

Adiponectin and Metabolic Syndrome Prevention

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In recent years, adiponectin (APN), a novel adipocytokine, has attracted the scientists attention. Low circulatory concentration of this protein is observed in obese patients and patients with type 2 diabetes and metabolic syndrome (1). Moreover, through its antiatherogenic and anti-inflammatory effects, APN plays a protective role against the development of metabolic disorders (2). Metabolic syndrome (MetS) is a collection of obesity-associated disorders and is very common in different populations (3). Its prevalence in Iran is reported at 34.7% to 41.6% depending on the different diagnostic criteria in rural and urban area (4). Higher prevalence has also been reported in the particular populations; for example, in people older than 60 years old in west of Iran the prevalence was reported at 44.7% (5). An important issue in this field is association of hypoadiponectinemia with MetS (6, 7). Research in this aspect indicated that hypoadiponectinemia is associated with MetS and its association is stronger than any other inflammatory markers (6). We previously reported low concentration of APN in postmenopausal women with type 2 diabetes (8). In addition, we showed that serum APN level is inversely correlated with insulin resistance in obese men with type 2 diabetes (9). APN directly activate AMP-activated protein kinase (AMPK), induces peroxisome proliferator-activated receptor alpha (PPAR- α) transcription (10), and subsequently has an important positive effect on lipid metabolism regulation. On the other hand, antioxidative effect of APN (2) makes it a beneficial agent in oxidative stress-related disorders.

The scientists have focused on finding different ways to increase plasma level of APN and therefore, diminishing MetS complications. A recently published review discussed the effect of different intervention on APN and APN receptors (11). In addition to pharmacologic agents, exercise, weight loss, caloric restriction and changing life

style, and consumption of some foods are other ways of improving APN level (11). Fish oil, catechin, and green tea extract are compounds can augment APN level in animal models (11). Other than changing the life style and increasing the physical activity, the researchers are interested in using plant products or herbals that increase APN level. An interesting study is a clinical trial conducted by Gomez-Arbelaez et al. on patients with MetS (12). Results of this study indicated that using of aged garlic extract improves APN levels in those with MetS (12). Although garlic is commonly used in different countries, its pungent odor makes it unfavorable for most people. Aged garlic extract that is used in the mentioned study was odorless and rich in antioxidant, and has been shown to contain antioxidant and antithrombotic properties. Nevertheless, there is a report showing no effect of garlic on APN concentration in women with MetS (13). Another natural product that is shown to induce APN secretion is resveratrol (14). It is shown that long-term daily consumption of resveratrol containing grape can increase serum APN (15). We recently examined the effect of resveratrol on the other adipocytokines, namely, apelin, visfatin, and vaspin, resistin gene expression on diabetic rats (unpublished observation). Our preliminary results indicated that resveratrol reduces resistin gene expression. Considering the high prevalence MetS particularly in middle-age subjects, implantation of proper policies to prevent this disorder is necessary. Since using herbal medicine is very popular nowadays, it can be a good field of investigation to find the natural products that can increase APN level and subsequently prevent MetS. The other issue is finding the exact mechanisms of their action.

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