CHAPTER 5

DISCUSSION

Gingivitis and periodontitis are caused by the accumulation of dental plaque. A biofilm initially forms in the gingival crevices and later extends into the periodontal pocket. From a single periodontal pocket approximately 100 cultivable bacterial species could be isolated. In two separate studies, Meurman [178] and Piovano [179] state that the diverse environmental and host factors, involved in the accumulation of bacteria and the diversity of the microbial flora present in the oral cavity, make the identification of particular species which are responsible for initiating periodontitis, very tedious and highly complex.

In our study, we met with the same predicament. However, we could find the predominant bacteriae in the various stages of womenhood. We found that in Post pubertal, Fertile and Post menopausal stages, the dominant aerobic bacteriae were the same viz. *Streptococcus mutans* and *Lactobacillus*. Among anaerobic bacteriae, *Peptostreptococcus* and *Veillonella* showed a higher presence when compared with other anaerobic species.

Earlier, the bacterial flora in periodontitis had been studied by others. Lynch and Beighton state that there is a progressive flora increase in the anaerobic bacterial flora during the progression of the disease and as a result the aerobes and the facultative anaerobes show a decrease [180]. As periodontitis develops, Moore and Moore noted a shift in the balance of the normal microflora in the subgingival area. [181]. In 2006, Daniluk et al noted that in the case of a healthy individual, the prevalence of Gram positive anaerobes such as *Streptococcus sp* along with some obligate gram positive anaerobes was present in a higher percentage. The Gram negative anaerobic bacteria that were consistently isolated from periodontic sites were *Porphyromonas gingivalis*, *Prevotella intermedia*, *Capnocytophagea*, some *Spirochetes* and *Aggregatibacter actinomycetomcomitans* [30]. A similar shift was observed in our study also, particularly marked in the stages of puberty, pregnancy and menopause.
In our study, we found non pregnant women had less prevalence of periodontitis when compared with their pregnant counter parts. Within the pregnant category, an increase in periodontitis in the second trimester was present when compared with the First trimester and the post partum stages. Jensen et al had found a similar result. His opinion was that during pregnancy, the systemic levels of sex hormones showed an increase which can be correlated to the increase of some gram negative anaerobes in the oral cavity [182].

Gursoy’s study [160] shows that the presence of *Prevotella intermedia* increased two fold, in the second trimester. Their study found that no change occurs in the oral micro flora of the non pregnant women. This finding is concordant with the results of our study. Our study also showed that a low prevalence of periodontitis among the non pregnant group. In our study we found that *Tannerella forsythia* was more prevalent among pregnant women.

American Academy of Periodontology consensus report 1996 has pointed out three species as the etiological agents for periodontitis. They are *Aggregatibacter actinomycetomcomitans*, *Porphyromonas gingivalis*, and *Tannerella forsythia*. These organisms appeared to be responsible for bleeding on probing and in increasing the periodontal pocket depth [72]. In our study, the results of Real Time PCR showed the presence of the same above said obligate anaerobic bacteria in the subgingival plaque.

According to Leonhardt the putative pathogens such as *Porphyromonas gingivalis* and *Prevotella intermedia* were seen in 60% of the subgingival samples [183]. Apart from *Porphyromonas gingivalis* and *Prevotella intermedia*, *Tannerella forsythia* and *Aggregatibacter actinomycetomcomitans* showed higher prevalence when compared to other obligate anaerobes.

Kamma et al studied moderate and minimal lesions seen in young adults with progressive periodontitis. They observed microbial complexes associated even with severe periodontitis. He was able to identify *Actinomyces* and *Streptococcus, Hemophilus, Capnocytophagea* and *Veillonella* from minor periodontitis condition
This is in accordance with the current study were we isolated *Actinomyces, Hemophilus, Capnocytophagea* and *Veillonella* from pubertal group and post pubertal group.

