Editorial

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Is Pentraxin 3 A Marker in Pathogenesis of Metabolic Syndrome?

Carmine Finelli[1,2]*

[1]*Department of Internal Medicine, Ospedale Cav. R. Apicella – ASL Napoli 3 Sud, Via di Massa, 1, 80040 Pollena (Napoli), Italy*

[2]*Covid Hospital Boscotrecase - ASL Napoli 3 Sud, Via Lenza, 3, 80042 Boscotrecase (Napoli), Italy*

***Corresponding author:** Carmine Finelli, Department of Internal Medicine, Ospedale Cav. R. Apicella – ASL Napoli 3 Sud, Via di Massa, 1, 80040 Pollena (Napoli), Italy

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ABSTRACT

Abbreviations: PTX3: Pentraxin 3; CRP: C-Reactive Protein; MetS: Metabolic Syndrome; HIIE: High-Intensity Interval Exercise; T2D: Type 2 Diabetes; NAFLD: Nonalcoholic Fatty Liver Disease

Editorial

Pentraxin 3 (PTX3) is an acute-phase protein that is structurally similar to C-reactive protein (CRP). Macrophages, endothelial cells, and adipocytes all produce PTX3 in response to inflammatory stimuli, but hepatocytes are the main source of CRP. PTX3 could play a role in the genesis of obesity, metabolic syndrome (MetS), and CRP because obesity and MetS are chronic inflammatory diseases [1]. MetS is a group of risk factors that includes glucose intolerance, abnormal lipid profiles, hypertension, and abdominal obesity [2-6]. Each of these factors has been linked to atherosclerosis and cardiovascular disease. The majority of current research has found a link between MetS components and inflammatory mediators such as interleukin-6, tumor necrosis factor-α, and CRP [7]. Furthermore, serum CRP levels were shown to be greater in individuals with more risk factors for MetS, and higher serum CRP levels were related to higher occurrence of cardiovascular events, reflecting the prognostic relevance of MetS severity [8]. In particular, many types of cells, including macrophages, dendritic cells, neutrophils, adipose cells, fibroblasts, and vascular endothelial cells, have been reported to produce PTX-3, a newly recognized acute-phase reactant that is structurally and functionally similar to CRP [9]. The link between MetS and PTX-3 hasn't been well investigated, and the available evidence appears to be discordant. Several investigations have found a link between MetS components and inflammatory mediators such as interleukin-6, tumor necrosis factor-α, and CRP [7]. The hs-CRP is the most well-known and validated of these inflammatory biomarkers. Insulin resistance, endothelial dysfunction, and unfavorable cardiovascular events have all been linked to high levels of hs-CRP [10,11].

The level of plasma PTX3 was found to be inversely related to metabolic syndrome, overweight/obesity, and dyslipidemia-related parameters, implying that PTX3 may have a cardioprotective role in atherosclerosis [12]. Obese people have dysregulated circulating PTX3 levels, which are raised after acute aerobic activity. In patients with CVD, high-intensity interval exercise (HIIE) has been shown to be equally beneficial as continuous moderate-intensity exercise in increasing endothelial function, as measured by BAFMD (brachial artery flow-mediated dilation) [13]. In obese people, HIIE could be used as a time-saving exercise prescription technique to enhance endothelial function in the short term, even if plasma PTX3 levels are elevated [13]. Another, the presence of elevated PTX-3 levels

in the blood is linked to intermediate to severe obstructive sleep apnea syndrome [14]. For sleep apnea syndrome research, the PTX-3 biomarker appears to be a promising option [14]. Because high-quality technical diagnostic and treatment equipment, as well as highly-educated and experienced staff, sleep apnea syndrome is associated with considerable cardio-, cerebrovascular, metabolic, and hormonal comorbidities, it is one of the more expensive medical specialty [14].

Patients with type 2 diabetes (T2D) are more likely to develop nonalcoholic fatty liver disease (NAFLD). PTX3 is an inflammatory marker and a cardiovascular risk factor, as said. In patients with T2D, PTX3 is linked to TC, TG, LDL-C, apo B, and apo C3. Only in NAFLD patients do associations with LDL-C and apolipoproteins persist. The findings of our study could help us better understand the factors that influence PTX3 in T2D patients and, as a result, provide more tailored treatment [15]. PTX3 seems to be an unique therapy target for GLP-1RAs, a pharmacological family that has the potential to bridge the gap between T2D and NAFLD while also preventing cardiovascular disease (on a primary or secondary basis). In addition to explicate this logical and intriguing theory, prospective human trials using GLP-1RAs in patients with T2D and NAFLD, examining their influence on PTX3, are needed [16]. This could be a key component of tailored treatment for individuals with T2D, NAFLD, or cardiovascular disease who want to improve their prognosis. PTX3 could be a useful biomarker and therapy target for GLP-1RAs in this scenario [17]. The presence of PTX-3 was linked to the severity of MetS, as well as other inflammatory markers and cardiovascular testing [18]. Pentraxin 3 could be a precursor to cardiovascular disease in children who are overweight too [19]. Therefore, the level of PTX3 in a child's blood can be used to measure cardiovascular risk, allowing for early intervention and prevention of future cardiovascular disorders [20]. Future longitudinal studies are needed to evaluate the predictive value of pentraxin 3 for MetS. However, the mechanisms and therapeutic potential of PTX3 in MetS remained to be investigated.

Disclosure Statement

The author declare that there are no conflicts of interest.

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