

Evaluation of oral health status among a group of pregnant women in Kirkuk City

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ABSTRACT

INTRODUCTION: Pregnancy is a natural process; it represents a particular systemic condition that is able to induce, because of hormonal fluctuations, manifestations of different parts of the oral cavity.

OBJECTIVE: This study was conducted to assess the oral health status among the pregnant women in comparison to non-pregnant women and to dental antenatal care visits among the pregnant women.

METHODS: In this cross-sectional study, the oral health status of a convenient sample of 300 pregnant women with an age range 19-39 years in their 3rd trimesters have been investigated and compared with 300 non-pregnant women matching with study group in age, attending the outpatient clinic of Azady teaching hospital and Kirkuk general hospital in Kirkuk city.

RESULTS: The mean value of dental caries, gingivitis, plaque, calculus and clinical pocket depth were found to be higher among pregnant compared to non-pregnant women with statistically significant difference ($P < 0.05$), while not significant difference was observed for DMFT ($P > 0.05$). Rate of dental ante-natal care visits among the pregnant women was 43.9%. Gingival index was less among pregnant women who had dental ante-natal care visits than that those with no care visits ($P = 0.02$).

CONCLUSION: It was concluded that oral health status of the pregnant women was poor and education programs about the importance of dental ante natal care visit during pregnancy are needed.

Key words: Pregnant. Non-pregnant. Dental caries. DANCV.

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INTRODUCTION

Women have special oral health needs and considerations that men do not have; hormonal fluctuations have a strong influence on the oral cavity. Puberty, menses, pregnancy and menopause influence women's oral health.¹ Pregnancy is a physiological process in which every organ system is altered to some degree including the oral environment.² Certain conditions may have an effect on gingival status and may aggravate preexisting disease, especially in persons with poor oral hygiene; pregnancy is one of these conditions.^{3,4}

During pregnancy, hormones alter immune responsiveness and inflammatory response mediators; this has been reported to cause oral problems, primarily gingivitis and periodontal infection, with the most frequent and greatest changes occurring in the gingival tissue.⁵

The most important objective of dental health care in pregnancy is to establish a healthy environment through adequate plaque control by brushing, flossing and professional prophylaxis including scaling, root planning and polishing.⁶

Knowing the extend of the problem among pregnant women is important to enable primary health care providers to educate those women and provide necessary dental care. This study is going to assess the oral health status of the pregnant women visiting dental antenatal care in two hospitals in Kirkuk comparing to age matched non-pregnant women.

METHODS

Setting and Study Design: A cross-sectional study was carried out at Azady Teaching Hospital, Kirkuk general hospital, Kirkuk, Iraq from

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Ethical Consideration: The approval was taken from the Iraqi Ministry of Health. Oral informed consent of all participants was taken from each participants after explaining the aims of the study. Data of all participants were kept confidential and only used for the purpose of this study.

Definition of the cases, inclusion and exclusion criteria: A total sample of 600 women, pregnant and non-pregnant, were included in this study. Group one has included 300 pregnant women in their 3rd trimester attending obstetrics and gynaecology outpatient clinic of the above-mentioned hospitals. Group two has included 300 non-pregnant women who were age matched, healthy women attending the outpatient clinics of medicine, surgery, and obstetrics and gynaecology accompanying their sick relatives. A minimum of 20 teeth excluding third molars had to be present in the oral cavity of participants in both groups was required for inclusion in the study. Woman, pregnant and non-pregnant, who had any systemic diseases or using any medications that affect hormones were excluded. Non-pregnant women who was using oral contraceptive were also excluded from the study.

Sampling: A convenient method of sampling was used,⁷ the sample size was estimated using the STATA 9 software, the following information was entered the program: Alpha =0.05, power =0.90, mean one ($\pm$ SD) =1.82 $\pm$ 0.501, mean two ($\pm$ SD) = 1.93 $\pm$ 0.238. The estimated sample was 268 for each group. For convenience, 300 women were collected for each group.

Questionnaire form: A questionnaire designed by the investigator was used for data collection; data was collected by the investigator by direct interview with the women prior the examination. The form has included the following Information: code number, age, dental ante-natal care visit (DANCV) and dental ante-natal care knowledge, attitudes and behaviour of pregnant women.

Dental caries by using DMFT and DMFS indices were diagnosed and recorded according to the criteria suggested by WHO 1987,⁸ clinical detection of caries was made using a disposable dental mouth mirror and dental explorer according to the basic method of the WHO 1997.⁹

Examination was carried out in a systematic manner from one tooth or tooth space to the other and ending with the lower second molar.

Dental plaque was recorded by Plaque index (PI) according to Sinless and L  e 1964,¹⁰ gingivitis was recorded by Gingival index (GI) according to L  e and Silness 1963,³ and calculus was diagnosed by Calculus index (Cal I) according to Ramfjord 1959.¹¹ Depth of clinical pocket was measured by Williams' periodontal probe of six Ramfjord teeth.

