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Periodontitis associated with disease activity, immune aging and inflammatory cytokine of systemic lupus erythematosus patients

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Background: Periodontitis reported was more often found in SLE patients than healthy controls, 54.3% higher than that of patients with no systemic abnormality of 28.2% and the estimate was related to cytokine inflammatory because of the aging of immune system. Expression of IL-2 and IL-10 associated with immune aging as T cell CD28 and CD45RO, were associated with differentiation, cytotoxic activity, signaling and apoptosis of T cells were known as biomarker of immune aging.

Objectives: To analyze correlation between periodontitis severity with disease activity, IL-2, IL-10, CD28, and CD45RO expression in SLE patients.

Methods: Subjects were 45 patients with SLE (age 17-54 years; SLEDAI score 0-42) collected from Dr. Saiful Anwar General Hospital, Malang Indonesia. Periodontitis severity was measured using Periodontal Index (PI) criteria. Expression of IL-2 and IL-10 using ELISA and CD28, CD45RO was examined using flow cytometry.

Result: Clinical manifestations of periodontitis were bleeding gum 88.3%, high calculus index 44.9%, periodontal pocket 73.8% and loose teeth 13.2% among patients. PI score patients were 2.45±0.82. There was significantly positive correlation between PI score and SLEDAI score (r=0.798; p=0.000), with IL-2 (r=0.512; p=0.000), with IL-10 (r=0.720; p=0.000) with CD28 expression (r=0.634; p=0.000), and with CD45RO expression (r=0.354; p=0.020).

Discussion: CD28 expressed specific CD8+ cells and natural killer cells during the latent period of chronic infection, especially on SLE patient. Repeated and persistent stimulation of the antigen leads to increased CD expression in CD8+ T. T cell CD28+ CD8+ cells are more susceptible to activated cell-induced cell death, stimulated by mitogen. The evidence shows that this cell can be used as a SLE marker. Differentiated CD8+ T cells experience loss of CD28 expression and CD45RO re-expression. This cell effector capacity is evidenced by its high capacity to produce perforin, granzymes, IFN-γ, IL-2 and IL-10. In periodontitis, tissue damage also results from the production of various irregular and unregulated productions of inflammatory mediators and destructive enzymes in response to the presence of bacterial biofilms and the process of periodontitis.

Conclusion: Our study showed that periodontitis were associated with SLE disease activity and biomarker of immune aging. Furthermore, SLEDAI index and these markers could be predictor for periodontal condition, prognosis of periodontitis and best treatment for periodontitis on SLE patient.

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