

## **Diabetes Mellitus and Inconsistency between Body Mass Index and Waist Circumference**

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## **Abstract**

**Background:** Body mass index (BMI) and waist circumference (WC) are criteria for obesity and metabolic syndrome, respectively. Both BMI and WC are easily accessible and crucial quotients for predicting chronic diseases and mortality. Although most people exhibit a strong association between BMI and WC, cumulative evidence suggested that inconsistency between them, such as subjects with normal weight ( $BMI < 25\text{kg/m}^2$ ) and high WC (termed to central obesity), was related to the increased risk of chronic disease and mortality. Using data from a Korean-nationwide survey, this study aimed to identify prevalence of diabetes mellitus (DM) associated to inconsistency between BMI and WC.

**Methods:** The 2014 – 19 Korea National Health and Nutrition Examination Survey were used for this study. Through the relationship between BMI and WC using linear regression analysis, we obtained gender-specific estimated values of WC (eWC). We calculated the difference between WC and eWC ( $\text{delta WC} = \text{eWC} - \text{WC}$ ). We separately categorized Korean men and women into three group based on the tertile of delta WC, which were high WC ( $\text{WC} > \text{eWC}$ ), standard ( $\text{WC} \cong \text{eWC}$ ), and low WC ( $\text{WC} < \text{eWC}$ ) groups. Logistic regression (LR) was implemented to identify DM related to the delta WC.

**Results:** As the delta WC increased, the prevalence of DM showed linear increase in Korean men and exponential increase in Korean women. Using the multivariate LR with setting the standard group as reference, high WC group was related to high presence of DM and low WC was associated with low presence of DM in both Korean men and women.

**Conclusion:** We identified the prevalence of DM was related to the inconsistency between BMI and WC.

**Keywords:** body mass index; waist circumference; diabetes mellitus