

Effects of Oral Contraceptives Intake On the Gingiva

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ABSTRACT:

BACKGROUND:

The use of contraceptive medication has been shown to increase gingival inflammatory reaction to local irritants.

OBJECTIVE:

To determine the effect of oral contraceptive pills and the duration of drug intake on the plaque index, gingival index and probing depth.

METHODS:

A total of 30 women of the age group 19-40 years attending a primary health care center in AL-Ramadi city were selected and permitted to start taking contraceptive pills. Three visits were arranged of three months interval between the visits. Plaque index, gingival index & probing depth were measured at the three visits.

RESULTS:

The results revealed a significant difference in the mean plaque index & the mean gingival index among the three visits. Regarding the probing depth, 23.3% of women had pocket depth of 4 & 5mm and this percentage was the same for the three visits.

CONCLUSION:

Results indicates that women taking contraceptive pills had increasing mean of plaque & gingival indices with increasing the duration of drug intake. Probing depth was found the same through the three visits.

KEYWORDS: periodontal disease, contraceptive pills.

INTRODUCTION:

As females go through certain stages in their reproductive life cycle, alterations arise in the level of sex hormones which affect females starting from puberty, peaking in pregnancy and persisting up to and even after menopause⁽¹⁾.

Variations in the levels of progesterone and estrogen in women may adversely affect the periodontal tissues in the mouth. The elevated level of these hormones causes an exaggerated response of the gingival tissue to the dental plaque⁽²⁾. The most common oral manifestation of elevated levels of ovarian hormones is an increase in gingival inflammation with an accompanying increase in gingival exudate⁽³⁾.

An increased progesterone levels are associated with alteration in the existing microbial populations. The level of prevotella intermedia increase because of the high concentration of the hormones available as a nutrient for growth⁽⁴⁾. Also it has been found that increased estrogen level can

induce and stimulate the proliferation of gingival fibroblasts⁽⁵⁾.

One of the important parameters that families need to be put under control is the number of children and time of pregnancies. Smaller families and longer birth intervals have contributed to the better health of infants, children and women⁽⁶⁾.

Contraception and reproductive health-care systems had improved couples ability to plan their families⁽⁷⁾. The use of oral contraceptives has become wide spread and it has been reported that high dose of combined oral contraceptive pills (containing >50mg of estrogen and >1 mg progesterin) places women at increased risk for developing periodontal diseases⁽⁸⁾.

Many studies have shown there was a statistically significant increase in the gingival inflammation related to the duration of the drug therapy and the gingival inflammation was significantly more severe in the women taking oral contraceptives than in the control group^(9,10).

The purpose of the present study was to determine the effect of oral contraceptive pills on the plaque index, gingival index and probing depth. Also to determine the effect of the duration of the use of these drugs on the previous parameters among women ages 19-40 years in the center of AL-Ramadi city, AL-Anbar Govern orate-Iraq.

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MATERIALS AND METHODS :

Thirty women attending AL-Andalus primary health care center in AL-Ramadi city were selected to participate in this investigation. Those women were not on oral contraceptive pills for at least 6 months. Three visits had been arranged. The first visit was dated at the 1st. of May 2004, at this visit plaque index (PII), gingival index (GI) and probing depth were measured and women of the sample were all permitted to start taking the contraceptives. The second and third visits were dated at the 31st. of July 2004 and the 31st. of October 2004. At each of the remaining two visits, PII, GI & probing depth were measured again. Oral examination was performed in a dental clinic. The assessment of dental plaque was made according to plaque index of Sillness & Loe (1964)⁽¹¹⁾. Gingival condition was measured according to gingival index of Loe & Sillness (1963)⁽¹²⁾, while the probing depth was measured using William's periodontal probe from the gingival margin to the most apical extent of the probe. A scale of three grades has been designed to code the probing depths score according to the following criteria:-

Grade 0= 0-3mm probing depth

Grade 1= 4-5mm probing depth

Grade 2= 6mm and more probing depth

One way analysis of variance was used where indicated, level of significance was 0.05.

RESULTS:

Table (1) shows the frequency distribution of the sample according to age. Approximately 90% of the women fall in the age range 23-36 years.

Table (2) shows the mean and SD. of the PII for the three visits for each women. The mean PII vary from visit to another and to test this variability, one way analysis of variance has been used as it is shown in table(3). It is obvious from the statistic F & its P-value that there was a significant difference between mean PII among the three visits.

Figure (1) shows the box plots of plaque means by visits one, two & three which indicates the gradual accumulation of plaque over time.

