



Awareness about the Effect of Contraceptive Drugs in the Oral and Periodontal Health among Women in Reproductive Age in Military Hospital at Omdurman (Sudan) in 2018_2019

**Dalia Ahmed Gasm El Seed^{a#*}, Rayan Ismail^b,
Tasneem Abd. Elraheem^b, Saja Osman^b and Habab Asim^b**

^a *Periodontics Department, Program of Dentistry, Napata College, Khartoum, Sudan.*

^b *College of Dentistry, Karary University, Omdurman, Sudan.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/99644>

Original Research Article

Received: 01/03/2023

Accepted: 02/05/2023

Published: 09/05/2023

ABSTRACT

Background: Oral contraceptives OCs drugs considered as a risk factor for the initiation and progression of periodontal diseases. They affect the oral health by causing gingival redness, bleeding, enlargement, tooth mobility and reduce the quality of female's life.

Aims: The aims of this study were to assess the awareness of women at reproductive age about the effect of oral contraceptive drugs on their periodontal and oral health, assess knowledge about the effect of contraceptive pills on the periodontal health and assess oral hygiene habits among women using contraceptive pills.

Assistant Professor of Periodontology;

*Corresponding author: Email: dalia_ahmed11111@yahoo.com;

Methodology: We conducted a descriptive cross-sectional study in Military hospital in Omdurman, Sudan, from December 2018 to March 2019. A designed questionnaire was used to collect data. We collected data on demographic such as age and educational level, awareness about OCs drugs and their effect on oral and periodontal health and the oral hygiene practice of women at reproductive age. We followed convenience method to select study participants. Data were analyzed by SPSS version 23 and in frequencies and proportions were calculated. Results presented in tables and graphs.

Results: A total number of 205 women, with mean age 31 were selected to participate in this study. 85% of investigated women used OCs drugs for more than one year. Most of the study participants (54%), their educational level was university. Almost, 91% of women did not aware that OCs drugs affect the periodontal and oral health and 77% of them didn't get scaling after they begin using OCs drugs. Regarding oral hygiene habits, 53.2 % of women brushed their teeth twice per day and 92% used fluoriated tooth paste.

Conclusion: This study demonstrates that high percentage of women at reproductive age who used OCs drugs didn't aware about the effects of these drugs on their oral and periodontal health.

Keywords: Awareness; contraceptive drugs; oral and periodontal health.

ABBREVIATIONS

OCs : Oral Contraceptives
OCPs : Oral Contraceptive Pills
GCF : Gingival Crevicular Fluid
PMNL : Poly Morpho Nuclear Leukocyte

1. INTRODUCTION

Oral health has strong biological, psychological and social consequences because it affects aesthetics, communication, and quality of life. Good oral health is important for proper mastication, digestion, appearance, speech and all body health [1]. Oral cavity is more susceptible for harmful bacteria than other parts of the body. The body natural defenses and good oral health care such as daily brushing and flossing are important because they can help in removal of bacteria and reduce the severity of chronic inflammatory periodontal diseases, which are seen to progress faster interdentally, so plaque control in these areas is of great benefit [2].

Gingival disease is one of the most common human diseases. The signs of gingival disease like chronic gingivitis may include redness, bleeding and swollen of the gingiva, this condition can be affected by change in hormones, the oral contraceptive pills (OCPs) are one of the systemic risk that can change hormonal condition and exaggerates or modified the body response to dental plaque and cause chronic gingivitis [3]. Oral contraceptive pills (OCPs) are one of the most commonly used methods of birth control by women worldwide to prevent pregnancy, available as two types one with only progesterone other with a combination of

estrogen and progesterone called combined oral contraceptive pills, the effect of these hormone in periodontal tissue include: about estrogen: stimulates the proliferation of gingival fibroblast, synthesis and maturation of gingival connective tissue and increase in the quantity of gingival inflammation with no increased in plaque accumulation, decrease keratinization, reduce the inflammation mediated by T cell, decrease the leukocyte production from the bone marrow and inhibits the PMNL chemotaxis. About the progesterone: increase vascular dilation, thus increase permeability and increase in GCF (Gingival Crevicular Fluid), also increase producing of prostaglandin E₂, inhibits proliferation of gingival fibroblast and collagen and non collagen fibers synthesis in periodontal fibroblast(3). Emergency contraceptive pills are as well available. They are recently fourth generation OCPs, they are also market as mono-phasic or multi-phasic depending on frequency and dosage of hormone given over cycle of therapy. Currently available OCPs have low doses of estrogen (0.05mg/day) and progestin (1.5mg/day) [3].

