

Obesity during pregnancy and its oral repercussions: what is the current evidence?

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Dear editor,

Periodontal medicine is a field that has been in evidence in recent years due to the increased number of diseases and conditions that have been linked to periodontitis¹. A systematic review on periodontal medicine indicated 57 different conditions that may be associated with periodontal disease, among them, the pregnancy².

During pregnancy, physiological, immunological and hormonal changes occur in the women's body. Considering the high levels of estrogen and progesterone and the reduced antimicrobial activity of peripheral neutrophils, pregnant women are more prone to acute periodontal inflammation even with a small amount of dental plaque³.

Obesity is a chronic and inflammatory disease that has been considered one of the biggest public health problems⁴. In Brazil, 63.3% and 30.2% of women are considered with overweight and obesity, respectively⁵.

There is strong evidence to associate obesity with periodontitis⁶⁻⁸. This association is explained by the adipose tissue of overweight patients secreting inflammatory mediators, such as TNF- α , IL-6, adiponectin, leptin and resistin, reducing the host's immune response and causing a generalized inflammatory state of the body⁶⁻⁸. Therefore, in the presence

of dental plaque, obese patients present an exacerbated inflammatory response of the periodontal tissues.

Considering the synergistic effect of pregnancy and obesity on periodontal tissues, previous studies have investigated the association of these outcomes in pregnant women⁹⁻²⁰. Most of them showed a positive association between maternal excessive weight and periodontitis^{9-18,20}, and also associated maternal overweight with other systemic disorders, such as arterial hypertension and gestational diabetes mellitus, which in turn may further damage periodontal tissues.

Foratori-Junior et al.¹⁷ (2020) conducted a longitudinal study in which they evaluated overweight/obese women during the 2nd and 3rd trimesters of pregnancy and also after delivery. The authors pointed out that overweight/obese women had a higher prevalence of periodontitis during pregnancy and this condition remained even with the reduction of hormone levels after childbirth.

It is important to highlight that some limitations were found among those studies that sought to assess the association of these outcomes during pregnancy. Most of them had a cross-sectional design, which makes it impossible to understand the cause-and-effects relationship between the outcomes. In addition, they differ in relation to the sample size, cutoff points of the BMI to classify excessive weight and, mainly, to the classification for periodontitis. These divergences make it difficult to compare studies.

It is known that maternal periodontitis may result in negative perinatal outcomes, being associated with a doubled risk of prematurity²¹ and with low birth weight²². Therefore, the holistic care of women during pregnancy is necessary, considering their systemic involvement.

As future perspectives, it is expected that population-based longitudinal studies will be conducted in order to better understand the association of obesity and periodontitis during pregnancy. In addition, studies at biological levels are also important, aiming to identify the plausible pathophysiological mechanisms of the association of these outcomes and, possibly, to identify biomarkers that serve as instruments for us to adopt adequate protocols in the management of periodontitis during pregnancy in women affected by obesity

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References

1. Beck JD, Papapanou PN, Philips KH, Offenbacher S. Periodontal medicine: 100 years of progress. *J Dent Res.* 2019 Sep;98(10):1053-62. doi: 10.1177/0022034519846113.

