Assessment of Myocardial Functions in Patients with Hepatitis C Viral Infection

Thesis submitted for partial fulfillment of the master degree in cardiology

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LIST OF CONTENTS

LIST OF ABBREVIATION

ALT	Alanine transaminase
ARVC	arrhythmogenic right ventricular cardiomyopathy
AST	Aspartate transaminase
AT	Acceleration time
CHD	Coronary heart disease
CMR	Cardiovascular magnetic resonance
CO	Cardiac output
CT	C.Computed tomography (CT):
DCM	Dilated cardiomyopathy
DT	deceleration time
EBCT	electron beam computed tomography
EF	ejection fraction
ELISA	Enzyme liked Immune. Sorbant assy
IVRT	Isovolumetric Relaxation time
IVSD	interventricular septal diastolic.
LVEDD	Left ventricular End diastolic Diameter
LVPWD	left ventricular posterior wall diastolic
MDCT	Multi-detector computed tomography
MRA	magnetic resonance angiography
PCR	Poly chain regain
RF	Radiofrequency
RIBA	Recombinant Immunobult assy test
SPECT	Single photon emission computed tomography
TDI	Tissue Doppler Imaging

LIST OF THE TABLES

LIST OF THE FIGURE

Assessment Of Myocardial Functions In Patients With Hepatitis C Viral Infection

Introduction

Many cases of unexplained systolic and diastolic dysfunctions of the Heart in several patients seeking for care in cardiology unit. During assessment of these patients had given history of hepatitis C viral infection documented by investigations. This was beyond for screening of hepatitis C patients for myocardial dysfunction especially with increasing of hepatitis C virus in Egyptian community. Egypt has the highest HCV prevalence world wide, rural areas have the highest level of infection. In rural areas of the Delta prevalence rate is around 24% HCV positive antibodies and 19% in Cairo ***(Magder Ls, Medhat A, 2005).***

Hepatitis C virus was firstly called parenterally transmitted NoN-A NON-B Hepatitis virus until the virus isolated in 1988 in California using recombinant DNA technology and was given name hepatitis c. Hepatitis c spread by blood to blood contact, sexual transmission is occur rarely in less than 5% of couples. Transmission from mother to fetus occur but breast feeding is safe ***(Kevin mathias, 2007).***

The importance of hepatitis C virus (HCV) infection has been recently noted in patients with cardiomyopathies. HCV- RNAs

were found in the hearts of patients with cardimyopathies, and negative strands of HCV replicates in myocardial tissues. ***(Matsumori, 1999)***.

Myocarditis is thought to be commonly caused by various viruses, and accumulating evidence links viral myocarditis with the eventual development of dilated cradiomyopathy. ***(Matsumori, et al., 1995).***

Recent studies suggest that hepatitis C virus (HCV) is involved in the development of dilated cardiomyopathy, hypertrophic cardiomyopathy and arrhythmogenic right ventricular cardiomyopathy in addition to myocarditis. Furthermore, left ventricular aneurysm represents the same morbid state not only after myocardial infarction but also after myocarditis. It might be expected that interferon (INF) treatment would be useful for the treatment of myocardial damage caused by HCV. Patients receiving INF treatment of hepatitis were screened by thallium myocardial scintigraphy, and an abnormality was discovered in half of patients. Treatment with INF resulted in disappearance of the image abnormality.

It has been suggested that mild myocarditis and myocardial damage may be cured with INF. It had been found that high concentrations of circulating cardiac troponin T are a specific marker of cardiac involvement in HCV infection, the prevalence of cardiac involvement in HCV infection will be clarified. ***(Matsumori, 2006).***

Aim OF Work

The aim of the work is to assess myocardial functions in Egyptian patients with HCV infection compared with quite normal individuals.

Review of the study
HCV Infection and heart

Introduction:

HCV was Isolated in 1988 at chiron corporation in california using Recombinant R.N.A technology. ***(Tibbs & smith; 2001).***

Hepatitis C virus Infects 120 million world wide. ***(leone Rizzetto; 2005)***.