Table (4) shows the mean & SD of the GI calculated for the three visits for each women involved in this research work. The one way analysis of variance has been used to see wither or

not, the increase of the GI among visits was resulting in a significant change. The results of this test are shown in table (5). The F statistics and it's associated P-value indicated that there was a significant change in the mean GI. Among the three visits.

Figure (2) shows the box plots of GI means by visits one, two & three which indicates the gradual increase in the gingival inflammation over time.

Figure (3) shows the distribution of women according to the grades of the probing depth. It shows that 23.33% of women had probing depth of grade 1 which is 4-5mm depth. While 76.67% of women had no pockets (grade 0). It is obvious that the percentages of women with grade 1 pocket depth were the same at each visit.

DISCUSSION:

The effect of oral contraceptives on women's oral health has been the concern of many authors^(13,14,15). In this investigation, it was found that the mean plaque index for all women was significantly increasing by time due to the use of oral contraceptive pills. It is obvious that as the time of using the oral contraceptive pills extended, the mean plaque index will be increase and this may be attributed to the hormonal fluctuations caused by using the hormonal contraceptives⁽¹³⁾. The mean plaque index calculated in our study was found to be in agreement with Pre shaw et al⁽¹⁶⁾ but it was less than that found by Salameh⁽¹⁷⁾ in which the women use the contraceptives for a longer period than our study. Regarding the GI, it was found that the change in the gingival index overtime is greater than that of the mean plaque index. The mean GI in this study was found less than other studies^(9, 17) and this could be attributed to the time of oral contraceptives intake which is shorter in this study. The mean GI was found in agreement with the study done by Pre Shaw⁽¹⁶⁾. The percentages of women with pocket depth grade 1 was found 23.3% and this result was the same for the three visits. and it was lower than that of other study⁽⁹⁾, and this may be attributed to the ages of women who participated in this study which range between 19-40 years which is lower than the age range of the previous study.

Table 1: Frequency distribution of the sample according to age.

Age group	Frequency	Relative frequency
19- 20	2	6.67
21-22	0	0
23-24	3	10
25-26	7	23.33
27-28	3	10
29-30	5	16.67
31-32	4	13.33
33-34	2	6.67
35-36	3	10
37-38	0	0
39-40	1	3.33
Total	30	100

Table 2: Means and standard deviations of the plaque index for three visits for each patient.

Patients	Visit 1	Visit 2	Visit 3
	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
1	1.39815 $\pm$ 0.348481	1.4444 $\pm$ 0.342034	1.83333 $\pm$ 0.268543
2	1.25000 $\pm$ 0.263523	1.030357 $\pm$ 0.306995	1.32143 $\pm$ 0.270948
3	0.25000 $\pm$ 0.346109	1.30000 $\pm$ 0.367990	1.35000 $\pm$ 0.306186
4	1.33929 $\pm$ 0.327832	1.36607 $\pm$ 0.350146	1.41071 $\pm$ 0.348371
5	1.22321 $\pm$ 0.184332	1.28571 $\pm$ 0.251976	1.33036 $\pm$ 0.297003
6	1.26786 $\pm$ 0.203313	1.26786 $\pm$ 0.151054	1.31250 $\pm$ 0.161374
7	1.23214 $\pm$ 0.203313	1.26786 $\pm$ 0.151054	1.22321 $\pm$ 0.218785
8	1.25926 $\pm$ 0.224481	1.23214 $\pm$ 0.224934	1.22222 $\pm$ 0.222889
9	1.35577 $\pm$ 0.317593	1.25926 $\pm$ 0.213504	1.49038 $\pm$ 0.402924
10	1.23214 $\pm$ 0.191589	1.46154 $\pm$ 0.385307	1.25000 $\pm$ 0.263523
11	1.50962 $\pm$ 0.295641	1.25893 $\pm$ 0.249835	1.70192 $\pm$ 0.234726
12	1.16964 $\pm$ 0.193093	1.21429 $\pm$ 0.212070	1.29464 $\pm$ 0.226217
13	1.37500 $\pm$ 0.259094	1.31250 $\pm$ 0.241762	1.35714 $\pm$ 0.28455
14	1.33929 $\pm$ 0.282304	1.31250 $\pm$ 0.301424	1.35714 $\pm$ 0.299912
15	1.36607 $\pm$ 0.267725	1.47321 $\pm$ 0.257654	1.40179 $\pm$ 0.275036
16	1.41667 $\pm$ 0.353553	1.44444 $\pm$ 0.327676	1.40741 $\pm$ 0.318863
17	1.30357 $\pm$ 0.266642	1.36607 $\pm$ 0.276236	1.41964 $\pm$ 0.272621
18	1.30357 $\pm$ 0.248674	1.33036 $\pm$ 0.263993	1.38393 $\pm$ 0.230560
19	1.29464 $\pm$ 0.226217	1.34821 $\pm$ 0.218785	1.33929 $\pm$ 0.227855
20	1.26852 $\pm$ 0.258750	1.28704 $\pm$ 0.192450	1.35185 $\pm$ 0.252481
21	1.22222 $\pm$ 0.160128	1.17593 $\pm$ 0.167200	1.25000 $\pm$ 0.229967
22	1.32143 $\pm$ 0.262265	1.25000 $\pm$ 0.254588	1.30357 $\pm$ 0.248674
23	1.18750 $\pm$ 0.211093	1.25000 $\pm$ 0.235702	1.31250 $\pm$ 0.221788
24	1.15179 $\pm$ 0.184332	1.19643 $\pm$ 0.229302	1.30357 $\pm$ 0.275186
25	1.25000 $\pm$ 0.254951	1.28246 $\pm$ 0.241788	1.30769 $\pm$ 0.257951
26	1.28000 $\pm$ 0.300347	1.36000 $\pm$ 0.270801	1.47000 $\pm$ 0.273099
27	1.36000 $\pm$ 0.250832	1.48000 $\pm$ 0.269258	1.55000 $\pm$ 0.260208
28	1.37500 $\pm$ 0.292657	1.45536 $\pm$ 0.236228	1.41071 $\pm$ 0.273982
29	1.33929 $\pm$ 0.273982	1.36607 $\pm$ 0.276236	1.38393 $\pm$ 0.284492
30	1.29464 $\pm$ 0.215741	1.39286 $\pm$ 0.2584555	1.51786 $\pm$ 0.339721

