

## PERIODONTAL CONDITIONS IN PREGNANT AND NON – PREGNANT WOMEN IN KARACHI

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### ABSTRACT

*The objective of the study was to compare the effectiveness of clinical plaque treatment removal in pregnant and non-pregnant females in Karachi, Pakistan. A quasi experimental study was designed with a sample size of 108 women, both pregnant and non-pregnant. Three antenatal clinics from different areas of Karachi were selected. Total duration of study was two and a half years. A total of 86 pregnant females were selected along with 22 non-pregnant females by random sampling. Pregnant females in the first trimester were placed in group-A while from second trimester in group-B. A control group of non-pregnant females were placed in group-C. Groups A and B were given half mouth treatment for the first month. They were retreated with complete mouth therapy in the second month. Groups C were given a full mouth treatment. CPI (Community Periodontal Index) and PLI (Plaque Index) were recorded. All subjects were put on a maintenance regimen of Triclosan containing tooth paste. Significant changes in Plaque Index (PLI) and Community Periodontal Index (CPI) were recorded after plaque removal. Half mouth plaque removal resulted in a better outcome regarding gingival health and plaque severity in Group A and B as compared to Group C ( $p < 0.05$ ). Intervention (in terms of plaque removal and triclosan dentifrice) resulted in a significant reduction in PLI and CPI scores in all groups. The intervention by plaque removal at early stage of pregnancy along with maintenance with triclosan had resulted in a more favorable outcome regarding gingival diseases and plaque.*

**Key words:** PLI, CPI, Triclosan, Gingivitis, Plaque removal.

### INTRODUCTION

Women's health issues have come to the forefront of medical research only within the last decade. This came about only after significant pressure was exerted by physicians and activist groups. These groups recognised that the majority of clinical trials involved men primarily and that sex differences were not being addressed.<sup>1</sup>

Oral health care in pregnancy is often avoided and misunderstood by physicians, dentists and patients. Evidence-based practice guidelines are still being developed. A few studies have reported the potential effects of periodontal treatment during pregnancy on pregnancy outcomes, periodontal status, and inflammatory biomarkers. Previous researches have demonstrated that the host response to periodontal infection had resulted in the local production of cytokines and biological mediators such as prostaglandins and interleukins, as well as the systemic production of serum antibodies.<sup>2-5</sup>

Oral health care of pregnant women in Pakistan is in a debilitating state and needs to be looked after, as negligent approach and deliberately hiding the issue is more of a norm. It is proven that preg-

nancy has an effect on the oral health status. However changes in periodontal status of pregnant females is more likely due to the physiological changes associated with pregnancy than any other specific factors. Some oral conditions already present may be influenced by the hormonal changes, which in some cases exacerbate or ameliorate minor oral pathologies.<sup>6</sup> It is well known that hormonal changes during pregnancy are associated with oral mucosal changes most of which are reversible clinically.<sup>7-10</sup> The reasons for these changes are not well established. However they can complicate pregnancy.<sup>11</sup> Of these changes the ones most well written about is pregnancy gingivitis and pregnancy epulis (alternate names – pregnancy tumour, epulis gravidarum, pregnancy granuloma).<sup>7-10</sup> Other changes associated with pregnancy include chloasma, facial telangiectasia, sialorrhea, tooth surface loss usually related to vomiting when severe (hyperemesis gravidarum), increased mobility of teeth, changes in the severity of oral aphthae.<sup>10,12-15</sup> Other observations are less specific and may be part of the general state of health. These include mucosal changes seen with anaemia e.g. pallor. Severe mucosal/gingival bleed-

ing, that may or may not be associated with Disseminated Intravascular Coagulation (DIC) may occur.<sup>11</sup>

Knowledge of these conditions is important and the complication arising from them can be minimised by early diagnosis and prompt intervention. They can be managed satisfactorily until childbirth when these conditions may regress.<sup>7-10</sup> It is also useful that the patient is made aware of the transient nature of some of these conditions and reassured accordingly. This study was conducted with these considerations in mind. The objective of this study was to compare the effectiveness of clinical plaque removal treatment in pregnant and non-pregnant women in Karachi, Pakistan.

