A comparative study in periodontal status between pregnancy women and single females in Mosul city, Iraq.

Tarik Y. Khamrco BDS, DDPH (RCS), M.Sc.*
Khawla M Saleh B.D.S, M.Sc.**

Abstract:

The purpose of the study to evaluate the periodontal status (oral hygiene and gingival health) in pregnant women and compare it with single females in Mosul city.

A total sample of (666) females (399 pregnant women and 267 single females) selected randomly, their age range was (18-39) years. The assessment of gingival health condition and oral hygiene was performed using gingival index by (Löe and Silness), plaque index by (Silness and Löe) and calculus index by (Bjorby and Löe).

The study showed that there were high significant differences in mean of gingival, plaque and calculus indices between the pregnant and single females, except for the age group (18-24) years for calculus index.

The results of study revealed no significant difference between age groups of pregnant women and for single females. Also the study demonstrated no significant difference between age groups of single females in the mean plaque index, while there is an increase in mean plaque score with the age for pregnant women.

The study indicated that there was a significant increase in mean calculus index with the age significantly, while the mean in single females increase slightly with the age, and only the younger age group (18-24) years reported a lower significant mean than the older age groups (30-34 and 35-39) years.

Key words:

Periodontal status, gingival health, oral hygiene, plaque index, calculus, pregnant women, single females.

* Professor in Community Dentistry, Dean College of Dentistry, Al-Mustansiria University
** Assistant lecturer in the Department of Periodontics, Orthodontics and Preventive Dentistry, College of Dentistry, University of Mosul.

Introduction:

Oral environment could show certain changes in women. In regard to the genetic and hormonal differences existing between women and men, these alterations could reflect the probable hormonal influences during life stages of women from childhood through adulthood including menstruation, pregnancy, menopause and the post-menopause period [1].

There are many myths about dental health and pregnancy. Although there are a lot to think about, during this time, oral health is important during pregnancy and should not be neglected. Therefore, pregnant women may be considered as patients with temporary but higher than normal risk of developing periodontal complication [2].

Oral physiological changes were seen during pregnancy including gingival inflammation, hypertrophy, epulis and caries [3-7], while the relationship to loss of periodontal attachment as an unequivocal cause and affect remain unclear [8].

Since the first recorded pregnancy associated gingivitis, clinical investigations revealed that the gingival condition in pregnant women should be considered a separate problem from simple gingivitis [9]. Hence, this change in the gingival tissue during this period is termed as (pregnancy gingivitis). The gingival may appear hyperemic and enlarged and bleeding may be frequent during brushing or on external manipulation [10-14].

The clinical picture may vary from a localized inflammation of the gingival margin, particularly about the anterior teeth to a generalized involvement of the interdental papillae and of the free gingival margin and occasionally the swelling of the individual papillae may be extensive to develop a pregnancy tumor [15-18].

In Iraq, there are no many longitudinal and cross-sectional studies concerning dental health (periodontal disease and dental caries) in pregnancy and no information concerning dental health knowledge, attitude and behavior of pregnant women. It is of importance to achieve them in order to plane a preventive program to such a community.

So it is decided to carry out a study to evaluate the periodontal status (oral hygiene and gingival health) in pregnant women and compare it with single females in Mosul city.

Materials and methods:

A total sample of (666) females (399 pregnant women and 267 single females) selected randomly, their age range was (18-39) years. The pregnant women attending to the Maternal and Child Health Care Center (MCHCC) for their monthly periodic checkup, with different pregnancy stages.

From the total 16 MCHCC, four MCHCC were selected randomly to

examine the pregnant women while the single females examined when attending the health centers.

The examination was performed in a suitable room under standardized condition following the recommendation of WHO (1997). Subjects were examined by seating on a portable chair fixed with an adjustable head rest.

The assessment of gingival health condition and oral hygiene was performed using the following clinical parameters...

1- Gingival index system (GI) by (Löe and Silness) [15] to assess gingival inflammation.
2- Plaque index system (PI) by (Silness and Löe) [10] to assess the oral hygiene.
3- Calculus index system (Cal I) by (Bjorby and Loe) [18] to assess the calculus accumulation.