Table 3: Analysis of variance for means of plaque index.

Source of variation	DF	SS	MS	F	P
Between visits	2	0.1163	0.0582	5.29	0.007
Error	87	0.9573	0.0110		
Total	89	1.0736			

Visits	N	Mean	SD
1	30	1.2979	0.0785
2	30	1.3353	0.0966
3	30	1.3856	0.1323

Table 4: Means and standard deviation of the gingival index for the three visits for each patient.

Patients	Visit 1	Visit 2	Visit 3
	Mean $\pm$	Mean $\pm$	Mean $\pm$
1	1.44643 $\pm$ 0.157485	1.76786 $\pm$ 0.203313	2.14286 $\pm$ 0.143187
2	1.25893 $\pm$ 0.186117	1.41071 $\pm$ 0.206540	1.51786 $\pm$ 0.203313
3	1.24107 $\pm$ 0.267725	1.47321 $\pm$ 0.239011	1.72321 $\pm$ 0.229122
4	1.32143 $\pm$ 0.202498	1.57143 $\pm$ 0.202498	1.67857 $\pm$ 0.224198
5	1.26786 $\pm$ 0.116440	1.39286 $\pm$ 0.172516	1.53571 $\pm$ 0.212070
6	1.2129 $\pm$ 0.212070	1.30357 $\pm$ 0.157485	1.36607 $\pm$ 0.173234
7	1.23214 $\pm$ 0.165672	1.37500 $\pm$ 0.144338	1.48214 $\pm$ 0.165672
8	1.26786 $\pm$ 0.191589	1.40179 $\pm$ 0.171314	1.47321 $\pm$ 0.141737
9	1.34821 $\pm$ 0.229122	1.55357 $\pm$ 0.321722	1.76786 $\pm$ 0.271557
10	1.26786 $\pm$ 0.116440	1.46429 $\pm$ 0.162650	1.62500 $\pm$ 0.209718
11	1.46429 $\pm$ 0.345033	1.65179 $\pm$ 0.335681	1.86607 $\pm$ 0.258934
12	1.25000 $\pm$ 0.152145	1.49107 $\pm$ 0.159312	1.60714 $\pm$ 0.172516
13	1.36607 $\pm$ 0.284492	1.33036 $\pm$ 0.280983	1.41964 $\pm$ 0.304698
14	1.38393 $\pm$ 0.284492	1.44643 $\pm$ 0.239184	1.45536 $\pm$ 0.245832
15	1.28571 $\pm$ 0.251976	1.41071 $\pm$ 0.298253	1.45536 $\pm$ 0.289104
16	1.23214 $\pm$ 0.165672	1.33929 $\pm$ 0.182755	1.43750 $\pm$ 0.161374
17	1.29464 $\pm$ 0.245832	1.37500 $\pm$ 0.230740	1.53571 $\pm$ 0.200858
18	1.33036 $\pm$ 0.289104	1.41964 $\pm$ 0.272621	1.53571 $\pm$ 0.251976
19	1.33929 $\pm$ 0.282304	1.38393 $\pm$ 0.267725	1.33929 $\pm$ 0.237797
20	1.24107 $\pm$ 0.220292	1.31250 $\pm$ 0.211093	1.41071 $\pm$ 0.217459
21	1.25893 $\pm$ 0.159312	1.49107 $\pm$ 0.249835	1.62500 $\pm$ 0.250000
22	1.37500 $\pm$ 0.267879	1.23214 $\pm$ 0.203313	1.33036 $\pm$ 0.236228
23	1.29464 $\pm$ 0.245832	1.46429 $\pm$ 0.222718	1.67857 $\pm$ 0.190724
24	1.2321 $\pm$ 0.116440	1.35714 $\pm$ 0.230022	1.66071 $\pm$ 0.195011
25	1.31250 $\pm$ 0.199826	1.39286 $\pm$ 0.185450	1.36607 $\pm$ 0.249835
26	1.24107 $\pm$ 0.159312	1.39286 $\pm$ 0.172516	1.53571 $\pm$ 0.212070
27	1.30357 $\pm$ 0.184556	1.56250 $\pm$ 0.175132	1.75893 $\pm$ 0.159312
28	1.34821 $\pm$ 0.266487	1.38393 $\pm$ 0.220292	1.37500 $\pm$ 0.240563
29	1.35714 $\pm$ 0.284056	1.50893 $\pm$ 0.220292	1.58036 $\pm$ 0.204731
30	1.30357 $\pm$ 0.248674	1.58036 $\pm$ 0.312202	1.88393 $\pm$ 0.258934

