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Research Article

The Study of Hypertension among Patients with Non-Alcoholic Fatty Liver Disease (NAFLD)

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Abstract

Nonalcoholic fatty liver disease appears to be the most prevalent chronic liver disease among both adults and children. Evidences from recent studies indicated the correlation between NAFLD with other metabolic components which participate in pathogenesis of some systemic diseases like chronic kidney disease, cardiovascular disease, diabetes mellitus. As studies showed the notable mortality rate among NAFLD patients duo to cardiovascular disease, hypertension with tendency towards development and progression of NAFLD as well as causing cardiovascular disease, was studied in this article. Among NAFLD patients included in this study, 35% had hypertension. Also, obesity was observed in 32% of cases. Considering obesity-induced hypertension besides its comorbid conditions, this study results showed controlling hypertension with appropriate blood pressure medications aid to diminish liver steatosis. Moreover, losing weight in obese and overweight hypertensive NAFLD patients was found to effectively improve their condition.

Keywords: *Non-Alcoholic Fatty Liver Disease; Hypertension; Cardiovascular Disease; Obesity; Risk Factor*

Introduction

Non-Alcoholic Fatty Liver Disease (NAFLD) as the most prevalent chronic liver disease among developing and developed countries has become a health care crisis. NAFLD is globally detected in 25 - 30% of adult in western countries [1]. With imitating western lifestyle consisting eating habits among developing countries, the incidence and prevalence of NAFLD as well as its related comorbidities such as cardiovascular disease, chronic kidney disease, diabetes mellitus and obesity, among eastern countries raised up recently. NAFLD is a condition in which triglyceride accumulates in hepatocyte, more than 5 - 10% of liver weight [2]. Other than alcohol, liver damage can be also caused by viruses. In the diagnosis of NAFLD, other conditions inducing liver damage should be ruled out. Since, NAFLD remains asymptomatic in mostly cases, catching this liver disease with life threatening complications, in the stage of onset, should be mentioned by practitioner in susceptible individuals with precursor conditions like insulin resistance, obesity, sedentary life, hyperlipidemia, hypertension as well as considering genetic predisposition in individuals with affected family members [3].

However, data from several recent studies indicated hypertension and NAFLD are independent risk factors for developing cardiovascular disease (CVD), also, it is well established that coexistence of some underlying conditions like obesity and insulin resistance besides high blood pressure, as components of metabolic syndrome, predispose individuals to some chronic conditions like diabetes mellitus, non-alcoholic fatty liver disease and coronary artery disease with increasing the susceptibility of pathogenesis of CVD as well [4].

Regarding the association between hypertension and development and progression of NAFLD as a hepatic manifestation of metabolic syndrome with prevalence of approximately 50% hyperlipidemia as well as 27% hypertriglyceridemia and 70% diabetes mellitus among

NAFLD patients [4,5], it could be perceived that patients detected with NAFLD appear to be enriched with several risk factors which can trigger atherosclerosis, as well as cardiovascular disease which eventually increase the mortality and morbidity rates among them [6].

Patients and Methods

In this ongoing 4 years study from 2015, members of Iranian families detected with NAFLD who presented to our clinic were participated in our study. Ultrasonography as a suitable, cost-effective, non-invasive imaging modality was used to detect non-alcoholic fatty liver disease [7]. NAFLD grading was determined by ultrasonography as well. Participants affected by viral hepatitis or other chronic liver diseases were excluded. Also, fasting serum levels of alanine transaminase (ALT), aspartate transaminase (AST), blood pressure, triglycerides, glucose and hemoglobin A1c (HbA1c) were assessed for all participants. The criteria for hypertension defined by theAmerican Society of Hypertension and the International Society of Hypertension included a systolic blood pressure ≥ 140 mmHg or a diastolic blood pressure ≥ 90 mmHg, or both [8]. Besides, data on physical activity and dietary habits was gathered regarding participants self-expression.

Result and Discussion

This study was conducted among 1720 patients diagnosed with NAFLD over 4 years. More proportion (58%) of this study population were female with mean age of 35. Hypertension was found in 35% of participants. Also, hyperlipidemia was detected in 78% of patients. In addition, diabetes mellitus was observed in 61% of cases. Moreover, considering BMI ≥ 25, it was found that 32% of individuals were obese and overweight. In addition, 47% of participants had low physical activity. Besides, 27% of patients had fast food more than twice a week. Since this study was performed among NAFLD patients, different grades of fatty liver included 894 (52%) with grade 1 fatty liver, 516 (30%) with grade 2 fatty liver and 310 (18%) with grade 3 fatty liver. Data on participants' characteristics is summarized in table 1.

			All individuals (n = 1720)
Sex, n (%)		Male	826 (42)
		Female	998 (58)
Age (years),	Median		35
	Range (min-max)		18-96
BMI,	Median		21
	Range (min-max)		14.5-58
Serum ALT (IU/L),	Median		30
	range (min-max)		15-80
Serum AST (IU/L),	Median		34
	Range (min-max)		18-85
Hypertension, n (%)		Yes	602 (35)
		No	1118 (65)
Hyperlipidemia, n (%)		Yes	1342 (78)
		No	378 (22)
Diabetes Mellitus, n (%)		Yes	1049 (61)
		No	671 (39)
NAFLD grade, n (%)		Grade 1	894 (52)
		Grade 2	516 (30)
		Grade 3	310 (18)

Table 1: *Characteristics of study population.*

n: Number; BMI: Body Mass Index; ALT: Alanine Transaminase; AST: Aspartate Transaminase; NAFLD: Non-Alcoholic Fatty Liver Disease.

Conclusion

Pharmacotherapy with blood pressure medications was performed for NAFLD patients with hypertension and these patients were followed up with repeating examination. Also, among NAFLD patients detected with hypertension who were obese and overweight, it was seen that losing weight, improve their condition.

It should be mentioned that as, obesity together with aging are risk factors for developing hypertension, practitioners should screen for this condition among these susceptible individuals to provide prevention as well as early detection and management. Also, with increasing prevalence of these metabolic conditions and their further complications with considering their economical and familial burden among patients, health care providers should educate individuals in terms of life style modification including more physical activity beside healthy dietary habits to effectively improve the quality of their life and actively participate in their care.

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