Presence of anti-Porphyromonas *gingivalis*-peptidylarginine deiminase antibodies in serum from juvenile systemic lupus erythematosus patients

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To the Editor,

Periodontal disease is a group of chronic inflammatory diseases affecting tooth-supporting tissues. The early stage is the presence of biofilm-associated gingival inflammation which, in patients having juvenile systemic lupus erythematosus (SLE), might function as a reservoir of anaerobic Gram-negative bacteria such as *Porphyromonas gingivalis*. *Porphyromonas gingivalis* has been associated with an increased level of anticardiolipin and anti-β2-glycoprotein antibodies in patients with SLE, which implies periodontal disease as a modifiable risk factor for SLE morbility[1]. Besides, *Porphyromonas gingivalis* also express functional endogenous Peptidylarginine deiminase (PAD) enzymes, which catalyzes a citrullination reaction that can lead to formation of citrullinated peptides. PAD can frequently be recognized in sera of patients with rheumatoid arthritis, systemic lupus erythematosusand primary Sjögren syndrome[2]. Laugisch et al.[3] reported that PAD secreted by *Porphyromonas gingivalis* (PPAD) from patients having rheumatoid arthritis and periodontal disease may exert its citrullinating activity in distant regions of the periodontium. Although the relevance of PADs to the pathogenesis of SLE has been well reported[4,5] to the best of our knowledge, no evidence for the presence of PPAD in patients having SLE has been reported.

Thirty patients with jSLE (16.2±1.5 years-old) and 29 systemically healthy controls (15.4±2.3 years-old) were included in the study. The study protocol was approved by the Ethics Committee of Pedro Ernesto University Hospital (UERJ, Rio de Janeiro, Brazil – 380.686 / 2013 and amendment 2.284.225 / 2017. jSLE was diagnosed according to the criteria of the American College of Rheumatology[6]. The individuals underwent a full-mouth periodontal examination including sampling of intrasulcular plaque samples. All individuals were previously diagnosed with biofilm-associated gingival inflammation. Blood samples were taken and serum levels anti-PPAD IgG were determined by ELISA (as previously described by Shimada et al.[7]), and the results were expressed in arbitrary units (AU). The presence of *Porphyromonas gingivalis* was confirmed using the checkerboard DNA-DNA hybridization[8].

The median levels of anti-PPAD were 0.54 AU (0.40 – 0.77) in jSLE patients versus 0.48 AU (0.26 – 0.97) in the control group (p=0.95). However, the anti-PPAD levels in patients with jSLE who had arthritis (n=19) showed a tendency towards higher levels than in jSLE patients without arthritis (n=11) (0.59 [0.40 – 0.84] and 0.47 [0.47 – 0.58] AU, respectively; p= 0.064). Presence of *Porphyromonas gingivalis* was detected in both jSLE and controls without any significant difference between the groups (p=0.58) (Figure 1).

This is the first study to report the presence of anti-PPAD antibodies in serum from jSLE patients. The implications of these results need to be investigated, however the pathogenic role of PPAD in autoimmune diseases has been widely described[7, 9]. Kobayashi et al.[10] reported that serum IgG levels to PPAD might affect the clinical response to biological disease-modifying anti-rheumatic drug in patients with rheumatoid arthritis. It is possible that a negative effect might also be observed in the treatment of other autoimmune diseases, such as SLE.

The patients analyzed in our study presented a generalized inflammation in the gingiva caused by oral biofilm formation. Such biofilm tested positive for the presence of *Porphyromonas gingivalis*, suggesting that a special oral care attention should be given for jSLE pa-

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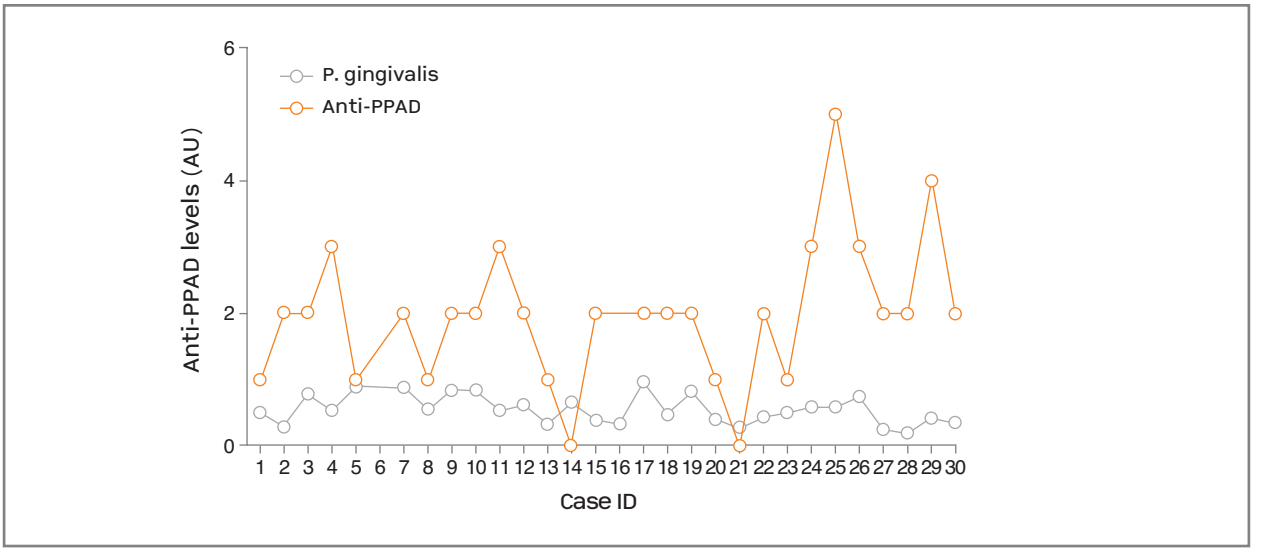

FIGURE 1. Levels of anti-PPAD and *Porphyromonas gingivalis* in 30 patients having juvenile systemic lupus erythematosus and diagnosis of biofilm-associated gingival inflammation.

tients to avoid biofilm formation around teeth and, consequently, the production of PPAD enzymes.

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