

Evaluation Of Socio Demographic Factors Affecting The Periodontal Health Of Pregnant Women

Abstract

Background: The development of periodontal diseases during pregnancy can be influenced by various socio-demographic factors such as socio-economic background, education and profession. This study evaluated the effect various of socio-demographic variables on the periodontal health of pregnant women.

Materials and Methods : 180 pregnant women, attending Gynaecology and Obstetrics outpatient department at SGRD Institute of Medical Sciences and Research, Amritsar were selected for the purpose of the study. The participants were examined for their periodontal health and various socio-demographic variables were recorded on performas designed for the purpose of study. The patient's periodontal health status was clinically determined using Plaque index (Silness and Loe), Gingival index (Loe and Silness) , Probing depth , Recession depth and Clinical attachment level. Statistical analysis was done thereafter.

Results : The results revealed that the plaque index scores , gingival index scores, probing depth and clinical attachment level increased with statistical significance when the socio-economic status was lower ($p < 0.05$). Highly significant differences were found in plaque index , gingival index, mean probing depth and clinical attachment level among different categories of socio-economic status, level of education and frequency of dental visits.

Conclusion: Periodontal disease due to accumulation of plaque was the most characteristic periodontal condition in this sample and was related to socio-economic status, level of education and frequency of previous dental visits. Further studies may be required in to determine the association of periodontal diseases in pregnant women with socio-demographic variables.

Key Words

Periodontal Disease, Pregnancy, Socio-economic; Demographic

Introduction:

Chronic periodontitis is an infectious disease resulting in inflammation within supporting tissues of the teeth, progressive attachment loss and bone loss.^[1] Pregnant women are considered at higher than normal risk of developing gingival and periodontal disease. Thus, it is of prime clinical interest to assess individual woman's risk for periodontal disease during pregnancy .Some of the studies have reported that sociodemographic variables influence the periodontal disease outcomes in pregnant women by influencing the individuals' resources to pay for care, access to care, understanding of the importance of oral health, and effective selfcare practices.^{[11],[12],[13]}

In light of these studies, we conducted a study on Pregnant women to evaluate the relationship between various socio-demographic and clinical variables affecting periodontal disease outcomes in them.

Materials And Methods:

The study included 180 pregnant women attending the Gynaecology and Obstetrics outpatient department (OPD) of SGRD Institute of Medical Sciences and Research, Amritsar. An informed consent was taken from all the subjects. A performa was designed for this study to record the patients' age, socioeconomic status, profession, education level, and place of residence. The professional group was categorized into : working and non – working. Place of residence was categorized as : Urban and Rural. Patients were also enquired about their frequency of dental checkups and brushing. Periodontal maintenance was grouped as frequent if patient had undergone multiple visits in the previous year , infrequent if rare visit was made and never when no dental visit was made ever. Data were also collected about trimester of pregnancy Then, periodontal examination was carried out for each patient.

Periodontal examination and assessment Periodontal examination was carried out by same examiner in all the patients in

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order to avoid interexaminer variability.

Following measurements were recorded for each tooth:

- (1) Plaque index: Presence of dental plaque was recorded according to the Silness and Loe plaque index^[14].
- (2) Gingival Index : Presence of gingival inflammation according to Silness and Loe.
- (3) Probing depth and recession depth was recorded using William's calibrated probe.
- (4) Clinical attachment level (CAL) was computed from the mean probing depth and recession depth measurements.

Statistical analysis

Mean and standard deviations were calculated for continuous variables and frequency distributions were studied for discrete variables. Analysis of variance (ANOVA) test was used to compare clinical indices between demographic and clinical characteristics and if results were significant, difference between categories was tested with the Chisquare test. Probability score of < 0.001 was considered as highly significant.

Results:

The sociodemographic characteristics of population are listed in

Table I. The mean age was 26.69 ± 4.39 years, with majority of study population in the 17-25 (59.47%) and 26-30 (33.68%) years old categories. The predominant economic profession was “non - working (65.6%), followed by “working ” (34.4%). Most of the women under study were illiterate , 33.9% having no formal education , 31.1% educated up to matric level , 17.2% were graduates , and 17.8% were postgraduates. More than half of the sample (74.4%) lived in urban areas. About 39.4% of the women had never visited dentist, 48.9% visiting dentist rarely and only 11.7% women were regular with their dental check ups.

