Comparison of the Anthropometric Obesity Indices in Prediction of Cardiovascular Disease Risk: Systematic Review and Meta-analysis

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Abstract : Statement of the problem: The relationship between obesity and cardiovascular diseases has been studied widely(1). The distribution of fat tissue gained attention in relation to cardiovascular risk factors during lang-time research (2). American College of Cardiology/American Heart Association (ACC/AHA) is widely and the most reliable tool to be used as a cardiovascular risk (CVR) assessment tool(3). This study aimed to determine which anthropometric index is better in discrimination of high CVR patients from low risks using ACC/AHA score in addition to finding the best index as a CVR predictor among both genders in different races and countries. Methodology & theoretical orientation: The literature in PubMed, Scopus, Embase, Web of Science, and Google Scholar were searched by two independent investigators using the keywords "anthropometric indices," "cardiovascular risk," and "obesity." The search strategy was limited to studies published prior to Jan 2022 as full-texts in the English language. Studies using ACC/AHA risk assessment tool as CVR and those consisted at least 2 anthropometric indices (ancient ones and novel ones) are included. Study characteristics and data were extracted. The relative risks were pooled with the use of the random-effect model. Analysis was repeated in subgroups. Findings: Pooled relative risk for 7 studies with 16,348 participants were 1.56 (1.35-1.72) for BMI, 1.67(1.36-1.83) for WC [waist circumference], 1.72 (1.54-1.89) for WHR [waist-to-hip ratio], 1.60 (1.44-1.78) for WHtR [waist-to-height ratio], 1.61 (1.37-1.82) for ABSI [A body shape index] and 1.63 (1.32-1.89) for CI [Conicity index]. Considering gender, WC among females and WHR among men gained the highest RR. The heterogeneity of studies was moderate (α^2: 56%), which was not decreased by subgroup analysis. Some indices such as VAI and LAP were evaluated just in one study. Conclusion & significance: This meta-analysis showed WHR could predict CVR better in comparison to BMI or WHtR. Some new indices like CI and ABSI are less accurate than WHR and WC. Among women, WC seems to be a better choice to predict cardiovascular disease risk.

Keywords : obesity, cardiovascular disease, risk assessment, anthropometric indices

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