

Publication

Impact of sedentary behavior on large artery structure and function in children and adolescents: a systematic review

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Sedentary behavior contributes to increased atherosclerotic risk in adults. Whether or not this can be extended to pediatric populations is unclear. This systematic review assessed associations of sedentary behavior with large artery structure and function in pediatric populations. MEDLINE, EMBASE, CENTRAL, and Web of Science were searched from the earliest available date to 31st of December 2018. Analyses of associations of sedentary behavior with large artery structure or function in a pediatric (sub-)population were included, adhering to the PRISMA guidelines. The protocol was published in advance on PROSPERO (CRD42018112996). Study quality and quality of evidence were analyzed using NHLBI Study Quality assessment tools and GRADE. Six observational studies found no association of exposure and outcome variables, and one had contradicting results. One intervention found reduced flow-mediated dilation after 3 h of uninterrupted sitting. Exposure and outcome measures were highly heterogeneous. Study quality was low to moderate. Quality of evidence was very low or low in the observational studies and high in the intervention. Conclusion: In pediatric populations, current evidence is limited and of low quality about how acute effects of sedentary behavior translate into early vascular aging and the long-term development of vascular dysfunction and atherosclerotic risk. Future studies should emphasize a careful choice of the adequate type and measurement site of a biomarker for large artery structure and function as well as conduct a detailed assessment of sedentary behavior patterns. Trial registration: PROSPERO Registration Number: CRD42018112996 What is known: - An independent association of sedentary behavior and biomarkers of large artery structure and function has been demonstrated in adults. - In children, sedentary behavior is directly associated with classical cardiovascular risk factors like elevated blood glucose levels, insulin resistance, high blood pressure, obesity, and elevated blood lipids. What is new: - Currently, only few studies of low quality in children and adolescents provide limited evidence about how acute effects of sedentary behavior translate into early vascular aging and the long-term development of atherosclerosis. - The type and measurement site of vascular biomarker need to be chosen carefully, and a detailed assessment of sedentary behavior patterns is important to minimize the methodological bias.

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