Oral contraceptive (OCs) drugs may enhance periodontal breakdown by reducing the resistance to dental plaque and may induce gingival inflammation and enlargement in otherwise healthy females. OCs drugs accentuate the gingival response to local irritants similar to that seen in pregnancy. The incidence and severity of gingival disease are positively correlated with plasma sex hormone concentration and duration of use. The long term use of OCs increased gingival inflammation, gingival enlargement and clinical attachment

loss. In contrast; a clinical study was unable to demonstrate any effect of low dose OCs on gingival tissue [4]. Human gingiva contains estrogen and progesterone receptor that influence the periodontal tissue to act as target organ for sex hormone. In most cases gingival enlargement was reversed when OCs was discontinued or dosage reduced [4]. Dry socket and dry mouth are also most common oral side effect of oral contraceptive .Dry socket is a very painful condition in which the socket left behind after the extraction does not heal. Women on oral contraceptive should inform the dentist about this before the treatment. Hence, women should be aware of these side effects [5]. Women oral health is important to enhance the quality of their life and the use of oral contraceptive pills can lead to oral and periodontal diseases, so to ensure better oral health women should have good knowledge and awareness about the effect of these drugs in the oral cavity. This study was conducted to assess women awareness about the side effects of using oral contraceptive, assess knowledge about the effect of contraceptive pills on the periodontal health and assess oral hygiene habits among women using contraceptive pills. This study will improve the knowledge of women at reproductive age about the oral and periodontal effect of OCs drugs and to enhance their dental care.

2. MATERIALS AND METHODS

We conducted a descriptive cross sectional study hospital base among women in reproductive age (18-50 years old) at the Military Hospital in Omdurman (Sudan) since December 2018 to March 2019. Women who used oral contraceptive drugs for more than six months were represented as study participants. We excluded the women who didn't have regular followed up with the hospital; women had systemic diseases and those who used other drugs that may affect the oral and periodontal tissue. Sample size was estimated based on this equation; $N = Z^2pq/n2$. Therefore, 205 participants were accessed to achieve 95% confidence interval and 5% margin of error. A convenience sampling method was

used to selected study participants who met the inclusion criteria during the study period. Participants who were available during the data collection were included in the study. A designed pre testing and revised self administered questionnaire was used to collect data from study participants. We collected demographic variable such as age, educational level. Awareness about contraceptive drugs, data included the effect of this drug on oral and periodontal tissue health and the oral hygiene practice. Collected data was entered into the SPSS software (version 23). Data was analyzed with same software and results presented as frequencies and proportions in table and figures. Difference between two proportions was used for the oral and periodontal symptoms that women had with OC drugs.

3. RESULTS

A total number of 205 women at reproductive age were included in this study with the mean of age 31 ± 7.42 yearsold as shown in Table 1. Out of the total, 174 (85%) women used OC for more than one year as found in Fig. 1. A number of 111 (54%) of study participants had university educational level as seen in Fig. 2. Of the total, 143(69.7%) of women at reproductive age complained of gingival and oral ulcer (p-vale <0.01), 25(12%) complained from gingival bleeding (p-vale <0.01), 23 (11 %) gingival redness, enlargement (p-vale <0.01), and only 6 (3%) complained of tooth mobility during the use of oral contraceptive drugs (p-vale <0.01) with statistical significant difference (Table 2). Regarding oral hygiene habits, 109 (53.2 %) of women at reproductive age brushed their teeth twice per day, and 189 (92%) of them used floriated tooth paste as demonstrated in Table 3. Most of participants, 166 (81%) changed their tooth brushes every 3 months as seen in Table 3. The results of this study showed that 158 (77%) of the women did not get scaling after start using OC drugs as mentioned in Table 3. Almost 91% of the women were not aware about the effect of OC drugs on oral and periodontal health as seen in Fig. 3.