Egypt has the highest prevalence of HCV in the world due to pervious mass parenteral Anti-schitosomal therapy**.** ***(Deffic et al; 2006).***

HCV is the most common cause of chronic liver Disease in Egypt, where the prevalence of Anti bodies to HCV is 10 – fold greater than on united states ***(Stricland et al; 2002).***

HCV has at least six genotypes of which HCV: 1 and 2 are the major genotypes world wide and there is marked variability in the predominance of HCV genotypes. In the Different of world, Type 4 HCV is the most prevalent in Egypt ***(Zekri et al; 2001).***

Route of Infection:

The most common route of infection repeated percutanous exposures such as transfusion, transplantion from Infected donor or intravenous drugs, transmission also occur from contacts with infected subjects in the household through perinatal and parenteral exposures in the care setting. the risk of sexual transmission is low ***(Pellicano et al; 2004).***

Natural History of HCV Infection:

The Incubation period of HCV [5 – 52 weeks].

The acute presentation is Rare. Persistant viremia is the most Important features of HCV. There is no clinical and physical features specific to viral Hepatitis. The diagnosis depends on group of finding which taken together Indicate presence of Inflammation of the liver. Viral Hepatitis may be present without any clinical signs or symptoms (Asymptomatic), with non specific symptoms without Jaundice or with symptoms that occur with Jaundice. ***(Tibbs & smith; 2001).***

The mechanism by which the HCV Induce liver fibrosis Remains obscure HCV genes Induce an Increase Expression of Transforming growth Factor Beta 1 and other Fibrogenic Factros in Infected Hepatocyte. The Direct Induction of fibrogenic mediators by HCV in the Infected Hepatocytes

Explains the frequent observation of progression liver fibrosis despite low level of Inflammation. ***(Korenaga et al; 2005).***

The liver plays central Role in the clotting process. In the acute & chronic liver Diseases are Invariable associated with co-agulation Disorders Due to: Decrease synthesis of clotting factors, quantitative and qualitative platelet Defects, hyperfibrinolysis and accelerated Intravascular. coagulation. The Bleeding Tendency accounts for Increased Risk of morbidity and mortality. ***(Amitrano et al; 2002).***

Patient with liver cirrhosis have fluid & electrolytes abnormalities that manifested By Development of Ascites and Edema, Ascites is the most common complication of liver cirrhosis. Patients with advanced liver cirrhosis and portal hypertension often show an Important manifestation of the Disease. ***(Cordenas et al; 2001).***

Liver cirrhosis in the advanced state is associated with protein loss and manifested By loss of muscle mass, hypoalbuminemia. The protein loss condition is associated with poor prognosis and Reduced survival***. (Tessari P et al; 2003).***

Extra-hepatic syndrome of HCV.

There is a growing evidence to suggest that HCV can Replicate in Extrahepatic Tissue and cell types as peripheral Blood Mononuclear cells and this may support HCV Replication. The Extra hepatic tissues may act as Reservoir for HCV and play Role in Both Reactivation and persistence of Infection. ***(Blackard et al; 2006).***

Fever, fatigue, Artheralgia, urticaria, and Hematological Disorders with transient Bone marrow suppression, may be present and vasculitis is Rare complication. ***(Spangenberg & Blum 2006).***

HCV is associated with Increased Atherosclerosis and more than 20% of people with HCV Infection are associated with Diabetes mellitus which is an Important Risk Factor of cardiovascular Disease. ***(Matsumari et al; 2004).***

1-Laboratory Diagnosis of HCV:

the current diagnostic tests to demonstrate HCV Infection are classified in to:

1- serological tests for detection Anti bodies.

2-molecular Examination to Identify viral particles.

The serological screening Includes the Enzyme linked Immune -Sorbant assay [ELISA] and Recombinant Immuno -