

Oral Contraceptives Are Associated with a Higher Risk of Dental Inflammatory and Bleeding Disorders

Asmaa Sami Jawad¹

¹College of Dentistry, University of Babylon, Babylon, Iraq

Abstract

Objective: Oral contraceptive pills (OCPs) are a prevalent form of contraception, yet their association with potential impacts on gingival and periodontal health remains a subject of interest. Prolonged utilization of OCPs, attributable to elevated pro-inflammatory cytokines and prostaglandins, has been demonstrated to heighten the risk of developing periodontal disease. This heightened risk is hypothesized to result from the presence of hormone receptor-positive cells within gingival tissue. **Methods:** The cross-sectional study was conducted from January 2023 to March 24. Drug-naïve controls (n = 50) were participants who had not received any pharmaceutical therapy, whereas cases were participants who had received just OCPs (ethinyl estradiol 0.03 mg or levonorgestrel 0.15 mg) for at least six months. **Results:** Women aged 20–45 were referred to the dentist for a check-up. There were no differences ($p > 0.05$) between the control and case groups for BMI, blood glucose, fasting, or kidney function tests. However, there were differences ($p < 0.05$) in cholesterol and liver enzyme levels. According to the study, 30% of cases had localized or chronic periodontitis, while 60% of the participants had a widespread aggressive disease. Additionally, research found higher but not statistically significant amounts of plaque, gingivitis, and bleeding in the case group. Compared to non-users, case women had average probing depths that were deeper. **Conclusion:** The study found that young women with aggressive gum disease, especially those with generalized aggressive periodontitis, tended to use the pill. These women also had higher levels of plaque.

Open Access

Citation: Jawad AS. (2025) Oral Contraceptives Are Associated with a Higher Risk of Dental Inflammatory and Bleeding Disorders. *Dentistry 3000*. 1:a001 doi:10.5195/d3000.2025.874
Received: March 5, 2025
Accepted: April 26, 2025
Published: June 9, 2025
Copyright: © 2025 Jawad AS. This is an open access article licensed under a Creative Commons Attribution Work 4.0 United States License.
Email: dent.asmaa.sami@uobabylon.edu.iq

Introduction

Oral contraceptive pills (OCPs) are a widely utilized and convenient method of contraception. Their utilization has been associated with potential impacts on the progression of gingival and periodontal diseases in women [1]. The impact of oral contraceptives on gingival microvasculature is well-documented. Human gingiva contains progesterone and oestrogen receptor-positive cells, and

prolonged use of hormonal contraceptives has been shown to increase the risk of periodontal disease. Elevated levels of pro-inflammatory cytokines and prostaglandins resulting from prolonged use and elevated dosage have been identified as key factors in this increased risk [2].

Hormonal contraceptives have been demonstrated to heighten the likelihood of alveolar osteitis in the aftermath of tooth extraction, concomitantly augmenting the prevalence of

the *Candida* species within the oral environment. These medications also exert an influence on the periodontium, manifesting in the recurrent emergence of gingivitis, yet do not induce alterations in the composition of the salivary microbiome [3,4]. Hormonal intrauterine devices (IUDs), which have seen a surge in popularity following the introduction of Mirena® in 2001 [5], consist of polydimethylsiloxane for controlled release and 52 mg of levonorgestrel in a T-shaped form.

This non-abortive technique works by stopping conception and lasts for at least five years [6].

The increasing utilization of hormonal contraceptives among women emphasizes the need for a systematic evaluation, as do their possible effects on the oral mucosa. This study's goal was to compile data regarding the possible oral symptoms that these contraceptive methods may cause in women of reproductive age.

Material and Methods

The Department of Obstetrics and Gynecology at the University of Kufa gave its approval for the cross-sectional study, which took place between January 2023 and March 24 [No. f (BORS-Gynecological Science, Res/KU/15-10, 2023-6479)]. The participants provided informed written consent. It has been established that cases of periodontal destruction diagnosed in obstructive and gynecology clinics have led to patients being referred to general dental clinics for further examination. The purpose of this referral is to confirm and validate the diagnosis of aggressive periodontitis through a specialized assessment and evaluation. Furthermore, the collaboration between these clinics ensures a multidisciplinary approach to patient care, addressing both oral health and systemic conditions effectively. Participants with normal menstrual periods, normo-androgenic traits (no alopecia, acne, or acanthosis), and no polycystic ovaries were recruited from the obstetrics and gynecology clinics. Drug-naïve controls ($n = 50$) were subjects not receiving any pharmaceutical therapy, whereas cases ($n = 50$) were subjects who had received just OCPs (ethinyl estradiol 0.03 mg or levonorgestrel 0.15 mg) for at least six months.

