AMERICAN ACADEMIC PUBLISHER

INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

ISSN NUMBER: 2692 - 5206 Volume 5. No 12. December ,2025

EARLY DETERMINATION RISKS OF ATHEROSCLEROSIS IN THE PATIENTS WITH METABOLIC ASSOCIATED FATTY LIVER DISEASE

Rasulova Z.D.,
Ibodulloev M.S.
Military Medical Institute of the Ministry of Defense of the Armed Forces of the Republic of Uzbekistan

Abstract: Metabolic associated fatty liver disease (MAFLD) is currently considered a widespread liver pathology in the world, and its presence is a significant risk factor for cardiovascular diseases. The main cause of death in patients with MAFLD is atherosclerotic cardiovascular diseases - heart attack and stroke. Therefore, early detection of subclinical atherosclerosis and timely prevention of cardiovascular complications in MAFLD is an urgent problem. The main attention is paid to military personnel, that is, the young and able-bodied population, as well as military personnel whose health condition affects the combat readiness of the army.

This article presents modern data on early markers of atherosclerotic processes in military personnel with MAFLD and methods for their assessment, mathematical indicators, and preventive measures. The novelties identified during the study provide recommendations for early detection of cardiovascular diseases among military personnel, improving their quality of life, reducing the incidence of liver pathology and treating them.

Keywords: Metabolic associated fatty liver disease (MAFLD), subclinical atherosclerosis, dyslipidemia, complex intima media (CIM), indices.

Relevance. Despite the significant improvement in atherosclerotic cardiovascular outcomes in recent decades, they remain the leading cause of morbidity and mortality worldwide. Metabolic-associated fatty liver disease (MAFLD) appears as one of the main risk factors in the origin of Atherosclerosis Disease. According to the World Health Organization, the average body weight index of the population of the Republic of Uzbekistan is 28.5 kg/m^2, and this is the highest indicator among the countries of Central Asia. Currently, between 17 to 46% of the world's population have MAFLD, a indicator predicted to be 15-56% by 2030. Numbers further confirm that steatosis has been observed in 5% of hepatocyte cells in MAFLD, which is shared with insulin resistance as well as metabolic syndrome, and affects human life expectancy with cardiometabolic risk. The health of citizens of the world is positively affected by early detection of the risk of cardiovascular diseases, their prevention and Prevention of complications in patients with MAFLD.

Material and methods. Has been checked population with metabolic associated fatty liver disease between the ages of 25-55 years and healthy population at this age. Detection of disease-causing harmful factors by survey, clinical examinations, laboratory – blood biochemical analysis, triglyceride, HDL, LDL, cholesterol, glucose, insulin, C reactive protein, instrumental noninvasive examination methods – ECG, Echo CG, abdominal organ ultrasound, vascular dopplerography, bioimpedance indicators and angioscan analysis, special risk factor detection indices(IVO, LAP, FIB-4, NAFLD Fibrosis score, HSI).

Visceral obesity indices (IVO)	[CW/(39,68+(1,88×BMI))× (TG/1,03)×(1,31/HDL)] — for men, [CW/(36,58+(1,89×BMI))×	This pointer has a normative BMI, CW, TG, HDL ratio of 1. The ratio high