### SUBJECTS AND METHODS

A quasi experimental study was designed with a sample size of 108 women, among them 86 were pregnant, and 22 were non pregnant – the controls. Total duration of study was two and a half years.

Three different localities were selected in Karachi city, on the basis of having diverse socio-economic groups resident in the area. From these localities conveniently three antenatal / gynaecological clinics were sited which had a large inflow of patients. The incharge doctors were requested to participate in the study along with the staff. Selection of patients was on voluntary basis and was by convenient sampling. Patients in the first and second trimester were taken. Only first of second time pregnant females (who had > 1 year of gap after first birth) were chosen. Non pregnant females above age 22year were taken as a reference indicator and comparative tool. Their selection was from different dental clinic on voluntary convenient sampling.

After confirmation of the status of pregnancy, clinically by the obstetrician / gynaecologist the patients were divided into Group A (1<sup>st</sup> trimester of

Pregnancy) and Group B (2<sup>nd</sup> trimester of Pregnancy). These groups were separately examined around the head and neck (extra-oral and intra-oral examination) by a dental surgeon. The findings were recorded on a WHO oral health assessment form.<sup>11</sup> Specific oral and extra-oral conditions / pathologies were recorded. Their Community Periodontal Index (CPI) and Plaque Index (PLI) scores were recorded. In CPI, oral hygiene and periodontal health were noted (score range 0-4), whereas in PLI, only the presence of plaque and its extent of spread were considered (score range 0-2). Lymph node enlargement and facial asymmetry were recorded. Those results that did not relate to any of the oral pathologies were excluded from the study.<sup>16</sup>

Patients were also asked if they were aware of the conditions observed and whether they had received any professional advice from any medical staff (doctor or nurse) in the past or present.

The pregnant patients were given half mouth clinical plaque removal therapy (on the right side of the jaw) and reviewed every month for the next four months by the researchers. The subjects were taught to floss on the right side of the jaws only and use TRICLOSAN containing tooth paste overall in the mouth. Use of soft toothbrush bristle was also advised twice daily by modified Stillman's technique. After the first month, left jaw was also given a clinical plaque removal therapy and CPI and PLI were recorded. After an elapse of four month of initial plaque removal, intra-oral examination was again performed with CPI and PLI being recorded again. Extra-oral examination was also performed. Subjects were reviewed every month till one month after parturition. Patients were specially requested

**Table 1:** Extra oral and intra oral findings (start of study).

	Group A (n = 41)	Group B (n = 45)	Group C (n = 22)
<b>Extra oral</b>			
TMJ <sup>11</sup> and myofacial pain	2	5	3
<b>Intra Oral</b>			
Presence of plaque	32	42	18
Pregiancy epulis / pyogenic granuloma	0	2	0
Aphthous ulceration (minor)	0	2	2
Aphthous ulceration (major)	0	0	0
Telangiectasia	6	11	1
Tooth surface loss associated	2	6	0

with severe vomiting		
Mild gingival bleeding	37	14
Moderate gingival bleeding	0	31

<sup>11</sup>TMJ = Temporomandibular joint

to check bleeding gums and gingival swelling on the first and second day of parturition. Intra-oral and extra-oral examination along with CPI and PLI in-dex were rerecorded at the end of study, before doing clinical plaque removal again.

The selected non pregnant females were put in Group C and had an extra-oral and intra-oral examination. Find-ings were recorded on WHO oral health assessment form and CPI and PLI were calculated before clinical plaque removal of the entire dentition. Brushing with soft toothbrush using *TRICLOSAN* containing toothpaste twice daily and using modified Stillman's technique were also advised along with flossing. These fema-les were re-called every month. After six months they were again given a CPI and PLI recording and then clinical plaque

removal performed.

