

Inflammatory status in patients with metabolic syndrome

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We read the article 'The influence of chosen adipocytokines on blood pressure values in patients with metabolic syndrome' written by Musialik et al. with interest [1].

The authors aimed to investigate the impact of chosen adipocytokines, such as adiponectin, tumour necrosis factor alpha (TNF- α) receptors (sTNFR1, sTNFR2), and resistin, on the development of high blood pressure (BP), which is a significant risk factor for cardiovascular events. They concluded that the concentration of adiponectin was markedly lower in patients with metabolic syndrome (MetS) compared to the control group. In patients with MetS, sTNFR1 and sTNFR2 concentrations were significantly elevated and resistin level was significantly higher compared to control subjects. Negative correlations between adiponectin and the values of systolic (SBP) and diastolic (DBP) blood pressure were observed. Positive correlations between sTNFR2 and SBP and DBP values were found. Resistin levels correlated positively with SBP and DBP values. In a multiple regression model, the association of SBP with resistin level was observed in 32% of studied patients. They suggested that patients with MetS are diagnosed by the following disturbances: hypo-adiponectinaemia, elevated concentrations of soluble receptors for TNF- α , and hyperresistinaemia. Increased concentration of resistin may play a role in the development of high blood pressure.

Metabolic syndrome is a clinical entity comprising risk factors such as hypertension, glucose intolerance, atherogenic lipid profile, abdominal obesity, lack of physical activity, and increased inflammatory state. According to data from a previous study, MetS is described in more than 20% of men and 17% of women [2]. Most recent studies have demonstrated a correlation between inflammatory mediators and components of MetS. Particularly, interleukin 6 (IL-6), TNF- α , and C-reactive protein (CRP) levels have been observed to increase in MetS [3]. Another study has reported the association between the inflammatory markers and the severity of MetS [4]. These parameters indicating inflammation in MetS may be early markers of developing cardiovascular events.

Although the authors have shown that patients with MetS had significantly higher inflammatory mediators compared to those without MetS, they did not mention inflammatory mediators' status according to severity of MetS in the present study. Elevated inflammatory mediators is a common indicator of atherosclerotic involvement of the vascular structure indicating coronary artery disease, cerebrovascular disease, peripheral arterial disease and chronic inflammatory disease [5]. It can also be affected by the atherosclerotic risk factors such as smoking, alcohol consumption, hypercholesterolaemia, and hypothyroidism. The authors did not discuss in this study some of the factors affecting these markers, including smoking, alcohol consumption, insulin resistance, hypercholesterolaemia, hypothyroidism, heart failure, cerebrovascular disease, peripheral arterial disease and chronic inflammatory disease. It would be better if the authors had given information about these factors. In addition, the authors did not define clearly that MetS is independently associated with inflammatory parameters. It would be better if the authors had made a multivariate regression analysis, and adjusted for other related factors (e.g. smoking, hypercholesterolaemia, medications, and chronic inflammatory disease).

Secondly, some medications such as antihypertensive treatment (including angiotensin-converting enzyme inhibitors, angiotensin receptor blocker, β -blocker), statins, medications for weight loss, and a medical history of drug addiction may influence inflammatory mediators. It would be useful, and results might be different, if the authors had described these factors.

Furthermore, the presence of MetS may be associated with many factors, including socioeconomic and lifestyle factors. Individuals with a low level of education and of low socioeconomic status have been shown to be at a higher risk of MetS. They are usually characterised by incorrect dietary habits, low levels of physical activity and high levels of harmful habits, all of which increase the risk of metabolic abnormalities [6]. If these factors had been mentioned in the present study, its results would have been more robust.

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Lastly, these markers are described to assess inflammatory status and this can be affected by many factors. So, these markers themselves without other inflammatory markers may not provide information to clinicians about MetS.

For this reason, we think that it should be evaluated together with other serum inflammatory markers in routine clinical practice. We believe that these findings will act as a guide for further studies that will assess inflammatory status as a surrogate marker of endothelial dysfunction and its relationship with MetS.

Conflict of interests: none declared

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Author's response

I am very grateful to Balta et al. for their interest and comments on my article 'The influence of chosen adipocytokines on blood pressure values in patients with metabolic syndrome' [1]. I totally agree with the authors' suggestions and advice concerning my paperwork.

Metabolic syndrome is an exceptionally complex disease. In MetS, elevated levels of IL-6, TNF- α , and CRP can be observed. These parameters indicating that subclinical inflammation is present in MetS may be regarded as the early marker of developing cardiovascular events. Patients with MetS have significantly higher inflammatory mediators compared to those without MetS.

Elevated inflammatory mediators might be dependent on multiple factors, including smoking, alcohol consumption, insulin resistance, hypercholesterolaemia, hypothyroidism, heart failure, cerebrovascular disease, peripheral arterial disease and chronic inflammatory disease [2]. However, in the investigated population, none of the subjects was a smoker or abused alcohol. Some exclusion criteria were also established, such as: thyroid gland disease — both hypothyroidism and hyperthyroidism; an acute coronary or cerebrovascular event during the six months prior to the study; peripheral arterial disease; and any kind of chronic inflammatory process connected for example with rheumatic diseases. In this way, I was trying to restrict factors affecting inflammatory mediators. In future studies, it would be good to perform multivariate regression analysis, adjusted for other related factors. This is a very valuable suggestion.

At the same time, the influence of some pharmacological substances on inflammatory mediators was also taken into consideration. Angiotensin-converting enzyme inhibitors, an-

giotensin receptor blocker and β -blocker were withdrawn from the antihypertensive therapy 3–4 days before taking the blood samples, and statins five days before beginning the study. The results of this study would be stronger if incorrect dietary habits, low physical activity and low socioeconomic status were to be taken into consideration [3].

We still have to remember that inflammatory markers themselves, without any other clinical signs, couldn't be used as the only source of information about MetS. In routine practice, products of adipose tissue should always be compared and accompanied by other widely used factors such as lipid levels or glycaemia. I hope that this subject will be carried on in the future studies.

Conflict of interests: none declared

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