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Research Article

Changes in Periodontal Health during Various Stages of Pregnancy; An Observational Study

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Abstract

Introduction: Plaque control and periodontal treatment for pregnant women is becoming very important according to several studies that correlate pregnancy with periodontal disease.

Materials and Methods: A total of 150 pregnant women were examined at different stages of pregnancy. Both plaque and gingival index scores were measured and recorded.

Results: Pearson correlation test was conducted, which revealed a positive value of .680 and .610 for gingival and plaque index respectively.

Conclusion: Gingival disease increase with the progression of pregnancy.

Keywords: *Gingival Health; Pregnancy; Plaque Accumulation*

Introduction

Plaque control and periodontal treatment for pregnant women is becoming very important according to several studies that correlate pregnancy with periodontal disease. Immune responses and inflammation of the host contribute to periodontal disease in pregnant women. The increase secretion of sexual hormones during pregnancy in some patients alters the immune system which can be attributed to gingival and gingivitis diseases in almost 50% of pregnant women as demonstrated [1]. Other factors include an increase in the permeability of the gingival capillary and the change of bacterial composition [2].

Other studies have demonstrated a relationship between periodontal disease and low birth-weight delivery [3,4]. Hartnett [5] revealed the importance of the recognition, prevention, and treatment of oral health problems in pregnant women was discussed and educational strategies that integrate inter-professional oral health competencies for the treatment of periodontal diseases in pregnant women were proposed.

Enabulele [6] stated that the awareness of obstetrics residents of the oral health component of management of nausea and vomiting in pregnancy was assessed and found that (95.7%) of the respondents were not aware of the oral health component for the management of nausea and vomiting. Wu., *et al.* [7] explained a review of progesterone and estrogen hormones on the change of subgingival microbiota and immunologic physiological mediators in periodontal tissue was conducted.

Objectives of the Study

It is believed that pregnancy is not a risk factor for periodontal disease [2]. However, some studies suggest that it has a direct effect on teeth health [1]. The extent of this effect on the initiation and progression of caries and other non-caries disease is not clear [2]. The objective of this study is to examine and analyze the periodontal status of pregnant women at successive stages of pregnancy using data collection and analysis.

Materials and Methods

Data collection was done on patients visiting dental clinic in Riyadh, Qatif and Khobarcity during 2017-2018. A total of 150 pregnant women were examined at different stages of pregnancy. Both plaque and gingival index scores were measured and recorded. Descriptive as well as inferential statistics was conducted using Statistical Package for Social Sciences (SPSS) version 19. Chi square test and Pearson correlation was done in order to determine the type of relationship between pregnancy and periodontal disease.

Results

Descriptive statistics revealed that 13% of the study participants were in their first trimester of pregnancy, 32% in their second trimester and 55% in their third semester (Figure 1). On the other hand, gingival as well as plaque indices were measured for all the participating patients, which revealed that 6% had mild, 42% had moderate and 52% had severe gingival disease (Figure 2). As far as plaque index was concerned, 8% of the pregnant women had mild, 56% had moderate and 36% had severe plaque accumulation (Figure 3).

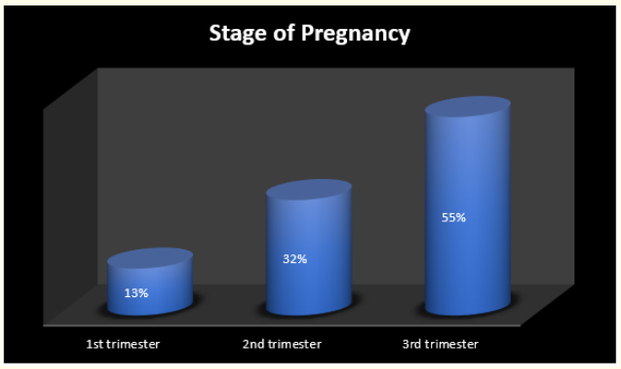

Figure 1: *Stages of pregnancy reported among the study participants.*

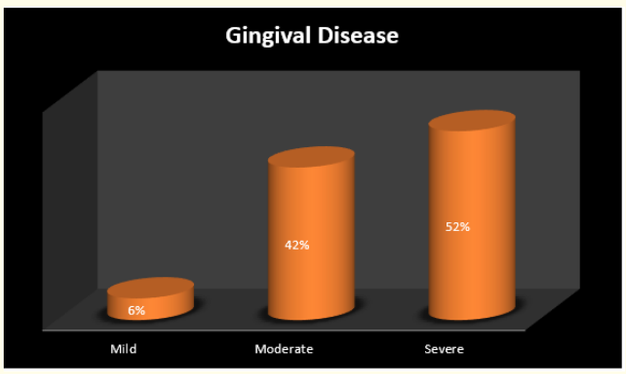

Figure 2: *Percentage of different types of gingival diseases among pregnant patients.*

