

Alteration of skin endothelium-dependent vasodilatation and relationship between insulin resistance and myeloperoxidase levels in metabolic syndrome patients

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Background

There are various pathophysiological mechanisms of endothelial dysfunction, oxidative stress, and insulin resistance in metabolic disorders. The aim of this study was to evaluate alterations in skin endothelium-dependent vasodilatation and myeloperoxidase (MPO) levels and their relation to insulin resistance in metabolic syndrome patients (MetS) with and without type 2 diabetes mellitus (DM).

Methods

MetS patients were classified into two groups: 20 patients with DM (D) and 20 patients without DM (W). 20 healthy subjects were selected as controls (C). The groups were matched for age and sex. Insulin resistance was measured by HOMA-IR method. Serum MPO was determined by xMAP technology (Luminex-200 analyzer). Laser Doppler imaging (LDI, Moor Instruments Ltd.), in conjunction with iontophoretic application of 1% acetylcholine (LDI-Ach) solution, was used to evaluate endothelium-dependent vasodilatation in the skin of the hand.

Results

Both patient groups demonstrated significantly higher serum MPO concentrations and HOMA-IR values than healthy control subjects ($p < 0.05$), however, this elevation was more pronounced in the D group ($p < 0.05$). Decreased results of the LDI-Ach test were only observed ($p < 0.05$) in the D group. MPO concentrations were correlated with HOMA-IR ($p < 0.05$), but not with LDI-Ach.

Conclusion

Our findings show that MetS patients have elevated insulin resistance and MPO; however, DM is associated with higher HOMA-IR values and MPO levels. There are close relationships between MPO and HOMA-IR.

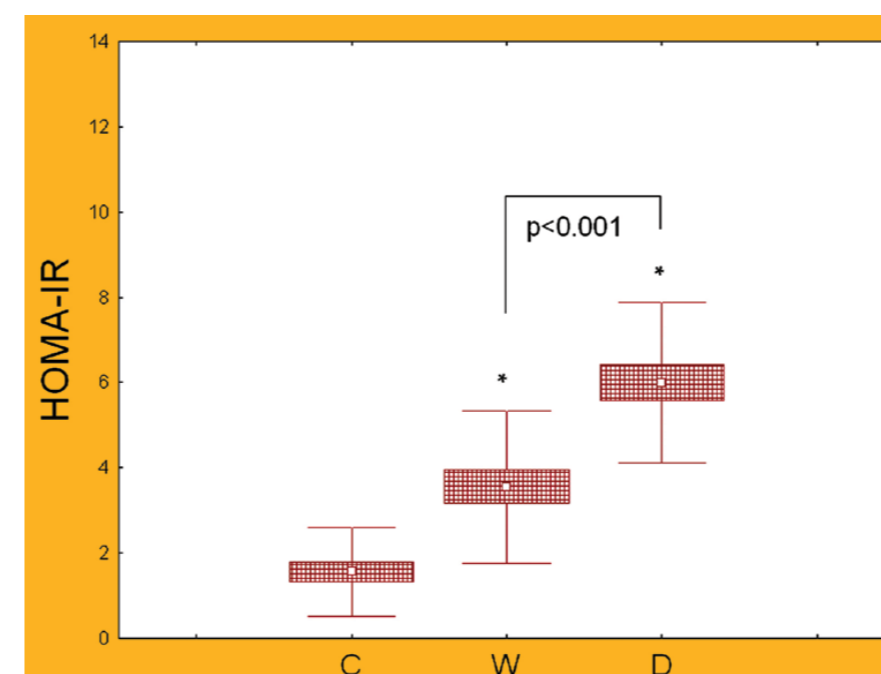


Figure 1. Insulin resistance (HOMA-IR) in healthy subjects (C), metabolic syndrome patients with (D) and without type-2 diabetes mellitus (W)