Table 5: Analysis of variance of means of gingival index.

Source of variation	DF	SS	MS	F	P
Between visits	2	1.0909	0.5455	32.09	0.00001
Error	87	1.4787	0.0170		
Total	89	2.5696			

Visits	N	Mean	SD
1	30	1.3027	0.0635
2	30	1.4414	0.1117
3	30	1.5723	0.1857

Pooled SD = 0.1304

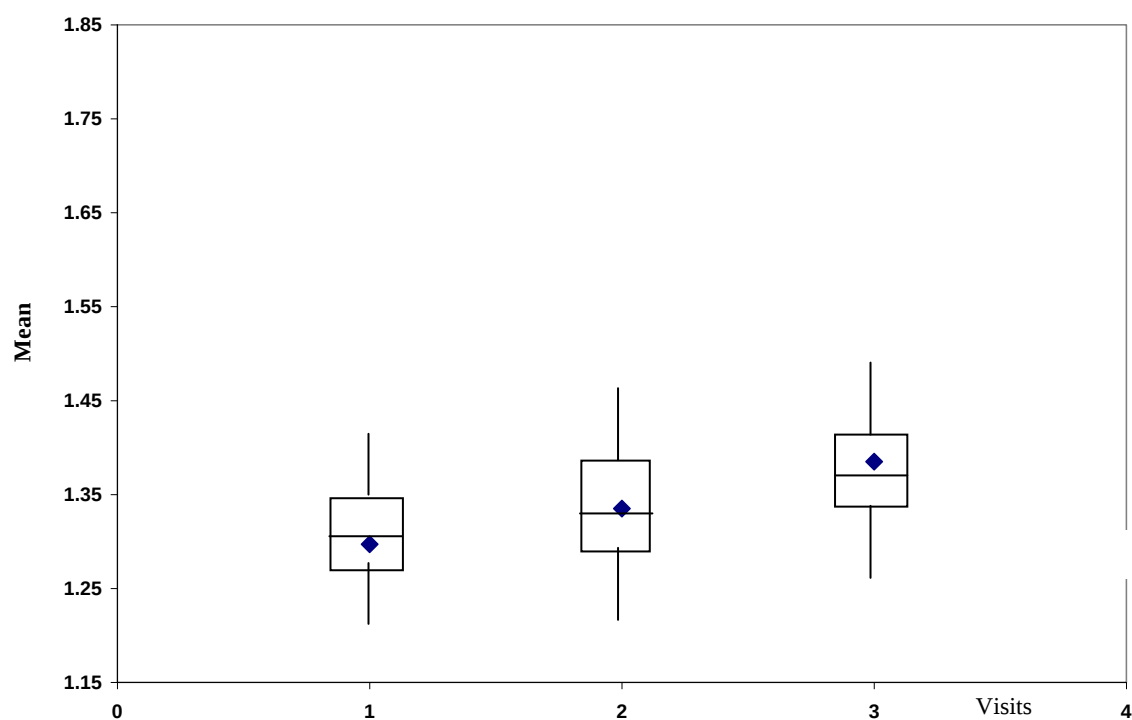


Figure 1: Box plots of plaque means by visits (Means are indicated by solid circles).

