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Review Rheumatol Int. 2020 Dec;40(12):1921-1939. doi: 10.1007/s00296-020-04691-5. Epub 2020 Aug 28.

Cardiovascular risk assessment in patients with rheumatoid arthritis using carotid ultrasound B-mode imaging

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Abstract

Rheumatoid arthritis (RA) is a systemic chronic inflammatory disease that affects synovial joints and has various extra-articular manifestations, including atherosclerotic cardiovascular disease (CVD). Patients with RA experience a higher risk of CVD, leading to increased morbidity and mortality. Inflammation is a common phenomenon in RA and CVD. The pathophysiological association between these diseases is still not clear, and, thus, the risk assessment and detection of CVD in such patients is of clinical importance. Recently, artificial intelligence (AI) has gained prominence in advancing healthcare and, therefore, may further help to investigate the RA-CVD association. There are three aims of this review: (1) to summarize the three pathophysiological pathways that link RA to CVD; (2) to identify several traditional and carotid ultrasound image-based CVD risk calculators useful for RA patients, and (3) to understand the role of artificial intelligence in CVD risk assessment in RA patients. Our search strategy involves extensively searches in PubMed and Web of Science databases using search terms associated with CVD risk assessment in RA patients. A total of 120 peer-reviewed articles were screened for this review. We conclude that (a) two of the three pathways directly affect the atherosclerotic process, leading to heart injury, (b) carotid ultrasound image-based calculators have shown superior performance compared with conventional calculators, and (c) AI-based technologies in CVD risk assessment in RA patients are aggressively being adapted for routine practice of RA patients.

Keywords: Arthritis; Atherosclerosis; Cardiovascular disease; Carotid artery diseases; Carotid intima-media thickness; Inflammation; Rheumatoid; Risk assessment.

Figures

Fig. 1 Flow diagram for the search...

Fig. 2 Pathophysiological association between rheumatoid arthritis...

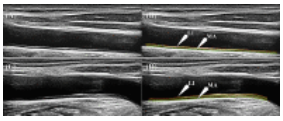

Fig. 3 Carotid ultrasound image of the...

Fig. 4 The generalized framework of supervised...

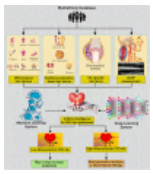

Fig. 5 AI framework for CVD risk...

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