BACKGROUND

Although activated immune system can induce depressive symptoms, the source of immune activation relevant to depression remains unclear. Multiple lines of studies indicate that inflammatory oral pathology can be a potential inducer of chronic neuromimmune response which can contribute to the genesis of depressive symptoms. The objective of this study was to summarize the evidence on the association between inflammatory periodontal diseases and depression mediated by or related to a broad range of biomarkers that are detectable in blood, cerebrospinal fluid, other circulatory fluid or local tissue exudate/secretion.

METHODOLOGY

Medline, Embase, PsyInfo, Cochrane Library, Web of Science and Scopus databases were searched from inception until November 25, 2020. Search terms included subject headings and synonyms for inflammatory periodontal disease and depression. Twenty-five studies that reported data on both depression and inflammatory periodontal disease as categories along with measurement of a biomarker were included. Data were extracted by two independent rates. Two reviewers independently selected the articles for inclusion and extracted information from each study. A third reviewer decided in case of discrepancy. We used the NHI 14 criteria quality assessment tool for evaluating each study quality. The protocol for this study is registered with PROSPERO, number CRD420201215524.

RESULTS

Twenty-five studies were included in the final review—eleven cross-sectional studies, ten case-control studies, four prospective cohort studies including three animal studies. Seven studies reported a positive association between depression and periodontal disease; one study reported a negative association and another seven studies found no such associations. The remaining studies did not report on the associations specifically, or assessments for the diseases were unstandardized. An association between a biomarker and IPD was reported by 17 studies of which 14 found an association; for MD the study numbers were 15 and 6, respectively. The biomarkers included blood, salivary, unknown and gingival crevicular fluid levels of CRP, Cortisol and other hormones, inflammatory cytokines (interleukin (IL)-1B, 6, 10, tumor growth factor, interferon-gamma) and brain derived neurotrophic factor; in most studies there were risks of bias due to the sample selection and assessment protocol. Limited number of studies for shared biomarkers using the same biological sample, and a wide heterogeneity of included samples precluded any possibilities of calculating pooled effects.

CONCLUSION AND FUTURE DIRECTIONS

Immuno-inflammatory contribution to depression was also evident in the context of inflammatory periodontal diseases, but whether biomarkers mediated associations between inflammatory periodontal disease and depression need to be tested through methodologically rigorous studies aiming specifically at this hypothesis.

Included studies