After gathering baseline data, Group A and B received first intervention by half mouth (right quadrant) plaque removal treatment, while Group C received full mouth plaque removal treatment. Groups A and B were then recalled after 1 month and after recording oral conditions a full mouth plaque removal was performed. All participants were given oral hygiene instructions after each intervention. Group A and B were then recalled after parturition. Group C were finally recalled for data collection after 6 months of initial intervention.

The tables were made using World Dental Federation (FDI) nomenclature for dentition.

**RESULTS**

The results were put in a tabular form. The values depicted in tables were mode of values collected.

The mean CPI recorded at the baseline was 1.8 for Group A (SD 0.3), 2.6 for Group B (SD 0.5), and 1.3 for Group C (SD 0.2). The mean PLI recorded at the baseline was 1.6 for Group A (SD 0.4), 2.8 for Group B (SD 0.3), and 0.6 for Group C (SD 0.3). One month after the intervention, the mean CPI for right quadrant of Group A was 0.9 (SD 0.5). CPI for right quadrant for Group B was 1.7 (SD 0.4). For the Left Quadrant, CPI for Group A was 1.8 (SD 0.4) and for Group B 2.8 (SD 0.3). CPI for Group C was 0.2 (SD 0.1).

After the first month, mean PLI of

**Table 2:** Extra oral and intra oral findings (end of study).

	Group A and B post-parandal (n = 86)	Group C (n = 22)
<b>Extra oral</b>		
TMJ' and myofacial pain	1	3
<b>Intra Oral</b>	1	0
Presence of plaque		
Pregnancy epulis / pyogenic granuloma	0	0
Aphthous ulceration (minor)	0	0
Aphthous ulceration (major)	0	0
Telangiectasia	2	0
Tooth surface loss associated with severe vomiting	8	0
Mild gingival bleeding	0	0
Moderate gingival bleeding	0	0

'TMJ = Temporo-mandibular joint

**Table 3:** 3 CPI (start of study).

Tooth No (FDI)	Group A Right quadrants	Group B Right quadrants	Group A Left quadrants	Group B Left quadrants	Group C (full mouth)
16	2	2	-	-	1
21	-	-	1	3	1
24	-	-	1	2	1
36	-	-	2	2	1
41	2	3	-	-	2
44	1	2	-	-	1

right quadrant for Group A was 0.9 (SD 0.4), for Group B 1.2 (SD 0.5). Mean PLI for left quadrant for Group A was 1.8 (SD 0.6), for Group B 2.9 (SD 0.4). Mean PLI for Group C was 0.1 (SD 0.1).

At the fourth month interval, mean CPI for Group A was 1.2 (SD 0.6) and for Group B 1.9 (SD 0.5). After the fourth month, mean PLI for Group A was 1.1 (SD 0.9) and for Group B 1.9 (SD 0.6). At the end of study, mean CPI for Group A was 0.3 (SD 0.2), for Group B 0.4 (SD 0.2) and for group C 0.2 (SD 0.2).

At the end of study, mean PLI for Group A 0.3 (SD 0.3), for Group B 0.7 (SD 0.2), and for Group C 0.2 (SD 0.1).

Overall effects, visible by accumulated data showed a significant change in the PLI and CPI of the pregnant women after plaque removal. Mono quadrant plaque removal predicted better gingival health (CPI) in Group A (1<sup>st</sup> trimester of pregnancy) as compared to Group B (2<sup>nd</sup> trimester of pregnancy) with  $p < 0.05$ . Complete removal of plaque resulted

in better oral health of pregnant mothers till parturition as can be seen from table 2 when compared with table 1. None of the mothers complained of bleeding gums after the second day post-parturation as gingival health was established early after birth of child.

In comparison with Group A and B, non expectant females of Group C showed better gingival health and maintenance ( $p < 0.05$ ). They also did not have any complaint with gingival bleeding once plaque removal was performed.