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5. No 12. December ,2025

	(TG/0,81)×(1,52/HDL)] — for women.	indicator indicates high visceral obesity.
FIB-4	FIB-4 = age * AST/PLT * √ALT Age – age of patient PLT – platelet count 10^9 AST – Aspartatamino-transferaza U/l ALT – Alaninamino-transferaza U/l	FIB-4 ≥2.67 indicates the presence of obvious fibrosis (with 80% reliability); FIB-4 ≤ 1.3 fibrosis not present (with 90% reliability)
NAFLD Fibrosis Score	−1.675 + 0.037 × age (year) + 0.094 × BMI(kg/m2) + 1.13 × (impaired glucose tolerance or diabetes [yes=1, no=0]) + 0.99 × (AST/ALT ratio) − 0.013 × platelet (×10^9/l) − 0.66 × albumin (g/dl)	• <-1,455-low risk of apparent fibrosis; • -1,455- 0,67 – unspecified result; • >0,67-high risk of apparent fibrosis.
HSI (Hepatic steatosis index)	HSI = 8 × (ALT/AST ratio) + TVI + 2 (female) + 2 (QD available)	If the sense indicator is > 36.0-indicates the presence of liver steatosis in the patient (with sensitivity of 93.1% and specificity of 92.4% in AUROC 0.812 accuracy)
Lipid accumulation product, LAP	Determined by Kahn: LAP for men = (BA – 65) × TG, LAP for women = (BA – 58) × TG , CW – waist circumference (sm), TG triglycerides	The LAP index is a cheap, sensitive, and specific method for assessing MAFLD, and is relevant for MAFLD screening.

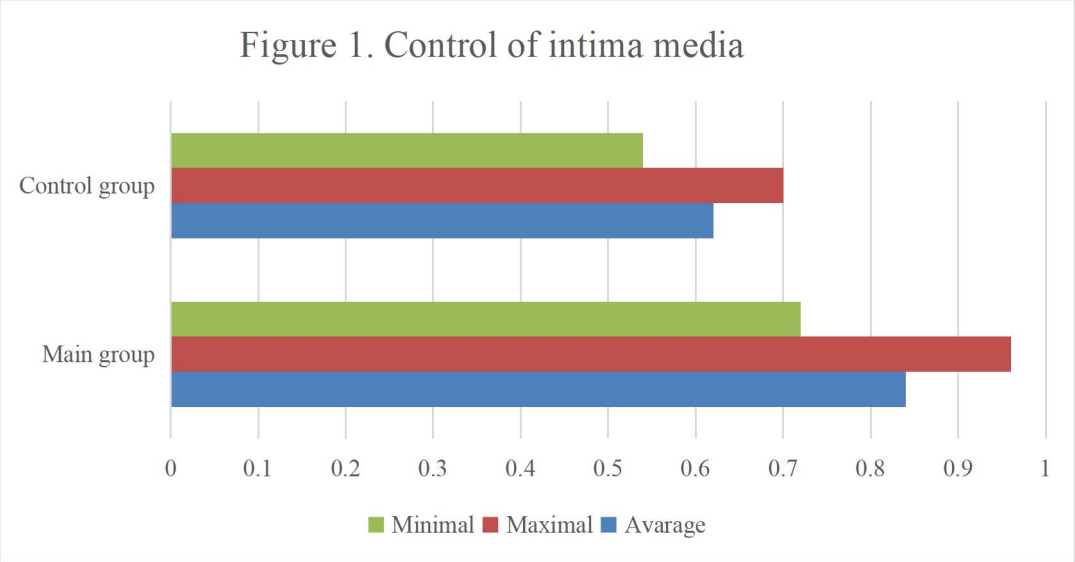
Research results. The diagnosis of metabolic associated fatty liver disease is confirmed in the following cases:

- in the examination of liver tissue in visualization methods;
- in the context of 1 or more factors of cardiometabolic syndrome;

