RISK ASSESSMENT OF HCV SEROCOVERSION IN HEMODIALYSIS PATIENTS

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تقييم مخاطر العدوى بالفيروس الكبدي الوبائي سي في مرضي الغسيل الكلوي

رسالة

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Summary

Hepatitis C virus infection has recently become the major cause of chronic liver disease among patients on chronic HD who are at high risk of infection by HCV. Risk factors as dialytic age, blood transfusion and possibility of nosocomial HCV transmission have been suggested.

Preventing HCV infection, the most important public health issue in HD units in Egypt. This means stopping or reducing the transmission of HCV from an infected person to a person who is not infected.

The aim of this study was to determine the risk factors of HCV seroconversion in two HD units in upper Egypt, and to determine the effect of isolation policy on the incidence of HCV seroconversion in both units as well as evaluation of infection control measures.

Our study included 80 chronic HD patients divided to two groups: Group of no isolation of HCV seropositive patients (group A), this group included 45 patients, and group of isolation (group B), included 35 patients. All included patients had complete files and remain on HD for more than 2 consecutive serology tests. The patients enrolled in the study

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List of Abbreviations

ALT ..... Alanine transaminases

CDC ..... Center of disease control

CTC ..... Cytotoxic T cells

CVC ..... Central venous catheter

CXCL10...C-X-C motif chemokin 10

EDHS ..... Egyptian demographic health survey

EIA ..... Enzyme immunoassay

ERBP ..... European renal best practice.

ESRD ..... End stage renal disease

FDA ..... Food and drug administration

HBV ..... Hepatitis B virus

HCV ..... Hepatitis C virus

HD ..... Haemodialysis

HIV ..... Human immune virus

IC ..... Infection control

IL ..... Interleukin

INF ..... Interferon

IP-10.....Interferon gamma-induced protein-10

KIDGO .. Kidney international disease improving global outcome.

KDOQI… kidney disease outcome quality initiatives.

MENA ... The middle east and north Africa

MHC ..... Major histocompatability complex

NAT ..... Nucleic acid test

NIH ..... National institute of health

NS ..... Non structural

PCR ..... Polymerase chain reaction

PPE ..... Personal protective equipments

RO ..... Reverse osmosis

STD ..... Sexual transmitted diseases

SVR ..... Sustained virological response

TH ..... T helper

TMA ..... Transcription-mediated amplification.

TNF ..... Tissue necrosis factor

USPSTF.. US preventive services task force.

UVGI ..... Ultraviolet germicidal irradiation.

WHO ..... World heath organization

Introduction

End stage renal disease (ESRD) Patients have been increased in the last decade, leading to rapid increase in haemodialysis units. Within these units patients may suffer many risks; one of the most important risks is infection. Viruses are considered from the most important causative agents of infection in haemodialysis units, one of these viruses is hepatitis C virus (HCV) which is a major complication among haemodialysis patients allover the world **(Furusyo et al., 2000).**

Hepatitis C virus infection is the most common cause of chronic hepatitis in haemodialysis patients therefore liver disease is a significant cause of morbidity and mortality among ESRD patients **(Fabrizi et al., 2002).**

Prevalence of Anti-HCV antibody among haemodialysis patients is constantly higher than in healthy populations, suggesting that dialysis patients may be at higher risk for acquiring HCV. The major risk factor for HCV infection in haemodialysis patients are blood transfusion, the number of blood transfusions and duration of dialysis **(Dussol et al., 1996).**

Prevention of HCV infection, the most important public health issue in Egypt is to prevent people from getting infected

with HCV. This means stopping or reducing the transmission of HCV from an infected person to a person who is not infected. It is also very important to learn how to avoid iatrogenic infection **(Karmochkine et al., 2006).**

Iatrogenic transmission of HCV is possible when disinfection and sterilization techniques are inadequate and contaminated equipment is shared among patients. In particular, studies have shown that HCV infection can occur among patients on haemodialysis, due to poor infection control, and the sharing of contaminated medical vials and supplies **(Frank et al., 2000).**

Routes other than blood transfusion play a role in the spread of HCV in haemodialysis patients, Molecular studies of HCV implicate nosocomial transmission of the virus in haemodialysis units **(Alfurayh et al., 2000).**

Lack of strict adherence to standard precautions by staff and sharing of articles (such as multidose vials, tourniquets, etc) may be the main mode of nosocomial HCV spread among haemodialysis patients **(Jadoul et al., 2000).**

The isolation of HCV-infected patients is not recommended as an alternative to strict infection-control procedures for preventing transmission of blood-borne pathogens. If nosocomial transmission continues to occur, despite reinforcement and audit of the precautions, a local

isolation policy may be deemed necessary. HCV infected patients should be treated by dedicated staff in a separate room, area, or shift, as there is no rationale for using dedicated machines. It should be realized that accepting the 'need' for isolation equates to accepting the impossibility of full implementation of basic hygienic precautions, a regrettable situation that entails the risk of transmission of pathogens other than HCV **(Allander et al., 2008).**

Some prospective observational studies have reported a reduction of HCV transmission after the reinforcement of basic hygienic precautions without any isolation measures. In particular one Belgian prospective multicenter study showed a reduction from 1.4% to 0% of a year incidence of seroconversion for HCV. This demonstrated that complete prevention of HCV transmission to HD patients was possible in the absence of any isolation policy **(Jadoul et al., 2000).**

Additional arguments against relay on the use of isolation to prevent transmission of HCV include the possibility of increased the risk of HCV infection with more than one genotype and the time of HCV infection and seroconversion **(Scoroeter et al., 2005)**.

On the other hand the seroconversion time "window" can be over a year**,** and has a median length of 5 months in HD patients even with third generation EIA tests. This will result in