The index teeth selected for the assessment of this index were six teeth representing the six segments of the jaw (Ramfjord 1959), four surfaces in each index tooth were examined (buccal, lingual, mesial, and distal).

The statistical analysis of the data includes, the classification of data and calculation of the mean and standard deviation, F-test has been used to determine the significant differences in the mean plaque, gingival and calculus scores between pregnant and single females according to age and for total sample, and one way analysis of variance (ANOVA) and Duncan's multiple range test have been used to compare the differences among the groups (age group) (pregnant and single female) for GI, PI and Cal I.

Results:

Table (1) shows the distribution of the sample according to the age group in pregnant women and single females.

Table (1): Distribution of the Sample by Age Groups.

Age	Pregnant Women		Single Females	
	No.	%	No.	%
18-24	99	24.80	90	33.10
25-29	103	25.80	67	25.10
30-34	97	24.30	68	25.50
35-39	100	25.10	42	15.70
Total	399	100.00	267	100.00

Table (2) illustrates the mean GI for pregnant and single females by age. The study revealed no significant difference between age groups of pregnant woman in the mean of GI, but there is slightly increased with the age as well as the same results found between age groups of single females.

When compare between two main groups (pregnant and single females). It was showed that there were high significant differences in mean of GI in all age groups and for total sample, it was (1.91 and 1.07 for both pregnant and single groups, respectively).

Table (2): Differences in the Mean Gingival Index (GI) Scores between Pregnant and Single Females According to Age Group.

Age Group	Pregnant Women	Single Females	Z-test	*P*	Significance
	GI (Mean ± SD)	GI (Mean ± SD)			
18-24	1.85± 0.40^{A}	1.09± 0.47^{A}	9.17	< 0.000	S
25-29	1.91± 0.45^{A}	1.05± 0.41^{A}	9.05	<0.001	S
30-34	1.93± 0.32^{A}	1.07± 0.39^{A}	9.73	<0.001	S
35-39	1.95± 0.42^{A}	1.03± 0.41^{A}	8.18	<0.001	S
Total	1.91± 0.40	1.07± 0.43	8.25	<0.001	S

Groups with the same letter are not different significantly from each other.

The differences in the mean PI between pregnant and single females according to age group it shows in Table (3). The study demonstrated no significant difference between age groups of single females in the mean of PI, but there is an increase in mean of PI score with the age for pregnant women and there are significant differences between young age group (18-24) years and the elder age group (35-39) years.

The difference in mean PI between pregnant and single females shows a high significant difference in all age groups. As well as in total sample, there are high significant differences where the mean of PI of pregnant women was (1.40) and for single females was (1.05).

Table (3): Differences in the Mean Plaque Index (Pl I) Scores between Pregnant and Single Females According to Age Group.

Age Group	Pregnant Women	Single Females	Z-test	*P*	Significance
	GI (Mean ± SD)	GI (Mean ± SD)			
18-24	1.33± 0.45^{A}	1.06± 0.39^{A}	4.23	< 0.001	S
25-29	1.37± 0.43^{AB}	1.00± 0.41^{A}	5.30	<0.001	S
30-34	1.41± 0.39^{AB}	1.08± 0.36^{A}	5.23	<0.001	S
35-39	1.48± 0.43^{B}	1.05± 0.44^{A}	4.96	<0.001	S
Total	1.40± 0.43	1.05± 0.44	10.04	<0.001	S

Sub-groups with the same letter are not different significantly from each other.

Table (4) shows the mean calculus index for pregnant and single females by age. The study indicated that there was a significant increase in mean calculus index with the age of pregnant women, while the mean in single females increase slightly with the age, and only the younger age group(18-24)year reported a lower significant mean than the other old group (30-34/and 35-39) years.

Table (4): Differences in the Mean Calculus Index (Cal I) Scores between Pregnant and Single Females According to Age Group.