2. Monsarrat P, Blaizot A, Kémoun P, Ravaud P, Nabet C, Sixou M, et al. Clinical research activity in periodontal medicine: a systematic mapping of trial registers. *J Clin Periodontol*. 2016 May;43(5):390-400. doi: 10.1111/jcpe.12534.
3. Silva de Araujo Figueiredo C, Gonçalves Carvalho Rosalem C, Costa Cantanhede AL, Abreu Fonseca Thomaz ÉB, Fontoura Nogueira da Cruz MC. Systemic alterations and their oral manifestations in pregnant women. *J Obstet Gynaecol Res*. 2017 Jan;43(1):16-22. doi: 10.1111/jog.13150.
4. Foratori-Junior GA, Andrade FJP de, Mosquim V, Peres M de CS, Chaim EA, Sales-Peres SH de C. Association of metabolic syndrome with oral and systemic conditions in morbidly obese patients. *Braz J Oral Sci*. 2019 Apr;18:e191484. doi: 10.20396/bjos.v18i0.8655299.
5. Brazilian Institute of Geography and Statistics. [National Health Survey 2019: Primary health care and anthropometric information]. Rio de Janeiro: Brazilian Institute of Geography and Statistics; 2020. 57p. Portuguese. Available from: <https://biblioteca.ibge.gov.br/index.php/biblioteca-catalogo?view=detalhes&id=2101758>.
6. Moura-Grec PG, Marsicano JA, Carvalho CA, Sales-Peres SH. Obesity and periodontitis: systematic review and meta-analysis. *Cien Saude Colet*. 2014 Jun;19(6):1763-72. doi: 10.1590/1413-81232014196.13482013.
7. Keller A, Rohde JF, Raymond K, Heitmann BL. Association between periodontal disease and overweight and obesity: a systematic review. *J Periodontol*. 2015 Jun;86(6):766-76. doi: 10.1902/jop.2015.140589.
8. Khan S, Barrington G, Bettiol S, Barnett T, Crocombe L. Is overweight/obesity a risk factor for periodontitis in young adults and adolescents?: a systematic review. *Obes Rev*. 2018 Jun;19(6):852-83. doi: 10.1111/obr.12668.
9. Chapper A, Munch A, Schermann C, Piacentini CC, Fasolo MT. Obesity and periodontal disease in diabetic pregnant women. *Braz Oral Res*. 2005 Apr-Jun;19(2):83-7. doi: 10.1590/s1806-83242005000200002.
10. Piscocoy MD, Ximenes RA, Silva GM, Jamelli SR, Coutinho SB. Periodontitis-associated risk factors in pregnant women. *Clinics (Sao Paulo)*. 2012;67(1):27-33. doi: 10.6061/clinics/2012(01)05.
11. Vogt M, Sallum AW, Cecatti JG, Morais SS. Factors associated with the prevalence of periodontal disease in low-risk pregnant women. *Reprod Health*. 2012 Jan 24;9:3. doi: 10.1186/1742-4755-9-3.
12. Lee HJ, Jun JK, Lee SM, Ha JE, Paik DI, Bae KH. Association between obesity and periodontitis in pregnant females. *J Periodontol*. 2014 Jul;85(7):e224-31. doi: 10.1902/jop.2014.130578.
13. Xie Y, Xiong X, Elkind-Hirsch KE, Pridjian G, Maney P, Delarosa RL, et al. Prepregnancy obesity and periodontitis among pregnant females with and without gestational diabetes mellitus. *J Periodontol*. 2014 Jul;85(7):890-8. doi: 10.1902/jop.2013.130502.
14. Zambon M, Mandò C, Lissoni A, Anelli GM, Novielli C, Cardellicchio M, et al. Inflammatory and oxidative responses in pregnancies with obesity and periodontal disease. *Reprod Sci*. 2018 Oct;25(10):1474-84. doi: 10.1177/1933719117749758.
15. Fusco NDS, Foratori-Junior GA, Missio ALT, Jesuino BG, Sales-Peres SHC. Systemic and oral conditions of pregnant women with excessive weight assisted in a private health system. *Int Dent J*. 2019 Dec;69(6):472-9. doi: 10.1111/idj.12507.
16. Caracho RA, Foratori-Junior GA, Fusco NDS, Jesuino BG, Missio ALT, Sales-Peres SHC. Systemic conditions and oral health-related quality of life of pregnant women of normal weight and who are overweight. *Int Dent J*. 2020 Aug;70(4):287-95. doi: 10.1111/idj.12547.
17. Foratori-Junior GA, da Silva BM, da Silva Pinto AC, Honório HM, Groppo FC, de Carvalho Sales-Peres SH. Systemic and periodontal conditions of overweight/obese patients during pregnancy and after delivery: a prospective cohort. *Clin Oral Investig*. 2020 Jan;24(1):157-65. doi: 10.1007/s00784-019-02932-x.

18. Foratori-Junior GA, Jesuino BG, Caracho RA, Orenha ES, Groppo FC, Sales-Peres SHC. Association between excessive maternal weight, periodontitis during the third trimester of pregnancy, and infants' health at birth. *J Appl Oral Sci.* 2020 Mar;28:e20190351. doi: 10.1590/1678-7757-2019-0351.
19. Gomes-Filho IS, Batista JET, Trindade SC, Passos-Soares JS, Cerqueira EMM, Costa TSD, et al. Obesity and periodontitis are not associated in pregnant women. *J Periodontol Res.* 2020 Jan;55(1):77-84. doi: 10.1111/jre.12690.
20. Foratori-Junior GA, Missio ALT, Orenha ES, de Carvalho Sales-Peres SH. Systemic condition, periodontal status, and quality of life in obese women during pregnancy and after delivery. *Int Dent J.* 2021 Jan:S0020-6539(20)36543-6. doi: 10.1016/j.identj.2020.12.012.
21. Manrique-Corredor EJ, Orozco-Beltran D, Lopez-Pineda A, Quesada JA, Gil-Guillen VF, Carratala-Munuera C. Maternal periodontitis and preterm birth: Systematic review and meta-analysis. *Community Dent Oral Epidemiol.* 2019 Jun;47(3):243-51. doi: 10.1111/cdoe.12450.
22. Figuero E, Han YW, Furuichi Y. Periodontal diseases and adverse pregnancy outcomes: Mechanisms. *Periodontol 2000.* 2020 Jun;83(1):175-88. doi: 10.1111/prd.12295.