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Letter

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Letter: Cut-off Values and Clinical Utility of Surrogate Markers for Insulin Resistance and Beta-Cell Function to Identify Metabolic Syndrome and Its Components among Southern Indian Adults (J Obes Metab Syndr 2020;29:281-91)

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Insulin resistance and visceral adiposity are common features of metabolic syndrome (MetS), although the pathophysiology of MetS is very complex.[1] The hyperinsulinemic-euglycemic clamp technique is the "gold standard" test for the evaluation of insulin resistance and insulin sensitivity, but this method is time-consuming and inconvenient, making it difficult to use in a clinical setting. Therefore, many surrogate markers have been developed that can be used to evaluate insulin resistance and insulin sensitivity, starting with the homeostatic model assessment of insulin resistance (HOMA-IR) and quantitative insulin sensitivity check index.[2] Endukuru et al.'s study[3] is very informative in that the authors evaluated almost all known surrogate markers of insulin resistance and insulin sensitivity in the same study subjects. As a result, the authors[3] presented a cut-off of several surrogate markers that can detect risk groups for MetS in Southern Indian adults. At the very least it is useful data for clinical application in the relevant region, although these results need to be confirmed with a larger number of study subjects in various regions.

However, if some additional analysis was performed as follows, readers will be able to better understand and apply these findings to clinical practice. The first thing I would like to mention is the comparison of diagnostic values. In this study, the terms "higher," "lower," or "best" were used when presenting the area under the curve (AUC) values among various surrogate markers using the receiver operating characteristic (ROC). However, as the authors mentioned in the statistical section of the research methods, comparing diagnostic values using ROC is not simply a comparison of AUC values, so such expressions are inappropriate without providing statistical values. In other words, as in the study of Lee et al.,[4] AUC comparisons should be performed using programs such as MedCalc (Ostend, Belgium) to determine the diagnostic value for MetS among surrogate markers and a *P*-value should be presented. Secondly, in this study, since controls were individually matched to cases by age and sex, the statistical analysis should be performed

differently for a 1:1 matched case-control design. That is, a paired t-test, Wilcoxon signed-rank test, or McNemar test should be used instead of the independent t-test, Mann-Whitney U-test, or chi-square test for comparisons between variables, and conditional logistic regression, not logistic regression analysis, should be used to calculate odds ratios. Another concern is the practical implications of surrogate marker cut-offs. It is difficult to argue that this surrogate marker is superior to other markers using simple numerical comparison because the cut-off values are slightly different for each study. As suggested by Wallace et al.[5] there may be pathophysiological differences in the factors used to measure beta-cell function. Lastly, in this study, a cut-off for each marker was proposed regardless of sex, but there are some differences between men and women in the cut-off in other studies.[6,7] For example, a northern Iranian cohort study of 5,511 participants suggested a cut-off of 2.0 in men and 2.5 in women as an optimal cut-off point for HOMA-IR in the diagnosis of MetS.[7] Addressing these aspects would strengthen the study's results and resolve remaining questions.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

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RERERENCES

1. Chopra AK. Metabolic syndrome or insulin resistance: evolution, controversies and association with cardiovascular disease risk. Indian J Clin Cardiol 2020;1:77-85.
2. Park SE, Park CY, Sweeney G. Biomarkers of insulin sensitivity and insulin resistance: past, present and future. Crit Rev Clin Lab Sci 2015;52:180-90.
3. Endukuru CK, Gaur GS, Yerrabelli D, Sahoo J, Vairappan B. Cut-off values and clinical utility of surrogate markers for insulin resistance and beta-cell function to identify metabolic syndrome and its components among southern indian adults. J Obes Metab Syndr 2020;29:281-91.
4. Lee JG, Lee S, Kim YJ, Jin HK, Cho BM, Kim YJ, et al. Multiple biomarkers and their relative contributions to identifying metabolic syndrome. Clin Chim Acta 2009;408:50-5.
5. Wallace TM, Levy JC, Matthews DR. Use and abuse of HOMA modeling. Diabetes Care 2004;27:1487-95.
6. Gayoso-Diz P, Otero-González A, Rodriguez-Alvarez MX, Gude F, García F, De Francisco A, et al. Insulin resistance (HOMA-IR) cut-off values and the metabolic syndrome in a general adult population: effect of gender and age: EPIRCE cross-sectional study. BMC Endocr Disord 2013;13:47.
7. Motamed N, Miresmail SJ, Rabiee B, Keyvani H, Farahani B, Maadi M, et al. Optimal cutoff points for HOMA-IR and QUICKI in the diagnosis of metabolic syndrome and non-alcoholic fatty liver disease: a population based study. J Diabetes Complications 2016;30:269-74.