The thyroid, liver, and kidneys of every woman were functioning normally. The exclusion criteria included coronary artery disease, diabetes, thyroid dysfunction, hyperprolactinemia, androgen-producing tumors, non-classic adrenal hyperplasia, Cushing's syndrome, pregnancy, breastfeeding, coagulation disorders, medication history, and smoking status.

Multivariate regression analysis was performed to adjust for potential confounders. All statistical tests were two-tailed, and confidence intervals (CIs) were calculated at the 95% level. Data visualization was conducted using graphs and charts generated in GraphPad Prism 8.1 to facilitate interpretation of the findings.

Results

Using the provided referral screening form, general dentists identified female patients

between the ages of 20 and 45 and referred them for a thorough periodontal examination. The data relating to the basic clinical characteristics of the control subjects and the OCP-treated cases are shown in Table 1 and Figure 1. We found that there were insignificant differences ($p > 0.05$) when compared the control BMI and blood glucose, fasting, renal function test (creatinine, blood urea) with case group, while significant differences ($p < 0.05$) were found in cases as compared to controls for lipid profile (cholesterol, TG), and liver enzymes (SGPT and SGOT).

Most cases of generalized aggressive disease were observed in patients with the condition (60%), compared to 30% of people who have chronic or localized severe periodontitis. The case group tended to have higher levels of bleeding, plaque, and gingivitis. This disparity did not, however, reach statistical significance. In comparison to non-users, case women had mean probing depths that were deeper (3.3–1.0 versus 2.7–0.5 mm) ($P = 0.04$) (Table 2 and Figure 2).

Discussion

A plethora of studies have been conducted on the utilization of OCPs as a primary form of birth control, yielding a substantial body of evidence that supports this approach. A notable finding from these studies is that women who have used OCPs exhibit elevated average lipid levels in comparison to those who have not used them. Moreover, there is a higher likelihood of abnormally high total cholesterol and TG levels among users of OCPs [7,8].

Age explained 34% of the observed variance, according to the analysis. However, because of the study population's extremely narrow age range, this result was determined to be statistically inconsequential. The current research has important ramifications for counseling young female patients with advanced periodontitis who are thinking about using contraceptives [9,10]. Preshaw et al.'s result that oral contraceptives had no effect on gingival response might not apply to the current cohort because a significant percentage of research participants had been using contraceptives for a long period. Further research is required, especially in light of Preshaw et al.'s finding that there were no discernible differences in gingival inflammation between pill users and non-users during a brief period of time [11].

According to Taichman and Ekland's research, there is no correlation between using oral contraceptives and a higher incidence of periodontitis or gingivitis. Their findings, which were based on data from 4,930 premenopausal women in NHANES I and

5,001 in NHANES II, suggested a slight protective advantage of contraceptive medication. This research disproves previous theories on the damaging effects of oral contraceptives on the periodontium [12].

Conclusions

The study found that a lot of young women with aggressive periodontal disease, especially those diagnosed with generalized aggressive periodontitis, were using the pill. These women also had high levels of plaque.

