Association of anthropometric measures with diabetes in Mashhad population applying logistic regression model

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Abstract

Introduction: Diabetes is one of the chronic diseases with no curative treatment; also, it is the most common cause of amputation, blindness and chronic renal failure and the most important risk factor of heart diseases. Logistic regression is one of the statistical analysis models for predicting that can be used to find out the relationship between dependent and predictor independent variables and control of the confounding variables. The aim of this study was to estimate the association of diabetes with body mass index (BMI), waist to hip ratio (WHR), and waist circumference (WC) in the population of Mashhad aged 35 to 64 years.

Methods: We used data from cross sectional study Mashhad Study with a sample size of 9536 aged 35 to 64 living in Mashhad. All subjects underwent clinical examination including anthropometric measurements logistic regression can be used to predict whether a patient has a given disease (Diabetes considered as the response variable), based on observed characteristics (body mass index (BMI), waist-to-hip ratio (WHR), age , gender, waist circumference (WC), were considered as independent variables in the model. General and abdominal obesity were defined by using WHO criteria. All statistical analysis was performed by using software SPSS (version 16) and the significance level was set to 0.05 as usual.

Results: In this article, of the total sample size 41.6% was men and 58.4% was women. Mean and standard deviation of age were 45.04 and 8.96 respectively. In logistic regression analysis the odds ratio (OR) of having diabetes in subjects with general obesity (based on BMI) and abdominal obesity (based on WC and WHR) after adjustment for age was 1.74(1.33-2.29), 1.57(1.22-2.03) and 1.89(1.47-2.43) respectively in men, also 1.64(1.38-1.94), 1.90(1.52-1.61) and 2.00(1.52-2.61) respectively in women, $p<0.001$). After adjustment for other anthropometrical indices, WHR was an independent predictor of diabetes in both sexes (OR of 1.25 and 1.60 in men and women respectively, $p<0.001$) while with this critical BMI in women and WC in men lost their association with diabetes.

Conclusion: The logistic regression model was an appropriate model for the prediction of diabetes in this study. WHR is a suitable predictor of diabetes independent of BMI and WC in both sexes. In comparison to WHR, BMI in women and WC in men are not suitable indices for prediction of diabetes risk in Mashhad urban population. These findings could be used in local preventive and health policy plans.

Key words: Logistic Regression, Diabetes, Obesity, Odds Ratio