Table II. Depicts the clinical variables related to pregnancy in the study population. The great majority of

Table I : Socio Demographic Description Of The Study Population

Variable	Number	Percentage
Age (In Years)		
< Or = 25	64	35.6
26-30	85	47.2
31-35	31	17.2
Mean Age	26.69±4.39	
Socio Economic Status		
Lower	71	39.4
Middle	78	43.3
Upper	31	17.2
Profession		
Working	62	34.4
Non Working	118	65.6
Education Level		
Illiterate	61	33.9
Matric	56	31.1
Graduate	31	17.2
Postgraduate	32	17.8
Residence		
Urban	134	74.4
Rural	46	25.6
Frequency Of Dental Visits		
Never	71	39.4
Infrequent	88	48.9
Frequent	21	11.7

Table II :Clinical Variables Related To Pregnancy

Variable	Number	Percentage
Trimester		
1	19	10.6
2	49	27.6
3	112	62.2

Table III : Plaque Index In Relation To Socio-demographic Variables

Variable	Mean ±sd	P Value
Age(In Years)		
< =25	2.04±0.666	0.039
26-30	1.91±0.768	
31-35	1.65±0.398	
Socio Economic Status		
Lower	2.5±0.29	0.000***
Middle	1.7±0.29	
Upper	0.85±0.29	
Profession		
Working	2.04±0.75	0.01
Non Working	1.6±0.46	
Education Level		
Illiterate	2.6±0.31	0.000***
Matric	2.05±0.21	
Graduate	1.2±0.244	
Postgraduate	1.06±0.43	
Residence	Mean ± Sd	P Value
Urban	1.90±0.80	0.669
Rural	1.95±.05	
Frequency Of Dental Visits		
Never	2.59±0.29	0.000***
Infrequent	1.66±0.32	
Frequent	0.69±0.20	
Pregnancy Variable	Mean ± Sd	P Value
Trimester		
1	1.98±0.65	0.778
2	1.86±0.71	
3	1.92±0.68	

participants were in the third trimester (62.2%).

Table III. Shows a plaque index score in relation to various demographic variables and clinical variables related to pregnancy. Highly significant difference was observed in the plaque index scores among various groups of different socioeconomic status (P=0.000) , education level and frequency of dental visits. Plaque index score was significantly high in age group <= 25 years and among “working women” because most of the women belonged to lower socio economic strata and were employed in low – status jobs. No association was found between plaque index scores and place of residence and Trimester of pregnancy.

Table IV. Shows gingival index score in relation to various demographic variables and clinical variables related to pregnancy. A highly significant difference was observed in the plaque index scores among various groups of different socioeconomic status (P=0.000)

Table IV : Gingival Index In Relation To Socio Demographic Variables

Variable	Mean ±SD	P value
Age(In Years)		
< =25	1.87±0.888	0.398
26-30	1.74±0.697	
31-35	1.67±0.452	
Socio Economic Status		
Lower	2.49±0.22	0.000***
Middle	1.54±0.45	
Upper	0.72±0.33	
Profession		
Working	1.89±0.78	0.04
Non Working	1.55±0.58	
Education		
Illiterate	2.49±0.24	0.000***
Matric	1.96±0.31	
Graduate	0.84±0.41	
Postgraduate	0.99±0.36	
Residence		
Urban	1.75±0.84	0.454
Rural	1.84±0.20	
Frequency Of Dental Visits		
Never	2.49±0.22	0.000***
Infrequent	1.50±0.44	
Frequent	0.50±0.00	
Pregnancy Variable	Mean ± Sd	P value
Trimester		
1	1.80±0.75	0.87
2	1.73±0.75	
3	1.79±0.73	

, education level and frequency of dental visits. Gingival index scores were significantly high in “working women” . Non significant association was found between age, place of residence and trimester of pregnancy.

Table V. Shows mean probing score in relation to various demographic variables and clinical variables related to pregnancy. Highly significant difference was observed in the plaque index scores among various groups of different socioeconomic status (P=0.000) , education level and frequency of dental visits. Probing depth was higher in age group <=25 years and among “ working women”. Non significant association was found between probing depth and place of residence and Trimester of pregnancy.