Dental plaque, gingival condition, calculus, and clinical pocket depth were searched of in the six index permanent teeth (teeth number 3,9,12,19,25,28) to represent the whole dentition according to Universal/National System for permanent dentition. The examination was started with the mesial, buccal, distal and lingual surfaces with disposable mouth mirror and disposable sharp dental explorer for dental plaque, gingival condition and calculus. For examination of clinical pocket depth, Williams periodontal probe was used. Any missing index tooth in any segment are not substituted by another one. In the clinical examination, the women were asked to sit on a portable chair, diagnosis of dental caries, plaque, gingivitis and calculus made with disposable dental mirror and explorer, while clinical periodontal pocket diagnosed with Williams periodontal probe under natural light. Dental explorer and periodontal probe were cleaned with cotton after each examination to remove any debris (food, blood) from them. Plaque examination has been done first followed by caries, gingivitis, calculus and periodontal pocket.

Statistic: Data were analysed using the Statistical Package for Social Sciences (SPSS, version 15). Student's t test was used to compare between two means, and the Analysis of Variance (ANOVA) was used to show whether the difference between more than two means is significant or not. Chi square test of association was used to compare between two proportions. Linear regression test was used to show the relation between two variables. A 'P' value of ≤ 0.05 was considered as statistically significant.

RESULTS

Table 1 illustrates the mean values and standard deviation for caries experience represented

Table 1: Mean of Oral Variables (DMFT, DMFS, PI, Cal I And GI) in pregnant and non-pregnant women.

Oral Variable	Pregnant		Non- Pregnant		P value
	Mean	SD	Mean	SD	
DMFS	18.07	9.97	16.87	9.24	0.128
DMFT	9.89	3.26	9.70	3.31	0.48
PI	1.98	0.43	1.74	0.42	< 0.001
GI	2.39	0.49	2.08	1.05	< 0.001
Cal I	0.71	0.77	0.50	0.56	< 0.001

DMFT: Decayed, Missing, Filled Teeth
DMFS: Decayed, Missing, Filled surfaces
GI: Gingival index
Cal I: Calculus index
PI: Plaque index
SD: Standard Deviation

by DMFS and DMFT. DMFS and DMFT mean value were found to be higher in pregnant women than non-pregnant women, difference were recorded to be statistically not significant between pregnant and non-pregnant women. Also, **Table 1** demonstrates that the mean values of dental plaque, GI and Cal I were found to be higher in pregnant women than non-pregnant women, difference were recorded to be statistically significant compared to non-pregnant women.

For clinical pocket depth CPD, **table 2** shows that 15.3% of pregnant women of those who had pocket depth ≥ 4 mm, compared with 7 % among non-pregnant women, statistically significantly higher CPD among pregnant women compared to non-pregnant women.

Table 3 showed that DMFS and age were significantly related in both pregnant and non-pregnant women ($P < 0.001$). The more the age, the more the DMFS.

For Dental ante-natal care visits DANCV and oral variables. **Table 4** demonstrates the mean and standard deviation of oral variables in pregnant women according to DANCV. Out of 300 pregnant women 139 had DANCV while 161 had no DANCV. The oral variables DMFS, DMFT, PI and Cal I values showed no significant difference between pregnant women with DANCV and pregnant women with no DANCV. While for GI the difference was significant between pregnant women with DANCV and pregnant women with no DANCV.

Table 5 shows that of 14.4% pregnant women with DANCV, had pocket depth ≥ 4 mm, and 16.1% of pregnant women with no DANCV had pocket

Table 2: Distribution of the total sample, by clinical pocket depth.

CPD	Pregnant		Non - Pregnant		
	No.	%	No.	%	
< 4mm	254	84.7	279	93	0.002
≥ 4 mm	46	15.3	21	7	
Total	300	100	300	100	

CPD: Clinical pocket depth measured in millimetre

Table 3: Association between dental caries DMFS and age

Variables y	Variable x	Pregnant		Non pregnant	
		B*	P-value	B	P-value
DMFS	Age	0.63	< 0.001	0.49	< 0.001

DMFS: Decayed, Missing, Filled surfaces

* Regression coefficient. Correlation between DMFS and age in pregnant women: $B = 0.63$, $p < 0.001$ It means that when the age increase by one year, there will be an increase of 0.63 (units) of DMFS.

Table 4: Distribution of the pregnant women by oral variables according to dental ante-natal care visit (DANCV).

Oral variables	DANC	Pregnant			P value
		No.	Mean	SD	
DMFS	Yes	139	16.46	8.15	0.47
	No	161	17.23	10.1	
DMFT	Yes	139	9.55	3.28	0.47
	No	161	9.83	3.35	
PI	Yes	139	1.94	0.42	0.12
	No	161	2.01	0.44	
GI	Yes	139	2.29	0.51	0.02
	No	161	2.46	0.45	
Cal I	Yes	139	0.64	0.73	0.19
	No	161	0.76	0.79	

DANCV: Dental Ante-Natal Care Visit

DMFT: Decayed, Missing, Filled Teeth

DMFS: Decayed, Missing, Filled surfaces

GI: Gingival index

Cal I: Calculus index

PI: Plaque index

depth ≥ 4 mm of total 300 pregnant women. No significant difference was reported.

