

Relation between non-alcoholic fatty liver disease and atherosclerosis

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Abstract

Non-alcoholic fatty liver disease (NAFLD) is one of the most common causes of chronic liver disease in the world, according to the World Health Organization. In terms of cardiovascular disease, NAFLD represent a risk factor. One of the best biomarkers of platelet activation and function is the mean platelet volume (MPV). MPV has been shown to be a risk factor for atherothrombosis and a predictor of cardiovascular disease. Mean platelet volume (MPV) has been shown to be a useful tool in assessing NAFLD patients' prognosis. Methods: After metabolic syndrome was ruled out, a prospective case-control study with 25 NAFLD patients and 25 healthy controls of the same age group was carried out. Before patients were enrolled, they signed an informed consent form. The research was given the go light by the Banha University Faculty of Medicine's Ethics Committee. Results: NAFLD patients had a considerably higher MPV than the control group. Conclusion: NAFLD is a risk factor for atherosclerosis and cardiovascular disease, according to the findings of this study.

Keywords: Non-alcoholic fatty liver disease, Mean platelet volume, cardiovascular risk.

1. Introduction

The prevalence of NAFLD in the general population is believed to range from 25 to 45 percent, making it the most common cause of chronic liver disease globally (1). As a consequence of the metabolic syndrome, it is thought to have an impact on the liver (2). There is a broad range of diseases that fall under the umbrella of NAFLD, from simple fat buildup to steatohepatitis (NASH) and cirrhosis. 5–10 percent of NAFLD patients will develop NASH, and 30 percent of those who develop NASH will develop cirrhosis, according to the National Institutes of Health (3). NAFLD has been linked to an elevated risk of cardiovascular disease (CVD) and cancer mortality (4,5). NAFLD's potential as a stand-alone risk factor for cardiovascular disease is still up for dispute.

Platelet activation and function may be measured by measuring the mean platelet volume (MPV). For cardiovascular disease, MPV has been shown to be a useful predictor and a risk factor for atherothrombosis (6). In NAFLD patients, MPV seems to be a major laboratory marker that rises dramatically. As MPV has

been linked to an increased risk of atherosclerosis in people with NAFLD, this measure may be beneficial in monitoring their progress (7).

2. Subjects and Methods

Following removal of potential confounding factors, such as evidence of metabolic syndrome, medication that interact with normal platelet functions, and patients with other liver illnesses, this investigation was done on 25 NAFLD subjects and 25 age-matched healthy control people. The patients gave their permission to participate in the study. The research was given the go light by the Benha University Faculty of Medicine's Ethics Committee.

3. Results

There were no significant differences between both groups regarding age, gender, marital status, residence, smoking, dyslipidemia and BMI.

MPV was significantly higher in NAFLD group (9.3 ± 1.2 fl) than the control group (8.2 ± 0.6 fl), and P-value was <0.001 .

Table (1) General characteristics in the studied groups:

		Group A (No = 25)	Group B (No = 25)	P-value
Age (years)	Mean \pm SD	41 \pm 9	37 \pm 9	0.094
Gender	Males n (%)	13 (52.0)	11 (44.0)	0.571
	Females n (%)	12 (48.0)	14 (56.0)	
Marital status	No (%)	19 (76.0)	18 (72.0)	0.747
Residence	Rural n (%)	10 (40.0)	14 (56.0)	0.258
	Urban n (%)	15 (60.0)	11 (44.0)	
Smoking	No (%)	7 (28.0)	5 (20.0)	0.508
Dyslipidemia	No (%)	1 (4.0)	0 (0.0)	1.0
Body mass index	Mean \pm SD	27.2 \pm 0.9	27.1 \pm 1.4	0.848

Table (2) MPV in the studied groups.

		Group A (No = 25)	Group B (No = 25)	P-value
MPV (fl)	Mean \pm SD	9.3 \pm 1.2	8.2 \pm 0.6	<0.001

NB: Normal range of MPV ~ 7-12 fl.

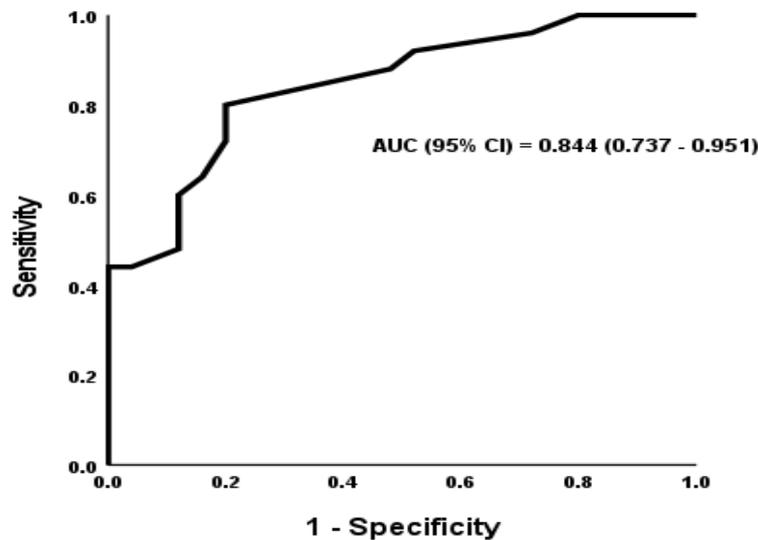
Table (3) ROC analysis of MPV for prediction of cardiovascular risk in patients with NAFLD.

ROC characteristics	
AUC (95% CI)	0.844 (0.737– 0.951)
Best cut-off	> 8.3
Sensitivity	80%
Specificity	80%
PPV	80%
NPV	80%
P-value	< 0.001

AUC: Area Under Curve **95% CI: 95% Confidence interval**

PPV; Positive predictive value

NPV; Negative predictive value

**Fig. (1)** ROC analysis for MPV.

Statistical Analysis

SPSS version 25 was used for data administration and statistical analysis. In the United States, IBM is based in Armonk, New York. The Shapiro-Wilk test and direct data visualisation approaches were used to examine quantitative data for normalcy. Means and standard deviations or medians and ranges were then used to summarise numerical data.

4. Discussion

Males (60–70 %) and those under the age of 50 are more likely to suffer from NAFLD (8). There were 13 male and 12 female participants in the study group and 14 male and 11 female participants in the control group, which was in agreement with Aygun et al., who reported that there were no significant differences between both groups for age and gender (9). There

were no significant variations in BMI between the two groups in this research. Saremi et al. observed that waist circumference, weight, and BMI were considerably greater in the NAFLD group compared to the healthy control group. This conclusion was in conflict with this study (7).

Madan et al, Saremi et al. and Nallathambi et al. all found that patients with NAFLD had greater MPV than those without, with P value < 0.001 suggesting enhanced platelet activity. In our investigation, MPV was considerably higher in group A than group B, which was consistent with their findings (7,10,11)

5. Conclusion

MPV may be beneficial in monitoring patients with NAFLD, since it seems to be higher in NAFLD patients.

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