Table VI. Shows CAL scores in relation to various demographic variables and clinical variables related to pregnancy. Highly significant difference was observed in the plaque index scores among various groups of different

Table V.: Probing Depth In Relation To Socio-demographic Variables

Variable	mean ± SD	P value
Age(In Years)		
< =25	3.93 ± 1.27	0.038
26-30	3.89 ± 1.08	
31-35	3.35 ± 0.70	
Socio Economic Status		
Lower	4.87 ± 0.65	0.000 ***
Middle	3.58 ± 0.45	
Upper	2.32 ± 0.47	
Profession		
Working	4.07 ± 1.16	0.001
Non Working	3.50 ± 0.76	
Education		
Illiterate	4.85 ± 0.70	0.000 ***
Matric	4.17 ± 0.38	
Graduate	2.67 ± 0.47	
Postgraduate	2.65 ± 0.48	
Residence		
Urban	3.83 ± 1.24	0.373
Rural	4.00 ± 0.00	
Frequency Of Dental Visits		
Never	4.87 ± 0.653	0.000 ***
Infrequent	3.52 ± 0.502	
Frequent	2.00 ± 0.00	
Pregnancy Variable	Mean ± Sd	P value
Trimester		
1	3.84 ± 1.06	0.994
2	3.81 ± 1.11	
3	3.81 ± 1.11	

Socioeconomic status (P=0.000), education level and frequency of dental visits. CAL was non – significantly associated between professional groups, place of residence and Trimester of pregnancy.

Discussion:

Since, last two decades, evidence has mounted regarding the association between periodontal infections and gestational complications including pre-term births (< 37 weeks), low birth weight (< 2500 g) and or pre-term low birth weight and pre-eclampsia.^{[2],[3],[4]} Periodontal diseases were reported as potential source of maternal infection and inflammation that may induce pre-term birth. Many physiological and hormonal changes occur during pregnancy. It is a well known fact that these changes could alter the oral metabolism. These include alterations in hormonal levels, microbial strains present in the oral cavity, immune response, and cellular metabolism.^{[5],[6]}

The increase in progesterone levels

Table VI : Clinical Attachment Levels In Relation To Socio Demographic Factors

Variable	Mean ± Sd	P Value
Age(In Years)		
< =25	4.03 ± 1.32	0.029
26-30	3.94 ± 1.09	
31-35	3.38 ± 0.76	
Socio Economic Status		
Lower	4.87 ± 0.735	0.000 ***
Middle	3.57 ± 0.730	
Upper	2.35 ± 0.55	
Profession		
Working	3.66 ± 1.07	0.067
Non Working	3.99 ± 1.18	
Education		
Illiterate	4.83 ± 0.778	0.000 ***
Matric	4.21 ± 0.679	
Graduate	2.64 ± 0.555	
Postgraduate	2.65 ± 0.545	
Residence		
Urban	3.82 ± 1.28	0.327
Rural	4.02 ± 0.57	
Frequency Of Dental Visits		
Never	4.87 ± 0.73	0.000 ***
Infrequent	3.52 ± 0.71	
Frequent	2.00 ± 0.00	
Pregnancy Variable	Mean ± Sd	P Value
Trimester		
1	4.05 ± 1.22	0.776
2	3.87 ± 1.12	
3	3.84 ± 1.15	

causes loss of keratinization of gingival epithelium, proliferation of fibroblasts, impaired chemotaxis, and phagocytic activity of neutrophils.^{[7],[8],[9]} The prominent microorganism *Prevotella intermedia* increase in number because it uses progesterone as a nutrient which is available in GCF^[10].

The incidence of gingival inflammation in pregnant women has been reported to range from 36% to 100%^[15]. Silness and Løe determined that the correlation between the amount of dental plaque and the severity of gingivitis was higher postpartum than during pregnancy, and concluded that “some other factor” was involved in the etiology of pregnancy

Gingivitis^[14]. Hormonal and vascular changes associated with pregnancy can exaggerate the response of the gingiva to bacterial plaque^[16]. It has been reported that healthy gingival stays usually unaffected, and thus pregnancy itself does not cause gingivitis, but dental plaque or calculus is required for

initiation of gingival changes during pregnancy^[17]. Good oral hygiene practices, however, can minimize gingival disease during pregnancy^{[16],[18]}. Therefore, good oral hygiene of patients in study population which is obvious from the low plaque index score could be attributable for low prevalence of periodontal disease in this population.

It is difficult to make comparison of study results with the previous studies because of the differences in study populations and study designs. Our study results are somewhat in accordance with study of Miyazaki et al^[19].

