

Risk of Structural Heart Diseases in Non-Alcoholic Fatty Liver Disease

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ABSTRACT

Aim: To observe cardiovascular, arrhythmic and cardiac issues in non-alcoholic fatty liver diseases patients.

Methods: A total 945 hospital admitted patients were previously diagnosed as non-alcoholic fatty liver diseases patients. Patients with viral hepatitis, drug induced liver diseases, cirrhosis of different etiology or many other comorbid conditions were included. Patients were mark as hypertensive, which have blood pressure $\geq 142/94$ mmHg. Detailed history of comorbid conditions and use of medications was obtained.

Results: All patients already diagnose as non-alcoholic fatty liver diseases patients. Mean age was 57 years and duration of diseases is almost 8 years. There are almost 367 patients with persistent heart block verified on standard ECGs. More securely 134 patients had a first degree AV block. This leads towards the amendment of many physiological processes, such as disruption in glucose balance, changes in fatty acids and lipoproteins, endothelial dysfunction and slowly progression towards atherosclerosis.

Conclusion: Non Alcoholic Fatty Liver Disease patients have high incidence of structural heart diseases and one of the leading cause of morbidity and mortality with adverse hepatic patient results. Quick attention should be paid towards this high cardiovascular risk.

Keywords: Structural Heart Diseases, Non Alcoholic Fatty Liver Diseases, Liver.

INTRODUCTION

In young, Pakistani population obesity is increasing many folds in past decades. Excess body fat prompt population to many chronic and incurable diseases like nonalcoholic fatty liver disease (NAFLD), coronary artery disease and diabetes¹. NAFLD is one of the leading common reasons of chronic liver disease in Pakistan².

Therefore, patient with NAFLD are at heavy risk factors leading to worse the atherosclerosis, it is alleged that patients with NAFLD are at great risk to develop the cardiovascular diseases³.

Many predictable risk factors increase structural heart diseases including hypertension, age, diabetes, physical activity, smoking, hyperlipidemia, diet and metabolic syndrome⁴. There are many new risk factors which is leading cause to developed structural heart diseases⁵. The main common denominator for NAFLD and Structural heart diseases is obesity, it is increasing in almost all age groups in Pakistan⁶.

The patients with proven with NAFLD should have long follow up regarding physiological changes in condition of patient, structural heart diseases

speedily become the most common cause of deaths in Pakistan after cancers patients⁷. On the other hand, there are many cultural risk factors such as diabetes and hypertension, it is now worldwide accepted that structural heart diseases and metabolic syndrome like NAFLD is involved in inflammatory process and leading to impairment of homeostatic mechanisms⁸.

Present studies showed high sensitivities of C-reactive protein (CRP) in order to early predict the structural heart diseases⁹. Prominently, it is proved by many health professionals CRP have been shown to conjugate with fibrosis and inflammation with high degree in patients with NAFLD¹⁰.

The objective of this research study is to observe cardiovascular, arrhythmic and cardiac issues in non-alcoholic fatty liver diseases patients.

MATERIAL AND METHODS:

This case control study was conducted in the Department of Cardiology, Jinnah Hospital, Lahore during a period of six months from January 2017 to June 2017. A total 945 hospital admitted patients were previously diagnosed as non-alcoholic fatty liver diseases patients. Patients with viral hepatitis, drug induced liver diseases, cirrhosis of different etiology or many other comorbid conditions were included. There are many different pattern have been utilized for progression of stimulated vascular changes in

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patients with NAFLD, including physiologic alterations, diabetics, chronic inflammation and anticoagulant risk factors. All these variations may appear in same patients, which is totally alter the patients treatment plan. Data were calculated in standard deviation and inter-quartile ranges. Differences on clinical, laboratory and electrocardiogram characteristics of variables were taken using the t-test.

Patients were marked as hypertensive, which have blood pressure $\geq 142/94$ mmHg. Detailed history of comorbid conditions and use of medications was obtained. Serum liver enzymes, different electrolytes and many others biochemical blood measurements were taken by utilizing standard laboratory procedures. Non-invasive fibrosis scores were counted only with different subgroups of patients with NAFLD. NAFLD regardless of its severity, is strongly linked with hepatic and adipose tissue changes.

Structural heart diseases was measured by the history of myocardial infarction, angina, coronary revascularization and electrocardiographic abnormalities. Any type of pre-existing history of any structural heart diseases, including symptoms and electrocardiograms. In many patients, the diagnosis of diabetic complications were also found.

RESULTS

All patients already diagnose as non-alcoholic fatty liver diseases patients. Mean age was 57 years and duration of diseases is almost 8 years. There are almost 367 patients with persistent heart block verified on standard ECGs. More securely 134 patients had a first degree AV block. Patients with NAFLD are male mostly, higher BMI values, hypertensive, high triglycerides, Lower HDL-cholesterol level and low hemoglobin. On the other hand, period of diabetes, incidence of prior heart diseases, complication microvascular type and the longterm use of glucose lowering agents and use of anti-hypertensive drugs have significant enhancing the chances of structural heart diseases.

This leads towards the amendment of many physiological processes, such as disruption in glucose balance, changes in fatty acids and lipoproteins, endothelial dysfunction and slowly progression towards atherosclerosis. The occurrence of hypertension, use of alpha blockers and smoking history were also to much high in pts with NAFLD.

DISCUSSION

In our study, we find many new findings as follows: patients with simultaneous structural heart diseases

and NAFLD had at high risk of heart block, the risk of any type of heart block was specifically increased in those patients which have advanced stage of NAFLD fibrosis with more than 5 years of diseases history and NAFLD was linked with many folds of increased risk of any continuous pressure on cardiac normal functions, which is going to be adverse with age, sex and with other secondary diseases¹¹.

According to our information, this the largest longitudinal study in Pakistan in which details of almost all the risk factors leading to structural heart diseases in NAFLD patients is sort out¹². NAFLD patients with diabetes mellitus is high risk to develop structural heart diseases¹³. Because diabetes mellitus has high incidence rate in patients with NAFLD¹⁴. Complete management and prevention in patients with NAFLD is beyond the scope of this study¹⁵.

According to our findings and results and the same conclusion by Mangi et al. in case study on 408 hospitalized patients with NAFLD, most of the patient have frequently admitted in hospitals due to developing complications with the passage of time¹⁶. Remarkably, the authors finding with NAFLD was directly linked with the presence of any cardiac issues and changes on ECGs. They also found that Diabetes is closely related to adverse the symptoms of patients with NAFLD¹⁷.

The basic pathophysiology of almost all the risk factors of NAFLD developing structural heart diseases are not complete understood yet. It still uncertain, how it going to be complicated with passage of time¹⁸. Many studies hypothesized that NAFLD is major risk factor to lead the development of structural heart diseases, which accompanies the variations in cardiac and rhythmic processes¹⁹. An understandable point of all these results is that the relationship between NAFLD and structural heart diseases has shows the relationship between many cardiovascular diseases and comorbidities with kidney and endocrinal problems²⁰. This results, therefore, leads towards the possibility that NAFLD may play significant role towards the development of structural heart diseases²¹.

As, it is clear from previous studies that NAFLD is not only singly responsible to increased the risks of cardiovascular diseases, but it is strongly associated with the presence of functional changes that may lead to the development of structural heart diseases²². By gathering many evidences from patient with NAFLD, changes with hepatic fibrosis play major role to cause the systemic production of multiple proinflammatory chemicals and thrombogenic molecules that are important in progression of structural heart diseases and other cardiovascular variations in the patients²³.

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