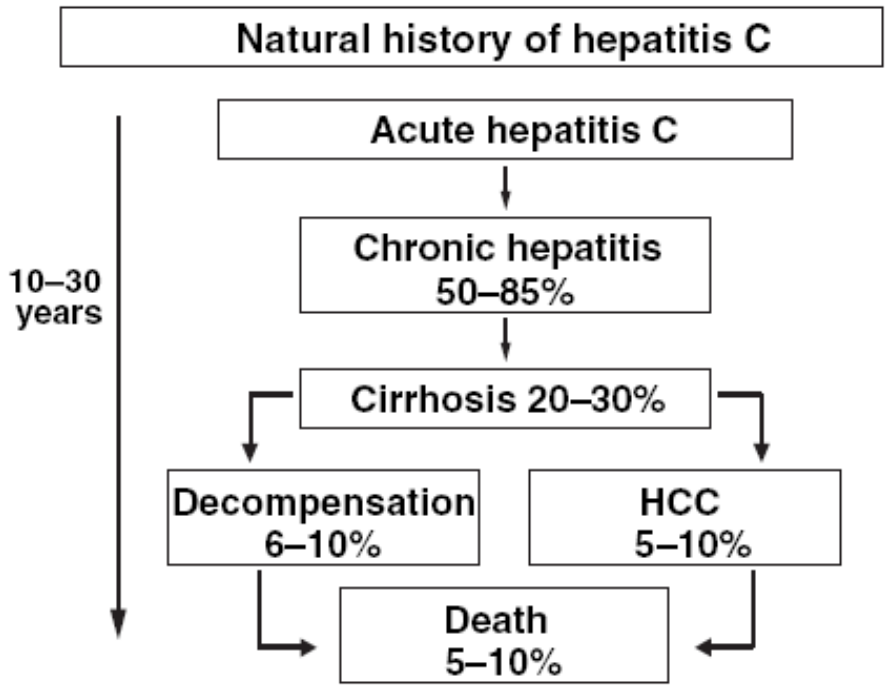

Figure (1): General view of the natural history of hepatitis C ***(Alberti et al., 2005).***

1. HCV structure:

Hepatitis C virus (HCV) is a small (55-65 nm in size), enveloped, positive-sense single-stranded RNA virus of the family *Flaviviridae*. Although hepatitis A virus, hepatitis B virus, and hepatitis C virus have similar names (because they all cause liver inflammation), these are distinctly different viruses both genetically and clinically. Hepatitis C virus is the cause of hepatitis C in humans ***(De Beek & Dubuisson, 2003).***

The HCV genome is an uncapped, linear molecule with a length of 9600 nucleotides. It carries a long open reading frame that is flanked at the 5 and 3 ends by short highly structured non-translated regions (NTRs). The 5 NTR has a length of about 340 nt and contains an internal ribosome entry site (IRES) required for translation of the HCV genome ***(Bartenschlager et al., 2004).***

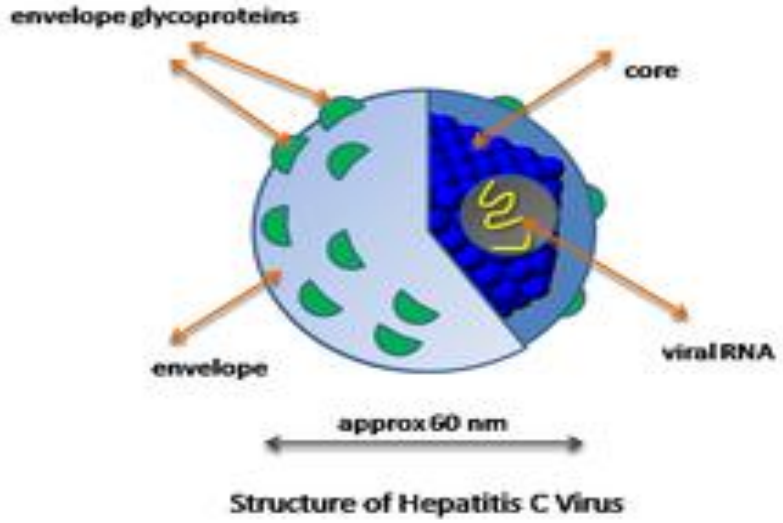

Figure (2): Simplified diagram of the structure of the Hepatitis C virus particle ***(Bartenschlager et al., 2004)***.

Replication of HCV involves several steps. The virus replicates mainly in the hepatocytes of the liver, where it is estimated that daily each infected cell produces approximately fifty virions (virus particles) with a calculated total of one trillion virions generated. The virus may also replicate in peripheral blood mononuclear cells, potentially accounting for the high levels of immunological disorders found in chronically-infected HCV patients. HCV has a wide variety of genotypes and mutates rapidly due to a high error rate on the

part of the virus' RNA-dependent RNA polymerase ***(Bartenschlager & Lohmann, 2000)***.

The mutation rate produces so many variants of the virus. It is considered a quasispecies rather than a conventional virus species. Entry into host cells occur through complex interactions between virions and cell-surface molecules CD81, LDL receptor, SR-BI, DC-SIGN, Claudin-1, and Occludin ***(Zeisel et al., 2009 ; Kohaar et al., 2010).***

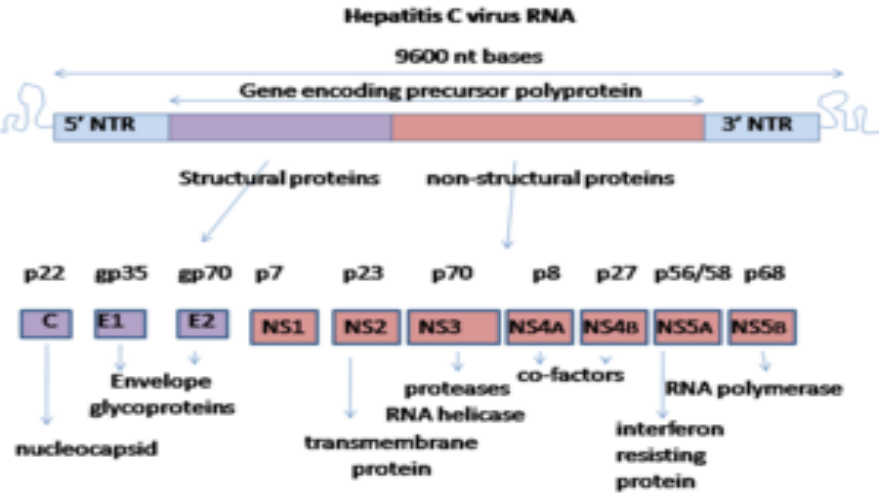

Figure (3): HC virus RNA ***(Kohaar et al., 2010).***

2. Transmission:

The following are the currently known modes of transmission. There may be other, as yet unknown, means of transmission

A) Injection drug use:

Injection drug use currently is the most common mode of HCV transmission in the united state; the proportion of acute cases who reported injection drug use increased from