

Markers of oxidative and atherogenic processes in individuals with hand-arm vibration syndrome and metabolic disorders

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Hand-arm vibration syndrome (HAVS) occupies one of the leading positions in the structure of occupational morbidity.

Diabetes mellitus (DM) is one of the most common noncommunicable diseases.

Changes in the activity of lipid peroxidation processes are observed when exposed to vibration, as well as metabolic syndrome (MS) and type 2 diabetes.

Lipoproteins and their oxidized forms play an important role in atherogenic processes and in the development of vascular pathology.

This study is devoted to the assessment of oxidative and atherogenic processes in individuals with HAVS in combination with metabolic disorders.

Materials and methods

Persons with HAVS
N=167,
age – 40-66 years

Group I
patients with HAVS, N=59

Group II
patients with HAVS and MS, N=73

Group III
patients with HAVS and DM type 2, N=35

We examined:

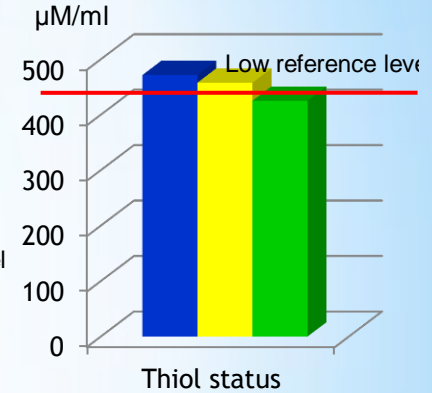
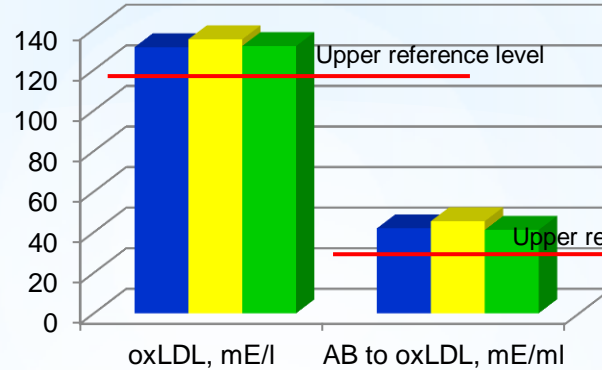
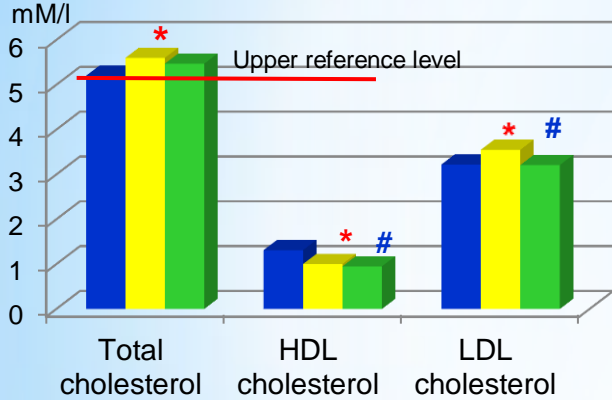
- total cholesterol
- cholesterol in high density lipoproteins (HDL cholesterol)
- cholesterol in low density lipoproteins (LDL cholesterol)
- oxidized low density lipoproteins (oxLDL)
- antibodies to oxidized low density lipoproteins (AB to oxLDL)
- thiol status (TS)

Statistic methods

nonparametric tests: Kruskal-Wallis, Mann-Whitney, Spearman rank correlation.

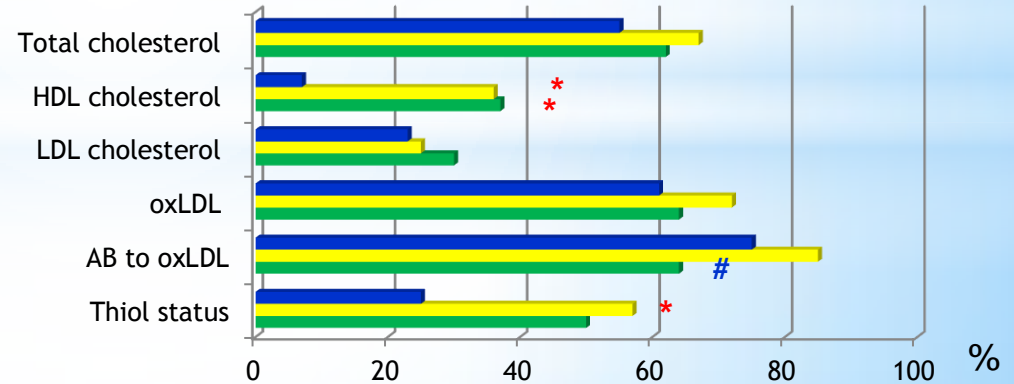
Results

Parameters of lipid and thiol status in individuals with HAVS and metabolic disorders, Me(25Q-75Q)



■ Group I ■ Group II ■ Group III

Frequency of deviation of indicators from the reference level, %



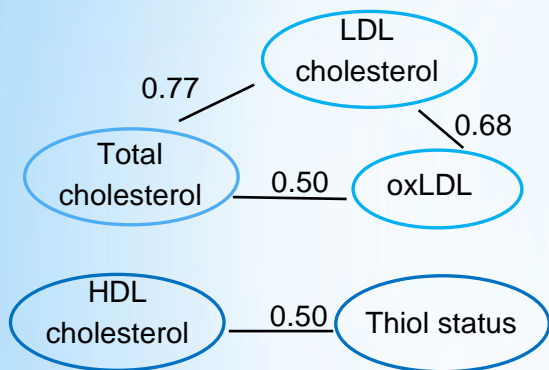
Notes:

* - differences are statistically significant compared with group I,

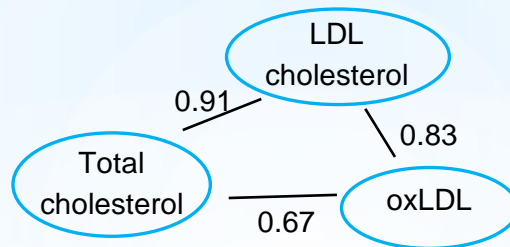
- tendency to differences compared with group II

The correlation relationships

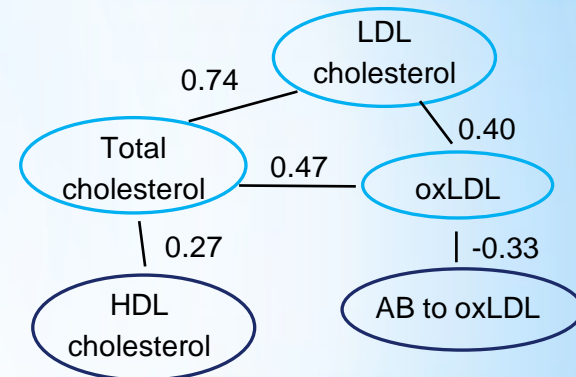
Group I



Group II



Group III



Conclusion

Thus, the levels of total cholesterol, oxLDL, and antibodies to oxLDL are increased in individuals with hand-arm vibration syndrome both with and without metabolic disorders. HDL cholesterol is reduced in patients with hand-arm vibration syndrome and metabolic disorders. An increase in blood levels of antibodies to oxLDL probably has a protective effect, exerting a regulatory effect on the level of oxLDL and inhibiting the process of atherogenesis. In patients with vibrational pathology and diabetes, lipid metabolism disorders are accompanied by a decrease in antioxidant protection, as evidenced by a reduced thiol status.