DISCUSSION

This study was designed to evaluate the oral health status, dental ante-natal care visit among pregnant women. The present study found no significant difference in the mean value of DMFT and DMFS between pregnant and non pregnant this was in agreement with.^{12,13,14} DMFT mean value among pregnant women in the present study was 9.89 which is considered to be lower

Table 5: Distribution of the pregnant women (Number and percentage) by clinical pocket depth according to dental ante-natal care visit (DANCV).

CPD Score	Pregnant			p value
	DANCV (%)	No DANCV (%)	Total (%)	
< 4mm	119 (85.6)	135 (83.9)	254 (84.7)	0.7
≥ 4mm	20 (14.4)	26 (16.1)	46 (15.3)	
Total	139 (100)	161 (100)	300 (100)	

DANCV: Dental Ante-Natal Care Visit
CPD: Clinical pocket depth measured in millimetre

than that found by Ruiz et al¹⁵ in Spain (13.8), by Vasiliauskien¹⁶ in Lithuania (12.06), by Radnai et al¹⁷ in Hungary (12.57) and by Tonella et al¹⁸ in Brazil (11.08), while it was higher than that displayed by Ageblusi et al¹⁹ in Nigeria (1.54), by Yas¹³ in Iraq (7.41), and by Yang Li et al²⁰ in China (1.5), such variation between the results is attributed to the methodological variation (criteria of diagnosis, method of examination and sample size) between the studies. The present study found that caries intensity significantly increased with age progressing in both pregnant and non-pregnant women, the same result was also reached by Yas¹³ and Radnai et al.¹⁷ This might due to the irreversibility and accumulative nature of dental caries with progressing age, which is a reflecting of the lifetime disease accumulation.^{21, 22, 23}

The current investigation revealed that plaque and calculus mean values were higher among pregnant than non-pregnant women, the difference were statistically significant, this agree with^{12,24} while it disagree with^{5,13,25,26} these studies found identical amount of plaque between the pregnant and non-pregnant women. This may be attributed to the oral hygiene negligence in the pregnant women. With poor oral hygiene, plaque index will increase during pregnancy.²⁷

The percentage of clinical pocket depth equal to 4 mm or more was significantly higher in pregnant women than non-pregnant. This result was like that reported by,^{13, 25, 28} this could be related to the severe gingival inflammation associated with gingival enlargement during pregnancy which causes the sulcus deepening because of the increased bulk of gingiva rather than periodontal destruction,²⁹ this indicates that gingival alterations are more marked than periodontitis during pregnancy. Overall, 46.3% of the pregnant women surveyed here report-

ed, a dental ante-natal care visit to the primary health center during their pregnancy; this finding was nearly similar to that reported by Gaffield et al;³⁰ Al Habashneh et al³¹ and Shahrbanoo et al,³² the limiting regular dental visits might be due to fear and or pregnant women felt that there had no dental problems and considered the oral manifestations associated with pregnancy as a normal event or situation which would resolve after delivery, furthermore might due to inability of pregnant women to afford the time for dental care visits. Also the results of the present study demonstrate only a significant difference in the mean values of gingival index which was less in pregnant women who had visited dental ante-care than women who had not visited dental ante-care, this might be due to that the women and the dentists might use services only conservatively during pregnancy or postponing their use altogether until after delivery also it can be suggested that simple preventive oral hygiene programs may help maintain healthy gingiva during pregnancy.

Prevalence rates of dental care use during pregnancy have been reported to range from 23% to 43%,^{30,33} and few women seek dental service in the population which could be primarily attributed to women's erroneous beliefs regarding the safety of dental examination. Pregnant patients normally receive care guidance from their obstetricians, which should also be reinforced by the regular dental advice and checkup.³⁴

CONCLUSIONS

This study showed that pregnant women had high levels of dental caries, gingival inflammation, plaque and calculus level, no influence of dental ante-natal care visits on the caries experience among pregnant women, but gingivitis was significantly less in pregnant women with dental ante-natal care visits. Health education campaigns to encourage pregnant women to visit dental ante- natal care and play a proactive role in the maintenance of the oral health of pregnant women are needed.

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Abbreviation list: Analysis of variance (ANOVA), Calculus index (Cal I), Clinical pocket depth (CP), Dental ante- natal care visit (DANCV), Decayed, Missing, filled surfaces (DMFS), Decayed, Missing, Filled Teeth (DMFT), Gingival index (GI), Plaque index (PI), Probability of chance (P value), Standard Deviation (SD), World Health Organization (WHO)

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