Age Group	Pregnant Women	Single Females	Z-test	*P*	Significance
	GI (Mean ± SD)	GI (Mean ± SD)			
18-24	0.40± 0.31^{A}	0.32± 0.25^{A}	1.16	< 0.107	NS
25-29	0.57± 0.37^{B}	0.39± 0.29^{AB}	3.50	<0.001	S
30-34	0.64± 0.45^{B}	0.43± 0.28^{B}	2.88	<0.004	S
35-39	0.77± 0.47^{C}	0.46± 0.35^{B}	4.08	<0.001	S
Total	0.59± 0.42	0.39± 0.26	6.54	<0.001	S

Groups with the same letter are not different significantly from each other.

When comparing between pregnant and single females, it was showed that there is a high significant differences in all age groups except the young age group (18-24) years. The mean calculus index for total sample of pregnant women is higher (0.59) than the mean of single females (0.39) and there were high significant difference between them.

Discussion:

Six hundred and sixty six women were included with different age ranged from 18-39 years of age. The most frequent age group for pregnant women in the present study is (25-29) years old. This is in agreement with the sample selected in the study carried by Offenbacher et al [19] that representing (31%) of the pregnant sample and Machuca et al [20] when formed (36.9%).

The original gingival index by Löe and Silness [15] was used to detect the earliest visual signs of gingivitis. The GI can be used to assess the prevalence and severity of gingivitis.

Each of GI, PI and Cal I can be used on a whole or selected mouth basis (index teeth), so it decides to select the index teeth as they represent the whole mouth (Ramfjord teeth) for children as well as adults [20]. This consistent system provides validity, feasibility and flexibility. In addition; it coincides with the study objectives and provides satisfactory reproducibility.

A change in the gingival appearance has been documented during pregnancy period. This change is consistent with the clinical description of gingivitis.

All pregnant women in the present study complain from gingival inflammation. Also, all single females had gingivitis. This agrees with other studies carried out in Iraq [21-24]. The prevalence of gingivitis represents 100% of the total sample. This is in accordance with the findings of many studies that they found 100% of the examined women develop gingivitis [15,21,25].

Al-Guboory [23] found that 95.5% of pregnant women had gingivitis, while Ziskin et al [26] found less than 40% of pregnant women had gingivitis in their study and this agree with other studies [27-29], but other studies [30-32], found 50% of their subjects had gingivitis and there is no significant difference in the gingivitis in pregnant and non-pregnant women.

The study revealed that the mean GI value in pregnant women was higher than in single females in all age groups and for total sample and there is a significant difference between them. This is in agreement with other studies [21,32,34].The mean gingival score was similar in different age group for both the pregnant and single females plaque index was higher and significant difference in pregnant group than single females group. Also, it showed slight increase with advancing age group. This

related to inadequate tooth-brushing carried out by pregnant women during pregnancy or may be due to other causes such as gag reflex and don't accept tooth-paste especially during first trimester of pregnancy and along with pregnancy and changing in food habit and increase sugary food [35].

Also related to careless of pregnant women about dental health with increase number of their children and repeated pregnancy with increase the age. This agreed with a study carried out by Shay and Ship [36] who said that the aging process alone has little effect on the oral cavity. Also there is an agreement with Sulaiman's study [21]; but disagreed with Al-Guboory [23] who found negatively significant correlation between oral hygiene parameter (PI, GI and Cal I) and age of pregnant women.

The study showed that the mean value of Cal I score of pregnant women was higher than in the single female and it has a significant difference in all age groups and total sample except in younger one (18-24) years. This leads to the fact that the accumulation of plaque and oral debris and there is no frequently and accurately removed with tooth brushing and dental floss lead to accumulated and changes from non-mineral deposit to mineral one which when occurred difficult to remove by ordinarily tooth cleaning aids and can irritate the gingiva and increase the gingival inflammation.

This indicates that both mineralized and non-mineralized oral deposits elicited greater effect during pregnancy on the gingival health, this was agreed with other studies [21, 32], while disagree in the findings of other study [37], who found no significant variation in amount of calculus which was observed between pregnant and single females.

The study indicated no significant difference between age groups of single females in the mean PI, but there was an increase in the mean PI score with the age for pregnant women. When comparing between the two groups, there were a high significant difference in mean PI between pregnant and single females. This may be due that pregnant women do not brush their teeth regularly because of careless or busy gag reflex during pregnancy.

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