They conducted a survey concerning periodontal disease prevalence and treatment needs in pregnant women ranging from 16 to 43 years of age in Kumamoto and Kitakyushu cities, Japan. They used CPITN values for the assessment of periodontal condition, which is quicker, simpler, and very useful for the field of public oral health. In our study, William’s calibrated probe was used to determine pocket depth. In their study, signs of periodontal disease were observed in 95% of the pregnant women and 96% of the nonpregnant women. More sextants showing healthy periodontal conditions were observed in the pregnant than in the nonpregnant women. In our study also most of the pregnant women had good periodontal health except women belonging to low socioeconomic status.

The most frequent age category in the present sample is 26 to 30 years old (47.2%), similar to that reported by Offenbacher et al^[24]. That paper also included pregnant adolescents, which might have had a significant effect on the findings, whereas our study did not include any pregnant adolescents.

Our study results are in accordance with the study of Machuca et al^[11]. They evaluated the periodontal status of pregnant women and its relationship to demographic variables in the province of Seville, Spain, and periodontal condition in their study population was related to different sociodemographic variables such as professional level, level of education, and previous periodontal maintenance. In our study also the periodontal status worsened as the socioeconomic status, education level and frequency of previous dental visits was

less. As in their study, majority of our patients also came from lower economic strata, having high rates of unemployment (65.5%) and the remainder were mostly employed in a low status jobs where the treatment of periodontal diseases are not taken seriously.

Tilakarathne et al.^[20] studied the effects of pregnancy on the periodontium, in a rural population of Sri Lankan women and their study results showed that pregnancy had an effect only on the gingiva and not on periodontal attachment levels. In our study, highly significant results were obtained in relation to Plaque index, gingival index, mean probing depth and CAL (clinical attachment levels) in women of lower socioeconomic status, lower education level and in women who have never visited their dentist. It might be an attributed negligence of oral hygiene in women of lower socioeconomic status leading to increased gingival inflammation during pregnancy.

The levels of oestrogens are elevated in pregnancy leading to changes in keratinization of the gingival epithelium and alteration in the connective tissue ground substance. This results in decreased effectiveness of the epithelial barrier. These effects combined with vascular changes caused by elevated hormone levels give rise to aggravated response to the irritant effects of plaque, resulting in overt gingivitis.

Yalcin et al.^[21] studied the effect of sociocultural status on periodontal condition in pregnancy in Turkish women by recording clinical measurements including the plaque index, gingival index, and probing depth. They evaluated interaction between these parameters and their sociocultural background. They reported the correlation of clinical index scores with educational level and periodontal care.

Wandera et al.^[13] had examined periodontal status and tooth loss in pregnant Ugandan women and assessed the relationship with sociodemographic factors, parity (number of children), dental care, and oral hygiene. The oral condition of pregnant women was characterized by low prevalence of bleeding, high prevalence of calculus deposits, low prevalence of 4-5 mm

pockets, and by a moderate prevalence of tooth loss. They concluded that age, social status, oral hygiene, and parity might be the potential risk factors for chronic periodontal disease in their study population. In our study, only the socioeconomic status, education, frequency of dental visits were a potential risk factor in the development of periodontal disease.

Moss et al.^[22] emphasized that race is a significant factor governing the incidence and progression of periodontal disease and African Americans were more likely to experience incidence / progression of periodontitis as compared to other races. Jeffcoat et al. published interim results from an ongoing study in Alabama and reported that their population was made up of 83% African Americans, and that these subjects had significantly more periodontal disease. Unfortunately they did not report how much more^[23].

Other factors such as socioeconomic status and profession are also important. Most of the patients (43.3%) belonged to category of middle socioeconomic status. Although most of the patients were non working (65.6%), majority of the sample was uneducated, having no formal education (33.9%). In the study of Machuca et al.^[11], most of the patients were housewives but majority of them were educated up to primary level.

So, factors such as living area, ethnicity, socioeconomic status, education, and oral hygiene of patients may be responsible for the differences in study results of various studies taking into consideration influence of various sociodemographic factors on periodontal health of pregnant women.

Conclusion:

In the population of pregnant women investigated under this study, the clinical and socioR09;demographic characteristics showed highly significant correlation with socioR09;economic status, education level and frequency of previous dental visits, with gingival index, plaque index, pocket depth and clinical attachment level. Periodontal disease due to accumulation of plaque was the most characteristic periodontal condition in this sample and was related to socio economic status, level of education and previous periodontal

maintenance. Further studies may be required in Indian population to determine the association of periodontal diseases in pregnant women with socioR09;demographic variables.

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