References

1. Prachi S, Jitender S, Rahul K, Jitendra K, Priyanka M, Disha S. Impact of oral contraceptives on periodontal health. *Afr Health Sci*. 2019;19(1):1795-800.
2. Mistry S, Bhowmick DC. Oral contraceptive pill induced periodontal endocrinopathies and its management: A case report. *European Journal of Dentistry*. 2012;6(03):324-9.
3. Rojo MG, Lloret MRP, Gironés JG. Oral manifestations in women using hormonal contraceptive methods: a systematic review. *Clin Oral Investig*. 2024;28(3):184.
4. Hassan SM, al-Jaf ANA, Hussien YA, Awad SM, Hadi NR. The potential antiviral activity of a novel pyrimidine derivative against Herpes Simplex Virus type-1 (HSV-1). *Rev Pharm*. 2020;11:795-806.
5. Hsia JK, Creinin MD, editors. *Intrauterine contraception. Seminars in reproductive medicine*; 2016: Thieme Medical Publishers.
6. Blumenthal PD, Edelman A. Hormonal contraception. *Obstetrics & Gynecology*. 2008;112(3):670-84.
7. Hashemi SJ, Khezri R, Saki N, Nasehi N, Hosseini SA, Harizi M, Rahimi Z. Association between oral contraceptives with lipid profile: results from Hoveyeh cohort study (HCS). *BMC Womens Health*. 2023;23(1):552.
8. Abbas Al-Huseini LM, Al-Mudhaffer RH, Hassan SM, Hadi NR. DMF ameliorating cerebral ischemia/ reperfusion injury in Male Rats. *Systematic Reviews in Pharmacy*. 2019;10(1):206-13.
9. Abbas SN, Alwan TS, Hassan SM. Correlation between Diabetes Mellitus and Dyslipidemia Incidence in Center of Iraq. 2023.
10. Ahjel SW, Hassan SM, Hussein SF, Hadi NR, Awad SM. Antineoplastic Effect of New Synthesized Compounds of 2-Thiouracil Sulfonamide Derivatives against Ovarian and Breast Carcinoma Cells" *In Vitro Study*". *Systematic Reviews in Pharmacy*. 2020;11(4).
11. Preshaw PM, Knutsen MA, Mariotti A. Experimental gingivitis in women using oral contraceptives. *J Dent Res*. 2001;80(11):2011-5.
12. Taichman LS, Eklund SA. Oral contraceptives and periodontal diseases: rethinking the association based upon analysis of National Health and Nutrition Examination Survey data. *J Periodontol*. 2005;76(8):1374-85.

Parameters	Mean $\pm$ SD (Controls)	Mean $\pm$ SD (Cases)	P value	significant
Age	34.32 $\pm$ 1.83	35.16 $\pm$ 1.86	0.932	No
BMI (kg/m ²)	22.51 $\pm$ 3.71	23.61 $\pm$ 3.53	0.911	No
Blood glucose fasting (mg/dl)	97.90 $\pm$ 10.98	99.82 $\pm$ 5.84	0.845	No
Cholesterol (mg/dl)	153.40 $\pm$ 10.2	189.24 $\pm$ 9.85	0.002	Yes
Triglycerides (mg/dl)	111.32 $\pm$ 13.78	163.58 $\pm$ 12.89	0.000	Yes
S. Creatinine (mg/dl)	0.88 $\pm$ 0.15	0.96 $\pm$ 0.50	0.981	No
Blood Urea (mg/dl)	31.42 $\pm$ 4.60	27.71 $\pm$ 5.95	0.707	No
SGPT (IU/L)	20.92 $\pm$ 4.06	59.15 $\pm$ 3.21	0.001	Yes
SGOT (IU/L)	26.09 $\pm$ 3.54	57.56 $\pm$ 2.43	0.003	Yes

Table 1. The anthropometric and biochemical parameters of the controls (i.e. those not previously exposed to the drug) and cases (i.e. those treated with OCP) were analyzed.