In a study done by Sizonenko shows that there was a fluctuation in estradiol, progesterone and testosterone during puberty[185]. In another study conducted by Nakagwa *et al* showed an increase in the microbial flora from pre puberty to puberty. Our study also shows a similar trend. According Nakagwa *et al* [186] during puberty there was an increase in the Gingival Index score when compared to pre puberty and Puberty stage. In this study an attempt was made to compare prevalence of periodontitis from pubertal group to post pubertal group. The results show an increase from 52.7% to 61.8%. Till now there was no study on the comparison between Puberty and Post Puberty stage.

Jarvensivu *et al* note the role of *Candida albicans* in the pathogenesis of Periodontitis and its ability to adhere to the periodontal tissues. They also stated that the *Candida albicans* produced psuedohyphal germination within the periodontal pocket [187]. In the current study *Candida albicans* was isolated from only two subjects.

Sharma *et al* conducted a cross sectional study in Moradabad population, Uttar Pradesh, India on the prevalence of aggressive Periodontitis in relation to systemic manifestations like anxiety, depression, loss of weight and loss of appetite. In that study the sex ratio was 2.65: 1 (male: female). He noted that 57% females had aggressive periodontitis. This is a higher proportion when compared to males. They also noted that the aggressive periodontitis is associated with systemic manifestations [188]. This higher percentage of aggressive periodontitis among females may be due to the hormonal fluctuation.

According to Chauhan *et al*, among 12 year old children in Himachal Pradesh 60% female were affected by oral health problem. He also noted that girl children showed a higher percentage of health problems when compared to boys. Gingival bleeding was seen among 12.9% and calculus deposit was seen in 21.8%
children. From his study he noted that children from rural area had unhealthy gingiva 23.9% when compared to those of urban area 17.1% [125]. This increase in oral health problems can be minimized by giving awareness among girls form school level.

In Kerala an epidemiological study was conducted by Jose among children of rural area reported a lesser prevalence rate of 15%, which is lesser compared to other reports from India [189]. This is in contrast to the other reports on prevalence of periodontitis among children.

The prevalence rate of periodontitis among pregnant women according to Shamshi et al depends on various factors such as age, socioeconomic status, ethnicity and the personal habits of each individual [190]. Our study shows a different conclusion to that given by Shamshi et al. There was no statistical significance between the brushing habits and gingivitis in this study.

According to a study conducted by Chaithanya et al it was noted that the there was a high rate of periodontitis and presence of periodontal pathogens among women within the age group of 25-29 yrs. It was also noted that there was a direct relationship between the education status of the pregnant women and their periodontal health status [133]. In the current study there was no statistical significance between Oral health Status and periodontitis, which is in contrast with the results from the study conducted by Chaithanya et al.

Al Habashneh reported that the prevalence of gingival prevalence of pregnant women ranges from 36% to 100% [135]. Cross sectional studies was done on the relation between gingival disease and pregnant women as early as 1960s. According to Silness and Loe as pregnancy advances gingival disease also increases and persist till delivery. Post partum decrease in the gingival inflammation was noted [136]. This is in accordance with our study, where a 12% decrease in periodontitis was noted among post partum women.
In a study conducted by Snophia Suresh on Pre menopausal women and Post Menopausal women, the latter study group showed significantly higher Periodontal parameters such as probing depth, loss of tissue attachment and alveolar bone loss. It can also be noted that the bone mineral density was significantly lower when compared to Pre menopausal women [70]. In our study also we found that 84% post menopausal women were osteoporotic and had periodontitis. From the current study a positive association between bone mineral density and periodontitis can be derived. The results of the current study are in correlation with results observed by Snophia et al.

In a study conducted by Brian H. Mullally et al on Oral Contraceptive status and periodontitis among young adults aged 20-35 years 42% (n=50) percent were pill users and they had deeper mean probing depth when compared with non users [101]. He stated that the current oral pill users had poorer periodontal health. In our study among 12 oral contraceptive users 7(58%) had periodontitis.

According to Barbour et al and Palmer et al smokers have a higher chance of getting periodontitis [191-192]. According van Winkelhoff smokers have a higher incidence of periodontal bacteria [193]. This is in accordance with the current study, where 73.6% (n=19) of tobacco smokers had periodontitis.