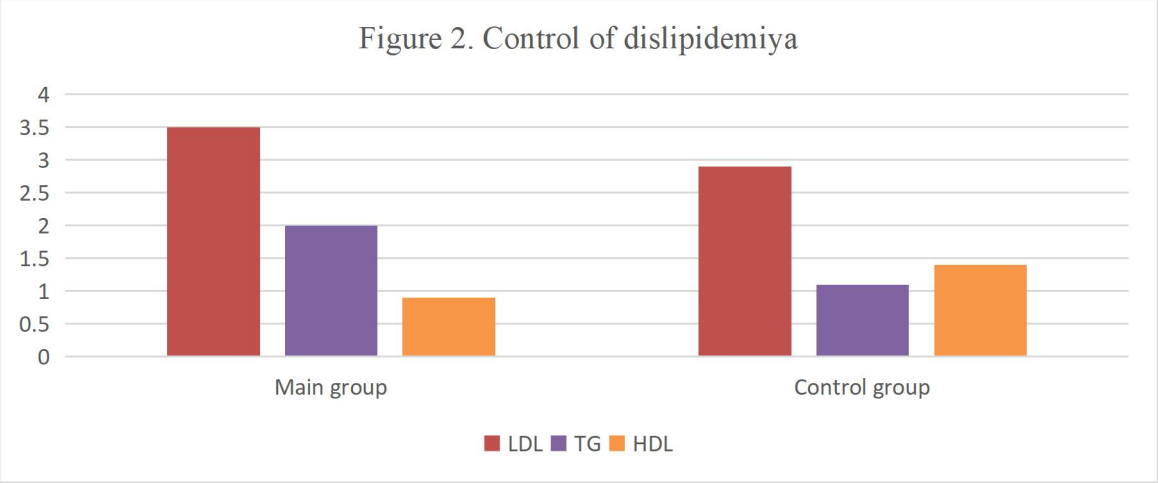
a) body weight index > 25 kg / m2, waist circumference > 94 cm (in men), > 80 cm(in women).
b) glucose content >5.6 mmol/l, hemoglobin A1C>5.7% and sometimes diabetes Type II patients who are confirmed and are in treatment effective indications;
d) arterial hypertension ≥130/85 mmhg with pharmacotherapy with confirmed hypertension;
e) triglyceride ≥ 1.7 mmol/l or against the background of lipid lowering treatment;
f) high density lipoprotein(HDL) content < 1.0 mmol/l in men, < 1.3 mmol/l in women or against the background of lipid lowering treatment.

Factors such as physical load, stress, dietary disorders, smoking and insomnia accelerate the development of MAFLD and atherosclerosis on the world's population. Analysis has shown that patients with metabolic associated fatty liver disease have a higher atherogenicity index, which is found to produce higher levels of atherosclerosis development in the trunk arteries earlier than healthy individuals in the control group. Patients in the main group with MAFLD trunk arteries who averaged 0.84 ± 0.12 mm in thickness, and 0.62 ± 0.08 mm in the control group. In addition, the average body weight index in the main group is 29.6 ± 3.2 kg/m2, and in the control group is 24.3 ± 2.8 kg/m2.

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5. No 12. December ,2025



The results of the examination showed that in the main group of patients, the density is low lipoprotein (LDL) 3.5±0.7 mmol/l, triglyceride 2.0±0.62 mmol/l, the density is high lipoprotein (HDL) 0.9±0.16 mmol/l, and in the control group these indicators are low lipoproteid (LDL) 2.9±0.65 mmol/l, triglyceride 1.1±0.5 mmol/l, the density is high lipoproteid (HDL) 1.4±0.21 mmol/L is considered to have shown results.