Table 1. The age of the women who used oral CO drugs

Age	Means± (SD)
(18-45)	31.2 ± 7.42

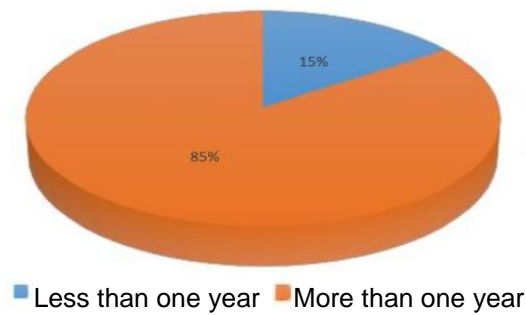


Fig. 1. The duration of using OC drugs

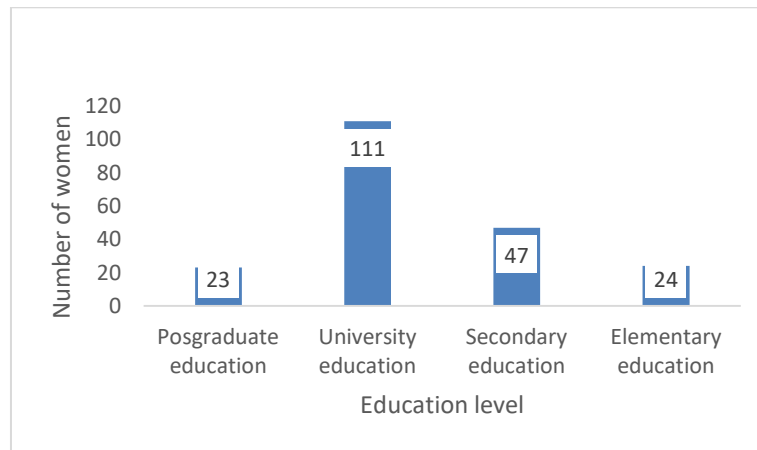


Fig. 2. The education level of the participant's women

Table 2. The oral and periodontal symptoms that women had with OC drugs

Oral and periodontal symptoms	Yes Frequency(205) 100%	No Frequency(205) 100%	P- value
Gingival bleeding	25 (12%)	180 (88%)	<0.01
Gingival redness	23 (11%)	182(89%)	<0.01
Gingival and oral ulcer	143 (69.7%)	62(30.3%)	<0.01
Gingival Enlargement	23 (11%)	182 (89%)	<0.01
Tooth mobility	6 (3%)	199 (97%)	<0.01

Table 3. Oral hygiene practice and professional scaling visits during the period Of OCs drugs used

Oral hygiene practice Variables	Frequency (N=205) percent (100%)
Frequency of teeth brushing per day	(Frequency) %
Once	74 (36.1%)
Twice	109 (53.2%)
Triple	22 (10.7%)
Type of tooth paste	Frequency %
Fluoridated tooth paste	189 (92%)
Non Fluoridated tooth paste	16 (8%)
The time for changing tooth brush	Frequency %
Three month	166 (81%)
More than three month	39 (19%)
Professional scaling visits	Frequency %
Yes	47 (23%)
No	158 (77%)

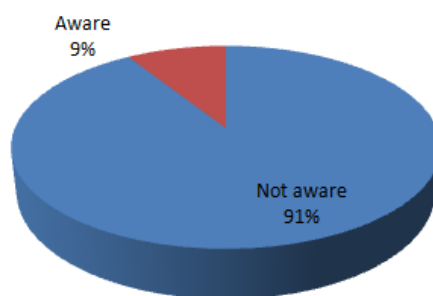


Fig. 3. Awareness about the relation between OCs drugs and oral health

4. DISCUSSION

Oral contraceptive drugs are one of the most common used class of drugs by women's for birth control and as results of their wide distribution, many systemic and oral side effects have been identified according to the dose and duration of the drugs [4]. The oral and periodontal adverse effects of the elevation ovarian hormones include the aggravated of the gingival response to local factors like plaque and increase gingival inflammation and enlargement, periodontal destruction and oral disease progression [4,6].

Oral contraceptive drugs have effect on gingival microvasculature by induce vascular permeability and it has been shown that the gingival tissue contain receptors for estrogen and progesterone hormone which may assisted in the progress of the inflammation and the continuous exposure of OC pills increase the production of pro inflammatory cytokines and prostaglandin, both estrogen and progesterone decrease the gingival immune response to plaque bacteria that increase the risk of periodontal tissue destruction and loss of attachment [1,4,7,8].

The results showed that the 31 years old was the mean age of the women who majority of them were had the university education and 85% started using OC pills for more than 1 year. Although most of women have high level of education, (91%) of them were not aware about the effect of OC drugs in oral and periodontal health.

Most women in this study (88%) didn't have gingival bleeding; this may be due to the women good oral hygiene. Our finding was agreed with the Study conducted by Taichamn et al which showed that OC user had mild gingivitis [9]. On the other hand, there were studies demonstrated an increased risk of gingival diseases in OC user which reflected by increased in the gingival index

score and gingival bleeding because estrogen increase the quantity of inflammation in gingival tissue and progesterone increase vascular dilation, blood flow to the gingival tissue and vascular permeability [10,11,12]. Mullallay et al showed that women taking contraceptive pills have more sever gingival bleeding and periodontal attachment loss [13]. Study was done by Kardalkar et al demonstrated 42% of women who used OCs drugs had complained of bleeding gums in the last six months [14].

In our study majority of women brushed their teeth twice times /day and used fluoridated tooth paste which suggest an acceptable oral hygiene habits.

We found that 77% of women didn't get scaling after start using OC drugs, this may be result from that the effect of the OC drugs were not noticeable due to their good oral hygiene habits and the low awareness regarding the relation between the OC drugs and periodontal diseases. in our study most of the participants used contraceptives pills for more than one year .The increase in gingival inflammation is usually related to the duration of use, and results of studies suggest that prolonged use of oral contraceptives drugs may detrimentally affect the periodontium and women who receiving OC drugs for more than one and half year to two year may exhibited grater periodontal destruction due to alter host resistance after long term hormone in take [3,8]. The use of hormonal contra captive drugs is associated with increase the severity of periodontal diseases that may extend to attachment loss and periodontitis [15].