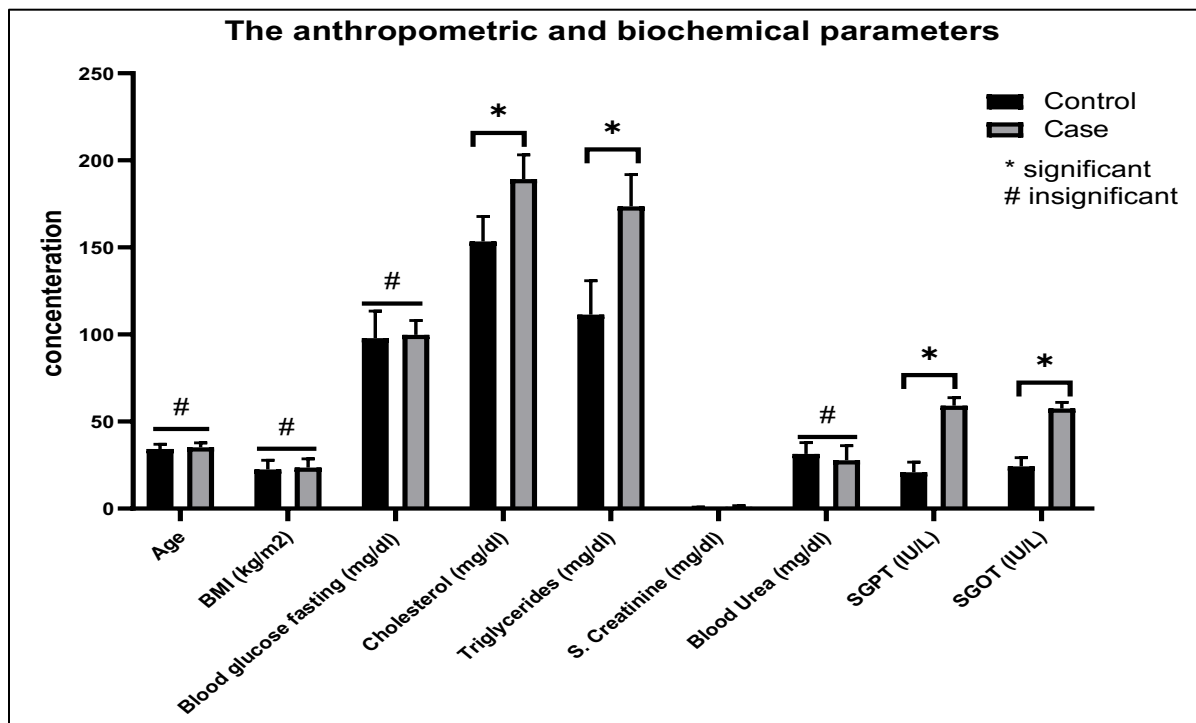


Figure 1. Anthropometric and biochemical parameters of the control and case groups have been presented as mean values with standard deviations (SD).

Parameters	Mean $\pm$ SD (Controls)	Mean $\pm$ SD (Cases)	P value	significant
Generalized Aggressive (n)	40	60	0.010	Yes
Localized Aggressive (n)	70	30	0.000	Yes
Plaque %	30.1 $\pm$ 4.2	69.9 $\pm$ 4.0	0.000	Yes
Gingivitis %	20.7 $\pm$ 9.12	79.3 $\pm$ 9.18	0.000	Yes
BOP %	53.5 $\pm$ 5.34	44 $\pm$ 5.31	0.173	No
Mean Probing Depth (mm)	2.7 $\pm$ 0.5	3.3 $\pm$ 1.0	0.021	Yes

Table 2. A different type of periodontitis that can be used to refer patients to the dentist for treatment.

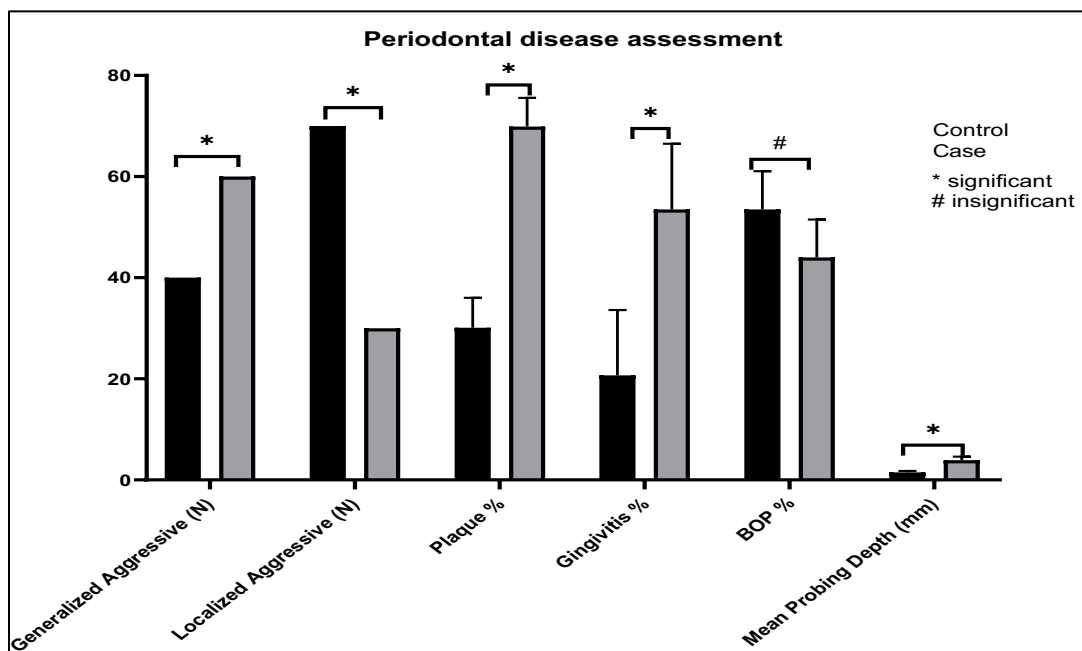


Figure 2. Periodontitis assessments.