The CPI score at the start of the study (table 3) was compared with CPI at the end of study (table 4) after intervention in pregnant and non pregnant women. CPI of pregnant women ranges from 1-3, but after intervention it came out to be 0 with a single exception. In the non-pregnant women score ranges from 1-2 which is declined to 0 after intervention with a single exception.

Similarly, the PLI score at the start of the study (table 5) was compared with

PLI at the end of study (table 6) after intervention in pregnant and non pregnant women. PLI of pregnant women ranges from 1-2, but after intervention it came out to be 0 with two exceptions. In the non-

**Table 4:** CPI End of study \* = 6 months.

Tooth No (FDI)	Group A and B Right quadrants	Group B and B Left quadrants	Group C *(full mouth)
16	0		0
21	-	0	0
24	-	0	0
36	-	0	0
41	1	-	0
44	0	-	0

**Table 5:** PLI at start of study.

Tooth No (FDI)	Group A Right quadrant	Group B Right quadrant	Group A Left quadrant	Group B Left quadrant	Group C (full mouth)
16	1	2	-	-	1
21	-	-	1	2	0
24	-	-	1	2	0
36	-	-	1	1	0
41	2	3	-	-	2
44	1	2	-	-	1

**Table 6:** PLI end of study \* = 6 months.

Tooth No (FDI)	Group A and B Right quadrants	Group B and B Left quadrants	Group C *(full mouth)
16	0	-	0
21	-	1	0
24	-	0	0
36	-	0	0
41	1	-	0
44	0	-	0

pregnant women score ranges from 1-2 which is declined to 0 after intervention with a single exception.

## DISCUSSION

Oral health care in pregnancy is often avoided and misunderstood by physicians, dentists, and patients. Evidence-based practice guidelines are still being developed. A recent international similar study carried out in USA by Silk H et al suggested that every pregnant woman should be screened for oral risks, counseled on proper oral hygiene, and referred for dental treatment when necessary. Appropriate dental care and prevention during pregnancy may reduce poor prenatal outcomes.<sup>17</sup>

Results from our study have shown that intervention with triclosan at earliest phase of gingivitis during pregnancy would result in better healing response by improving the CPI and PLI scores as supported by similar studies which revealed that triclosan dentifrice provided statistically significant reduction in gingivitis as compared to control group (non-pregnant women).<sup>18,19</sup> Plaque accumulation would harbor bacteria and other pathogens that could cause more than gum disease, if opportunity provided. Increased chance of cardiac valvular vegetations and plaque, bacteraemia, mucoitis and vaginitis, pharangitis and laryngitis and lymphadenopathies may be present. Even bad breath and nausea could render the expectant mother dislike nutritive food resulting in malnourishment. Immuno-compromised or malnourished individuals are earliest ones to be compromised by opportunistic pathogens. Hormonal changes in pregnancy does not make a person immunocompromised but may alter homeostasis of these individuals which may cause physiological and psychological changes. It has been reported since long about gingival deterioration during pregnancy, but little had been known if intervention for treatment could result in betterment of the condition. When the healthcare workers, doctors and patient were inquired about the oral hygiene care during pregnancy, they were not aware of the conditions and treatments. It should be advised that before planning a pregnancy a female should go through professional oral hygiene treatment and seek professional advice if required. If pregnancy is established then earliest possible visit to a dentist or hygienist could aid in better gingival care of the patient.

It is suggested by international studies to supplement pregnancy guidelines by including at least two visits to the dentist as an integral part of antenatal checkup.<sup>20</sup> Health care workers and general population should be made well aware of the different oral pathologies and treatment options available.

The women with any specific oral mucosal pathology had not been alerted to the condition nor were they aware or worried about their oral condition.

More extensive research work is required in this field at a national level.

It **concludes** that intervention by plaque removal at early stage of pregnancy along with maintenance with triclosan resulted in a more favorable outcome of gingival diseases and plaque scores.

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