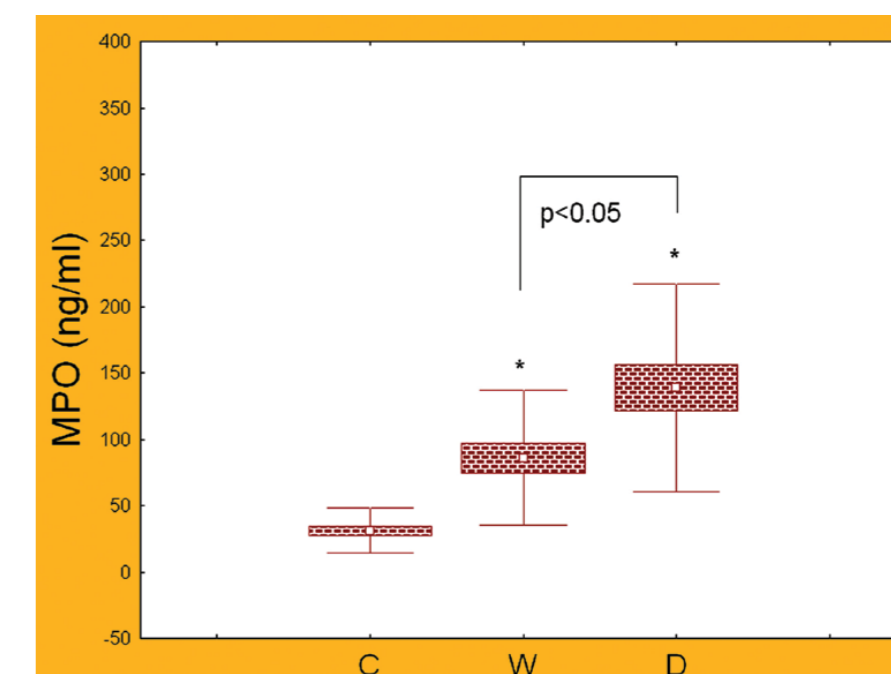


Figure 2. Myeloperoxidase (MPO) in healthy subjects (C), metabolic syndrome patients with (D) and without type-2 diabetes mellitus (W)

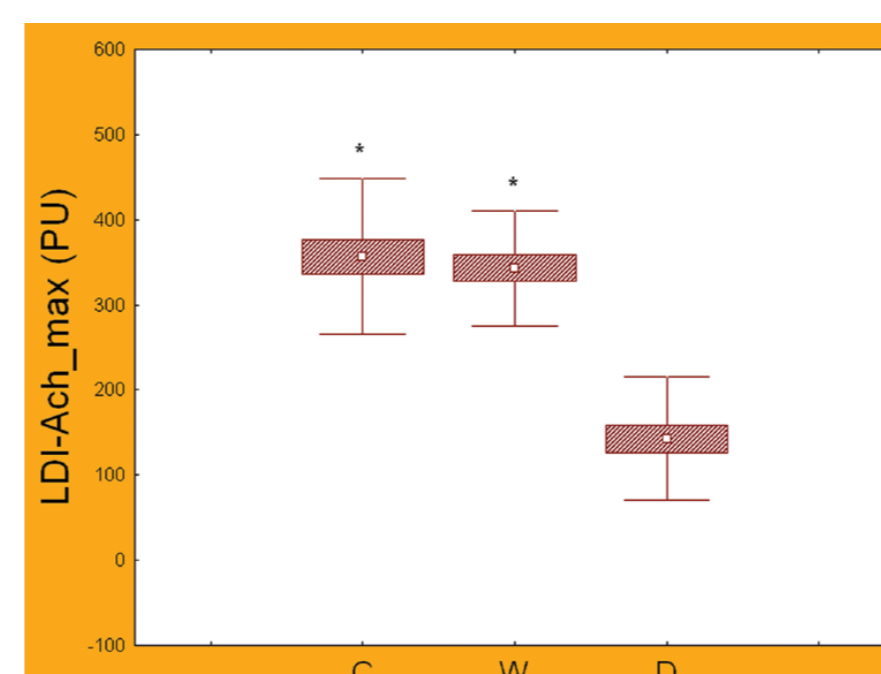


Figure 3. Acetylcholine induced endothelium-dependent vasodilatation in the skin of the hand in healthy subjects (C), metabolic syndrome patients with (D) and without type-2 diabetes mellitus (W)

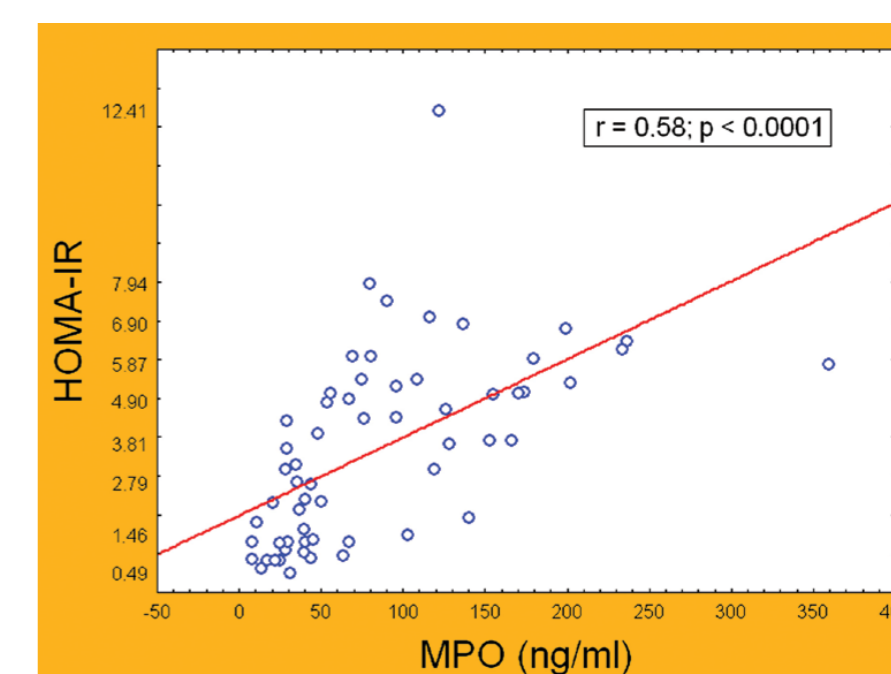


Figure 4. Correlation of myeloperoxidase (MPO) and insulin resistance (HOMA-IR) in total clinical material

Acknowledgements

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