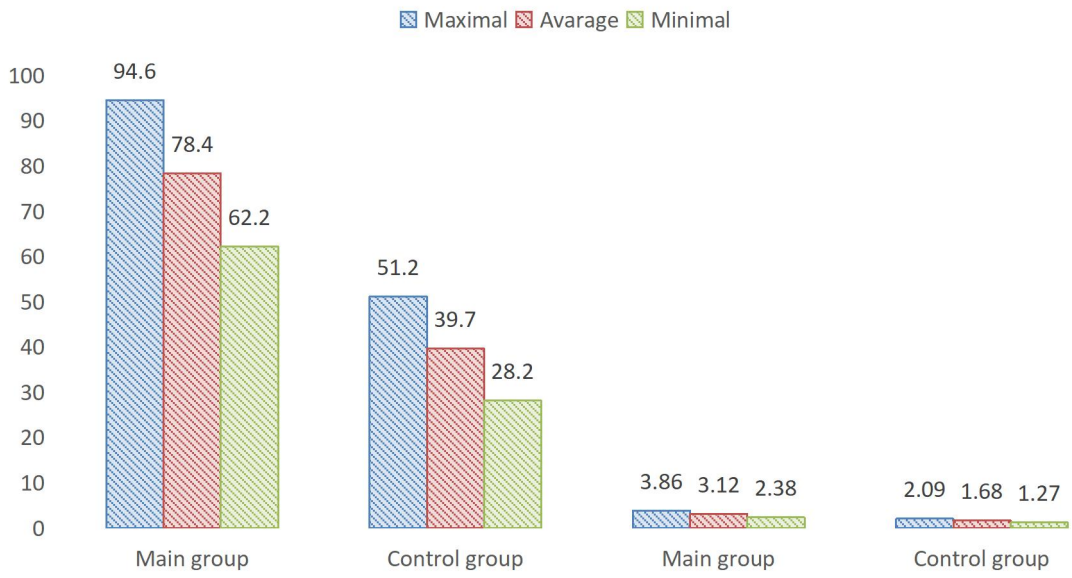


In the course of the study, it was found that in patients with MAFLD, the LAP (Lipid accumulation product) Index, which determines the early sign of atherosclerosis, averaged 78.4 ± 16.2 units for the main group, and 39.7 ± 11.5 units for the control group.

At the same time, 3.12 ± 0.74 pointers were identified in the IVO (Visceral obesity index) main group and 1.68 ± 0.41 in the control group. The IVO index shows a positive correlation with the complex intima media thickness of the trunk vessels ($r=0.52$; $p<0.05$).

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5. No 12. December ,2025

FIGURE 3. LAP AND IVO INDICES POINTERS



It can be seen from this that there is a reciprocal metabolic relationship between MAFLD, visceral obesity and atherosclerosis. The accumulation of fat in the liver and cases of visceral obesity lead to the early onset of atherosclerosis in patients.

During the study, a special procedure was introduced in order to reduce the incidence of MAFLD among patients, and to prevent atherosclerosis. These include stopping the consumption of sugar and refined carbohydrates, adding vegetables, proteins and fats that do not contain starch to the diet, performing daily Gymnastics, taking more potassium in the diet, reducing stressors, following a sleep routine.

Evaluation of the effectiveness of non-drug therapy:

- the physical rehabilitation program that developed by us, includes physical exercises, load-bearing walking exercises, exercise training and physiotherapy to perform the procedures for patients;
- adaptation of diet therapy according to the body weight index, respectively;
- anthropometric, hemodynamic, biochemical indicators were determined, which were carried out initially and between 1 and 3 months during the treatment;

Treatment measures were carried out in the following order:

Reducing body weight (performing diet and physical loads).

Reduction of triglycerin and hyperlipidemia (using statins).

Hepatoprotectors (Ursodeoxycholic acid (UDCA)) using a dose of 12-15 mg/kg body weight.

Conclusion. During the study, it was found that there is a relationship between the body's bioimpedance indicators and cardiometabolic factors between visceral obesity and liver fibrosis. Even in patients with normal body weight, liver steatosis and VO indices (IVO, HSI, LAP, NFS, FIB-4) are potential markers for early screening of MAFLD and visceral obesity. Liver fat accumulation, visceral obesity, and lipid imbalance should be considered as key factors in the early signs of atherosclerosis. It is considered important that the analysis of abdominal and waist circumference indicators is monitored in conjunction with the balance of body weight and height of patients. In the control system of Preventive Medicine, it is recommended to establish a screening of MAFLD and atherosclerosis.

AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES
ISSN NUMBER: 2692 - 5206 Volume 5. No 12. December ,2025

The results of our study found that nonmedicamentous therapy on MAFLD and VO indicators is effective in combination with statin and UDCA.
The established correlation allows for widespread use in clinical practice as a simple, easy-to-perform, and inexpensive way to detect atherosclerosis earlier.