

Association between arterial stiffness and the clustering of metabolic syndrome risk factors: a systematic review and meta-analysis

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Abstract

OBJECTIVES: Metabolic syndrome (MetS) is a cluster of different cardiometabolic risk factors (CMRFs), and its different combinations with other CMRFs, such as arterial stiffness have been hypothesized to explain, at least partially, increased risk of cardiovascular disease. Thus, in this systematic review and meta-analysis, we aimed to synthesize the evidence regarding the association between the clustering of MetS-related CMRFs and arterial stiffness measured using pulse wave velocity (PWV).

METHODS: Original studies analysing the association between arterial stiffness, measured using PWV, and MetS were systematically searched. Pooled effect size estimates and their respective 95% confidence intervals (CI) were calculated using the DerSimonian and Laird method for two separate analyses: the diagnosis of MetS and PWV values and the number of CMRFs and PWV values. **RESULTS:** Moderate effect size estimates were observed between MetS and PWV (0.68, 95% CI: 0.54-0.82) with a slightly higher effect size for the low-risk compared with the high-risk population group (0.75, 95% CI: 0.58-0.92; and 0.51, 95% CI: 0.32-0.82, respectively). A trend between the number of MetS-related CMRFs and PWV was found with the pooled effect size nearly doubling as the number of MetS-related CMRFs increased, 0.11 (95% CI: 0.04-0.17) for one MetS-related CMRF, 0.26 (95% CI: 0.13-0.4) for two, and 0.4 (95% CI: 0.2-0.6) for three or more. **CONCLUSION:** These results demonstrated a clinically relevant association between MetS and PWV and an increasing trend in PWV values, such as a MetS-related CMRF increase. Although these results should be considered cautiously because of the considerable heterogeneity, our findings reinforce the rationale of MetS as an aggregation of risk factors with common causes, which could provide additional useful information to guide clinical management. Copyright © 2020 Wolters Kluwer Health, Inc. All rights reserved.