

Periodontal disease severity is related to high levels of C-reactive protein in pre-eclampsia

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Objective Recent studies have shown that pre-eclamptic women present a high prevalence of periodontitis, suggesting that active periodontal disease may play a role in the pathogenesis of pre-eclampsia. The present study analysed the effect of periodontal disease in the concentrations of serum high-sensitivity C-reactive protein (hs-CRP), and its association with pre-eclampsia.

Methods A case-control study was carried out in Cali-Colombia, comprised of 398 pregnant women (145 cases and 253 controls) who were believed to have periodontal disease, between 28 and 36 weeks of gestational age. Pre-eclampsia cases were defined as blood pressure $\geq 140/90$ mmHg and proteinuria ≥ 0.3 g/24 h. Controls were pregnant women with normal blood pressure, without proteinuria, matched by maternal age, gestational age and body mass index. Sociodemographic data, obstetric risk factors, periodontal state, subgingival microbial composition and hs-CRP levels were determined in both groups.

Results The case and control groups were comparable for sociodemographic characteristics. In women with pre-eclampsia and confirmed periodontal disease ($n = 138$), hs-CRP levels increased according to the severity of the disease (gingivitis median 4.14 mg/dl; mild periodontitis median 4.70 mg/dl; moderate/severe periodontitis median 8.8 mg/dl; $P = 0.01$). A similar tendency was observed in controls with periodontal disease

($n = 251$), but it did not reach statistical significance (gingivitis median 5.10 mg/dl; mild periodontitis median 5.12 mg/dl; moderate/severe periodontitis median 6.90 mg/dl; $P = 0.07$). A significant difference in hs-CRP levels was observed in pre-eclamptic women with moderate/severe periodontitis compared to controls ($P = 0.01$).

Conclusion These findings suggest that chronic periodontitis may increase hs-CRP levels in pregnant women and lead to complications such as pre-eclampsia. *J Hypertens* 25:1459–1464 © 2007 Lippincott Williams & Wilkins.

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Introduction

Early treatment of urinary and vaginal infections can decrease the incidence of pre-eclampsia [1], suggesting that infection may have a role in the pathology of this disease. Periodontal disease is a chronic oral infection that exposes the host to microbial challenge, bacterial antigens and virulence factors, leading to persistent inflammation [2]. Studies addressing the relationship between periodontitis and adverse pregnancy outcomes have shown that women with poor oral health may be at higher risk of developing pregnancy complications such as preterm delivery and low birth weight [3,4]. Recently, several studies have shown that pre-eclamptic women have a higher prevalence of periodontitis and periodontal destruction [5–7]. In Cali (Colombia), 30–50% of the

general population has some degree of periodontal disease. We have demonstrated that, in our population, after adjusting for other risk factors, chronic periodontal disease was significantly associated with pre-eclampsia [8]. In that study, 54% of the pregnant women included presented periodontal disease.

It has been proposed that inflammation plays a role in the pathogenesis of cardiovascular disease and adverse pregnancy outcomes [9–12]. C-reactive protein (CRP) is an acute phase marker of inflammation and an increase in its plasmatic levels is related with tissue damage [9,10]. CRP has been assessed as a marker of inflammation in hypertensive disorders of pregnancy [13]. We have previously reported that pre-eclampsia courses with increased levels