

CORRESPONDENCE

Waist circumference compared with other obesity parameters as determinants of coronary artery disease in essential hypertension: statistical issues to avoid misinterpretation

Hypertension Research (2017) 40, 516; doi:10.1038/hr.2016.168; published online 1 December 2016

We were interested to read the paper by Dimitriadis *et al.*¹ that was published in *Hypertension Research* in June 2016. The authors aimed to evaluate the predictability power of body mass index (BMI), waist circumference (WC) and waist-to-hip ratio (WHR) for the incidence of coronary artery disease (CAD) in a cohort of essential hypertensive patients. The result of the Cox proportional hazard model showed that, among the studied anthropometric indices, WC can only be a predictor of the future development of CAD.¹

Although the data were interesting, some methodological and statistical issues should be considered. It is unclear how the predictors of the final Cox regression model are determined in the study. In addition, it seems that some clinically sensible interactions among the variables were missed in the study. Investigators typically use the step-wise methods for model building. First, bivariate correlations among variables are assessed to test potential multicollinearity. Second, they conducted the regression model with backward step-wise selection for those variables that were found to be associated with the studied outcome on univariate analysis (P -value < 0.2), as well as for clinically sensible interaction terms.²

As the authors note in their conclusion, WC can only predict the future development of CAD; such a conclusion is an optimistic

interpretation unless the prediction model can be validated internally or externally.³

Moreover, we suggest that the authors can reanalyze their data to evaluate the power of each of the studied predictors to discriminate which subjects will develop CAD using the C-statistics or area under the Receiver Operating Characteristics (ROC) curve (AUC) and then to examine the statistical difference between the AUCs using statistical methods such as Hanley and McNeil or DeLong.^{4,5}

The concluding message for the readers is that, for modern clinical prediction, several powerful and valuable tools are available for model building and risk prediction.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

The authors thank statistics consultants at the Research Development Center of Sina Hospital for their technical assistance.

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