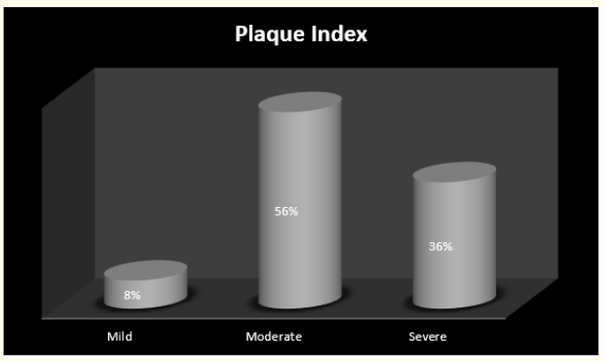

Figure 3: *Plaque index of the pregnant participants in this study.*

Furthermore, inferential statistics were also performed in order to determine the association between pregnancy and poor oral hygiene. Pearson correlation test was conducted, which revealed a positive value of .680 and .610 for gingival and plaque index respectively. These values indicate that with increase in the pregnancy trimesters, there is a significant increase in the severity of gingival as well as plaque diseases (Table 1).

Study Variables	Pearson Correlation	P-value
Gingival Disease	.680	0.001
Plaque Index	.610	0.001

Table 1: *Correlation of gingival and plaque disease with pregnancy.*

Finally, Chi-square test was done in order to determine any significant comparison between pregnancy trimesters and gingival as well as plaque disease. Tables 2 and 3 indicate that 47% of the patients in their first trimester had mild gingival disease, whereas 82% of the patients with severe gingival disease were in their third trimester. This comparison was statistically significant with p-value: 0.001. As far as the plaque index was concerned, 53% of the patients in their first trimester had moderate plaque accumulation. Whereas, 57% of the third trimester patients had severe plaque accumulation with this comparison being statistically significant (P-value: 0.001).

Trimester	Mild	Moderate	Severe	P-value
First	47%	32%	21%	0.001
Second	0%	88%	12%	
Third	0%	18%	82%	

Table 2: *Prevalence of gingival disease in different trimesters of pregnancy.*

Trimester	Mild	Moderate	Severe	P-value
First	47%	53%	0%	0.002
Second	6%	81%	13%	
Third	0%	43%	57%	

Table 3: *Prevalence of plaque disease in different trimesters of pregnancy.*

Discussion

Pregnancy and gingival health have been linked with one another as mentioned in the literature review. However, we aimed to determine the relationship of various pregnancy stages with the level of gingival disease severity. Our study findings have reported a positive relationship between the above mentioned variables. It can be noted that the patients in their first trimester did not suffer from great deal of gingival problems. However, the gingival health deteriorated as the progression of pregnancy went on towards the later trimester.

These findings were supported by a study conducted by Niederman [8], who conducted a systematic review to determine the correlation of pregnancy and gingival disease. The results were extracted using forty-four articles and the results revealed that pregnant women in their first trimester had lower prevalence of gingival disease. However, this number exceeded in quantity as well as severity as the trimesters moved from first to second and then eventually third. Conclusion of the study stated that there was a significant rise in gingival inflammation as the pregnancy of the patients progressed.

It is important to assess the periodontal health of pregnant patients as there is a risk of the microbial transmission to the baby and may cause dental caries in infants. Our study finding suggests that as pregnancy progresses, the accumulation of plaque is also increased. Plaque houses microbes that are responsible for causing dental caries as well as gingival diseases. Therefore, it is imperative to educate the pregnant patients to take special care of their oral health during this sensitive period of pregnancy [9].

Another aspect of interpreting our study findings may be the relationship between plaque and gingival disease. With high amount of plaque in the oral cavity, it causes the gingival inflammation. This finding was also supported by a clinical study conducted in Taiwan among pregnant women as the subjects. The results revealed that the patients having gingival inflammation during pregnancy exhibited higher prevalence of plaque accumulation in their oral cavity [10].

In general, the periodontal health of pregnant patients seemed to be on the poorer side, which was also the case with another investigation conducted by Rezazadeh., *et al* [11]. They designed their study using a group of pregnant patients and comparing their oral health with non-pregnant patients. The findings suggested that the pregnancy group tend to have higher number of dental problems as compared to the non-pregnancy group. This leads to the emphasis on maintaining the oral health of pregnant women throughout the course of nine months [12].

Conclusion

The prevalence of gingival disease increases as the trimesters of pregnancy progress from first to third. There is also a positive correlation of plaque with pregnancy stages.

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