In the present study most of the women didn't have gingival enlargement which may be related to their oral hygiene habits, this result was agreed with Mullally et al in who reported that the negative influence of the changes in estrogen and progesterone levels can be controlled by additional plaque control [13]. Our result

regarding the gingival enlargement is not in agreement with the study conducted by Mahajan and sood who documented the gingival enlargement and bleeding in 32 years old female used contraceptive drugs for more than two years and had poor oral hygiene [16]. The gingivitis and gingival enlargement in oral contraceptive users can be minimized by establishing low plaque levels by good control during or at the beginning of the therapy [16].

The majority of women in our study complained of Gingival and oral ulcer, and this result was in agreement with French study done by bursztien et al who conducted that aphthosis (oral apthous ulcer) was one of oral lesions that associated with oral contra captive pills and regress rapidly in (1-5 weeks) a after stopping the pills [17]. Also the result was in accordance with Kardalkar et al who reported that 23% of women Complained of burning mucosa, sensitivity and ulcers [14].

5. CONCLUSION

Most of females who use the OC drugs were not aware about its effect in the oral and periodontal health .Most of users focus on brushing and its tools, way and frequency more than periodic inspection in dental clinic and majority of them complained from oral ulceration.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Mistry S, Bhowmick D. Oral contraceptive pill induced periodontal endocrinopathies and its management: A case report. *European Journal of Dentistry*. 2016;6:324-328.
2. Loe H, Theilade E, Jensn SB. Experimental gingivitis in man. *J Periodontol*. 1965; 36:177-87.
3. Nandini DB, Deepak BS, Sanjeeta NG, Banerjee S, Devi A, Premlata T. Oral contraceptive and oral health: an insight. *International Journal of Medical and Dental Sciences*. 2016;5(2):1297-303.
4. Prachi S, Jitender S, Rahul C, Jitender K, Priyanka M, Disha S. Impact of oral contraceptive on periodontal health. *Afr. Health Sci*. 2019; 19(1):1795-1800.
5. Manasa A, Prasanna J, Karunakar P. Detrimental consequences of women life cycle on the oral cavity. *J Oral Res*. 2018;10:39-44.
6. Klokkevold PR, Mealey BL. Influence of systemic disorders and stress on the periodontium. In: Newman MG, Takei HH, Klokkevold PR, Carranza FA. *Clinical Periodontology*. 10th edition. China. Elsevier. 2007;284-307.
7. Mealey L, Moritz J. Hormonal influences on periodontium. *Periodontol*. 2003; 32:59-81.
8. Mohamed LJ .Influence of oral contraceptive pills on periodontal disease. *Med J B abylon*. 2019;16:367-8
9. Taichman LS, Eklud SA. Oral contraceptives and periodontal diseases: rethinking the association based upon analysis of National Health and Nutrition Examination Survey data. *J Periodontol*. 2005; 1374-1375.
10. Samdi L, Zakaryia A. The association between the use of new oral contraceptive pills and periodontal health: A matched case control study. *J Int Oral Health*. 2018; 10:127-31.
11. Sambashivaiah S, Rebentish PD, Kulal R, Bilichodmath S. The influence of oral contraceptive on the periodontium. *J Health Sci*. 2010; 1:1.
12. Al-Saffar MT. The effects of contraceptive pills on oral health: A review study. *Acta Scientific Dental Sciences*. 2019;3(12):61-64.
13. Mullally BH, Coulter WA, Hutchinson JD, Clarke HA. Current oral contraceptive status and periodontitis in young adults. *J Periodontol*. 2007; 78:1031-6.
14. Kardalkar S, Bhayya H, Kardalkar S. Assessment of knowledge, attitude and oral health status of the women using oral contraceptive pills among different socioeconomic status. *Saudi J Oral Dent Res*. 2019;4(1):25-30.
15. Castro MML, Ferreira MKM, Prazeres IEE, Nunes PBO, Magno MB, Rosing, Maia LC, Lima RR. Is the use of contraceptives associated with periodontal diseases? A systematic review and meta analyses. *BMC Women's Health*. 2021; 21(48):1-22.

16. Mahajan A, Sood R. Oral contraceptives induced gingival overgrowth-A clinical case report. *POJ Dent Oral Care.* 2017;1(1):1-5.
17. Bursztein FC. The effect of oral contraceptives on the mouth mucosa. *Acta Stomatol Belg.*1974; 71(1):119-24.

© 2023 El Seed et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

*The peer review history for this paper can be accessed here:
<https://www.sdiarticle5.com/review-history/99644>*