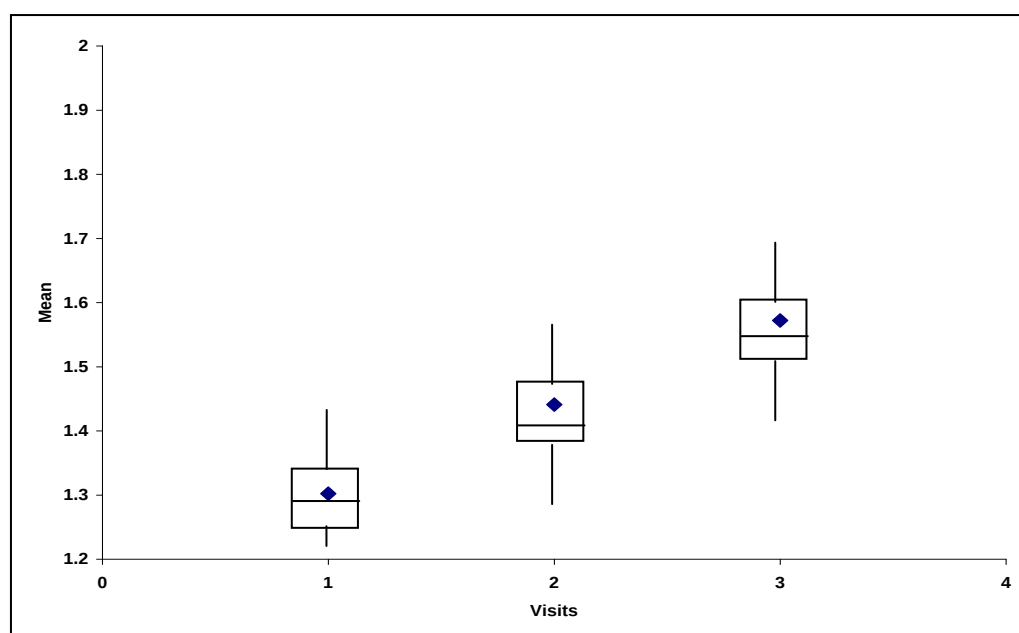


Figure 2: Box plots of GI. Means by visits (Means are indicated by solid circles).

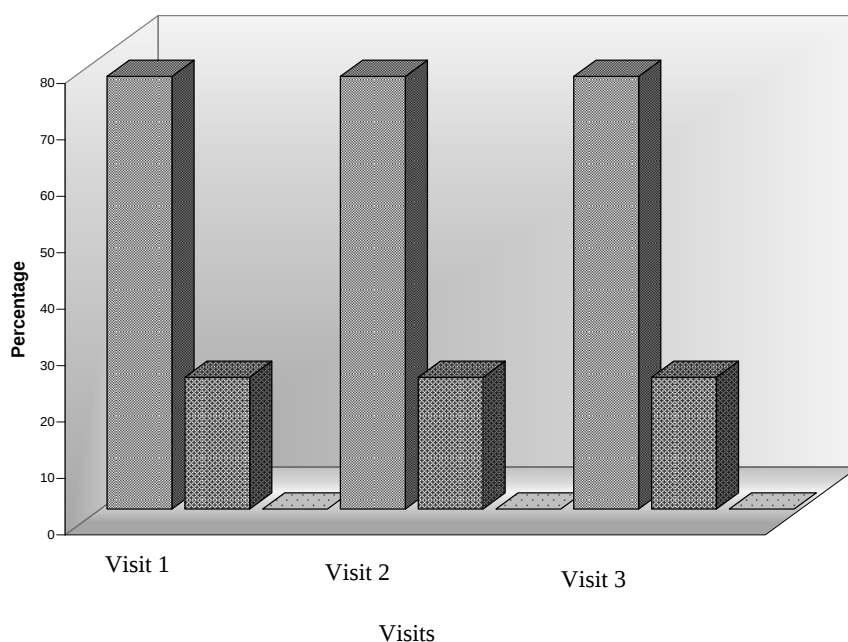


Figure 3: Bar chart of the percentages of women with respect to the grades of probing depth for each visit.

CONCLUSION:

Plaque and gingival indices were found to be accumulated overtime with the use of contraceptive pills. Also it was found that the increment of the mean gingival index over time was greater than that of mean plaque index and there was no change in the probing depth for the three visits.

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