No Association between Gestational Diabetes Mellitus (GDM) and Periodontitis; a Case-Control Study

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Abstract

- Gestational diabetes mellitus (GDM) is a systemic disorder identified with glucose intolerance, which is first diagnosed during gestation. The aim of the present study is to investigate the potential association between GDM and periodontitis.
- Despite a higher incidence of periodontitis among the individuals of the GDM group, the association between GDM and periodontitis was not statistically significant.

Introduction

- Periodontitis is a common chronic inflammatory disease destroying tooth-supporting tissues called periodontium. It is caused as a result of polymicrobial plaque accumulation (1). It is considered as the sixth most prevalent disease worldwide (2).
- GDM is a hyperglycemic status defined as glucose intolerance, which is first diagnosed during pregnancy (3). This disease is a multifactorial condition and is associated with other systemic inflammations.
- Among large number of studies on periodontitis and GDM, some suggested more frequency of periodontitis among women having GDM (4,5).
- However, other studies indicated that there is no association between periodontitis and GDM (6).
- As a result of these controversial findings, this paper aims to investigate whether there is an association between these two diseases.

Methods and Materials

- 157 Pregnant women (53 cases diagnosed with GDM and 104 women lacking GDM diagnostic criteria as controls) enrolled in the study.
- All pregnant women underwent a GDM screening test between 24-28 weeks of gestation. The patient was diagnosed as having GDM if the 2-hour plasma glucose was ≥ 140 mg/dL.
- Diagnostic criteria for periodontitis in the present study were: having ≥ four teeth exhibiting at least one site of periodontal pocket depth (PPD) ≥ 4mm and clinical attachment loss (CAL) ≥ 3mm at the same site accompanied by inflammation and bleeding on probing (BOP).

Results

- Higher levels of BOP levels in GDM group ($P < 0.05$)
- Higher prevalence of periodontitis in the GDM group; the difference is not designated to be significant ($P = 0.26$)
- Significantly higher incidence of the previous history of diabetes mellitus in the GDM group ($P < 0.005$)

Table1. Demographic, Clinical, and Periodontal Characteristics of the Patients

Variables	Pregnant Women with GDM (n=53)	Pregnant Healthy Controls (n=104)	P-value
Age (Years)	29.4 ± 4.8	26.7 ± 4.9	P < 0.001
BMI (Kg / m^2)	29.7 ± 4.6	27.9 ± 3.9	P < 0.01
History of Diabetes Mellitus, n (%)			
• Yes	25 (47.2%)	26 (25.0%)	P < 0.005
• No	28 (52.8%)	78 (75.0%)	
Number of Teeth (n)	27.2 ± 2.1	26.5 ± 2.5	
Frequency of Toothbrushing, n (%)			
• Once / day	21 (39.6%)	54 (51.9%)	
• Twice/ day	11 (20.8%)	42 (40.4%)	P < 0.0001
• Sometimes	12 (22.6%)	8 (7.7%)	
• Never	9 (17.0%)	0	
Bleeding on Toothbrushing, n (%)			
• Yes	32 (60.4%)	54 (51.9%)	P = 0.31
• No	21 (39.6%)	50 (48.1%)	
Use of Mouthwash, n (%)			
• Yes	4 (7.5%)	7 (6.7%)	P = 0.85
• No	49 (92.5%)	97 (93.3%)	
Periodontitis, n (%)			
• Yes	31 (58.5%)	51 (49.0%)	P = 0.26
• No	22 (41.5%)	53 (51.0%)	
Self-Reported Periodontitis, n (%)			
• Yes	9 (17.0%)	7 (6.7%)	P = 0.05
• No	44 (83.0)	97 (93.3%)	
BOP (%)	57.9 ± 25.1%	49.6 ± 25.5%	P < 0.05
Last Visit for Scaling, n (%)			
• ≤ 6 Months	0	10 (9.6%)	
• 6-12 Months	6 (11.3%)	7 (6.7%)	P = 0.17
• 1-2 Years	6 (11.3%)	9 (8.7%)	
• ≥ 2 Years	13 (24.5%)	28 (26.9%)	
• Never	28 (52.8%)	50 (48.1%)	

Discussion

- In the present study, a higher prevalence of periodontitis was recognized among the GDM group (58.5%) than those of healthy controls (49.0%), although this difference was not significant. On the other hand, women having GDM showed significantly higher levels of BOP compared to subjects in the control group. This higher BOP may be a sign of inflammatory processes and an alteration in the proportion of cytokines in patients having GDM.
- As well, we obtained better oral hygiene among women in the control group than those having GDM.

Conclusions

- The results of the present study demonstrate that periodontitis is not associated with GDM. However, future studies are required to validate these findings. Due to the high prevalence of periodontitis among pregnant women, clinicians should pay special attention to diagnose and treat it to decrease the upcoming complications both for mothers and their offspring.
- This study was a case-control study with large sample size. Increasing the knowledge about risk factors of GDM can help us prevent further type 2 diabetes mellitus. The weakness of our study was that we had no immunological and genetic factors involved. Future evaluations may lead to more detailed result discovering the underlying mechanisms controlling periodontal alterations in diabetic patients.

Future Directions

- The results of the present study demonstrate that periodontitis is not associated with GDM. However, future studies are required to validate these findings.

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References

1. .Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. Lancet (London, England). 2005;366(9499):1809-20.
2. Masi S, D'Aiuto F, Deanfield J. Cardiovascular prevention starts from your mouth. European heart journal. 2019;40(14):1146-8.
3. standards of medical care in diabetes--2008. Diabetes care. 2008;31 Suppl 1:S12-54.
4. Chaparro A, Zuniga E, Varas-Godoy M, Albers D, Ramirez V, Hernandez M, et al. Periodontitis and placental growth factor in oral fluids are early pregnancy predictors of gestational diabetes mellitus. Journal of periodontology. 2018;89(9):1052-60.
5. Kumar A, Sharma DS, Verma M, Lamba AK, Gupta MM, Sharma S, et al. Association between periodontal disease and gestational diabetes mellitus-A prospective cohort study. Journal of clinical periodontology. 2018;45(8):920-31.
6. Kalra M, Tangade P, Punia H, Gupta V, Sharma H, Jain A. Assessment of two-way relationship between periodontal disease and gestational diabetes mellitus: A case-control study. Indian journal of dental research : official publication of Indian Society for Dental Research. 2016;27(4):392-6.

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