



## Utility of the Visceral Adiposity Index and Hypertriglyceridemic Waist Phenotype for Predicting Incident Hypertension (*Endocrinol Metab* 2017;32:221-9, Mohsen Janghorbani et al.)

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Visceral obesity is the most prevalent manifestation of metabolic syndrome and is a marker of dysfunctional adipose tissue and ectopic fat infiltration [1,2]. The initiation of derangement of metabolic health strongly correlates with insulin resistance and systemic inflammation derived from inflamed visceral adipose tissue [3]. Not just having a large amount of fat in body, but also the depot-specific accumulation, is important for the development of metabolic consequences, because accumulation of fat in the visceral depot, not in the subcutaneous depot, has negative effects on the metabolic health of the body.

Many indices are now available to assess visceral obesity and the subsequent metabolic complications. The visceral adiposity index (VAI) is a sex-specific mathematical scoring system that was developed using simple, classical anthropometric and metabolic parameters, such as waist circumference (WC), body mass index, triglyceride (TG) levels, and high-density lipoprotein cholesterol, to identify insulin resistance and cardiometabolic risk [4]. In previous studies, VAI has been found to be independently associated with visceral adiposity assessed by abdominal computed tomography [4,5]. Recent studies have reported an association between high VAI and insulin resistance and subclinical atherosclerosis [6,7]. Another conceptually simple phe-

notype that could reflect one's cardiometabolic risk is the hypertriglyceridemic waist (HTGW) phenotype, which is simply defined by high TG and a large WC [8]. Recent studies have suggested that individuals with the HTGW phenotype have a high risk for subclinical atherosclerosis and are also at risk for the development of diabetes [9,10].

In the study by Janghorbani et al. [11], the authors reported an association of high VAI and the HTGW phenotype with incident hypertension (HTN) in a 7-year follow-up study of 1,375 first-degree non-diabetic and non-hypertensive relatives of patients with type 2 diabetes. The authors found that compared with those in the lowest VAI quintile at baseline, those in the highest baseline VAI quintile showed a 1.7-fold increased risk of incident HTN. Furthermore, those with the HTGW phenotype showed a 2.3-fold increased risk of incident HTN compared to those with a normal TG level and normal WC. This is a very interesting study in a well-characterized study population at high risk for diabetes development. The study was elegantly designed and well-performed, using appropriate analytic methods.

I have some suggestions and comments about this study. The first question is whether the authors considered the development of diabetes or other cardiovascular end-points in this study pop-

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ulation. Previous studies have reported a high risk of diabetes development in subjects with the HTGW phenotype and a high risk of coronary artery calcification in subjects with a high baseline VAI [9]. Therefore, I wonder if similar results would be observed in this study population. Second, I wonder if the authors thought of analyzing whether metabolically healthy obese (MHO) subjects were present in this study population [12]. The debate about the existence of MHO individuals in various ethnic populations continues [13]. It would be interesting if the authors analyzed the level of risk that MHO subjects had for developing diabetes or HTN, since this study population is at a high risk for diabetes. Lastly, I think the authors should interpret the results with caution, since this study population is already at a high risk for metabolic derangement and diabetes.

I want to congratulate the authors on this beautiful work and expect to see in the future many excellent studies emerging from this well-structured Iranian cohort.

## CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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