LETTER TO THE EDITOR

Leptin-Adiponectin Ratio: A Promising Index for Metabolic Syndrome

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Dear Editor,

Non-communicable diseases (NCDs) are the number one cause of disability and pose devastating health consequences. The frequency of metabolic syndrome (MetS) in early life has increased due to a rise in obesity rates among young people [1]. The prevalence of MetS ranges from 15% and 40% globally and is more prevalent in developing countries [2]. MetS is also very prevalent in Pakistan. According to a recently released study conducted in Pakistan, the prevalence of MetS is 55.4% when using NCEP-ATP III criteria and 54.9% when using IDF criteria [3]. In obesity, there is excessive accumulation of adipose tissue. Some pro-inflammatory cytokines released from adipose tissue are involved in the pathogenesis of MetS. This pathway is intricate and research indicates that the MetS is an inflammatory condition where adipokines (leptin and adiponectin) have a major impact [4]. In a study conducted in Pakistan, leptin to adiponectin ratio was found to be higher in obese individuals [5].

Obesity is defined by excessive adipose tissue deposits that can negatively impact health. Cytokines regulate growth and activity of immune system cells. Leptin and adiponectin are secreted by adipose tissue and help regulate glucose homeostasis, insulin sensitivity, lipid metabolism [6]. In obesity, enlarged adipocytes produce higher levels of leptin but lower levels of adiponectin. The elevated leptin, often coupled with leptin resistance, triggers oxidative stress in endothelial cells, promotes the release of pro-inflammatory cytokines, and shifts glucose metabolism toward fatty acid oxidation. [7]. Adiponectin possesses insulin-sensitizing and anti-inflammatory properties; however, reduced levels of adiponectin in obesity may diminish these protective effects associated with the hormone [8].

Leptin and adiponectin exert opposing effects on subclinical inflammation. Leptin increases the production of cytokines like TNF-α and IL-6, which are linked to insulin resistance in type 2 diabetes and are therefore regarded as pro-inflammatory cytokines. In contrast, adiponectin decreases the expression and release of various pro-inflammatory immune mediators and exhibits anti-inflammatory effects [9]. An adiponectin/leptin ratio of ≥1.0 is considered normal, while a ratio between ≥0.5 and <1.0 suggests a moderate to medium increased risk. A ratio of <0.5 indicates a significant increase in cardiometabolic risk [10]. Further large-scale epidemiological studies are necessary to confirm these proposed cutoffs in population.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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