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Assessment Of Gingival Status Among Asthmatics A Hospital Based Study / Case Control Study.

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ABSTRACT

Bronchial asthma is an inflammatory disease characterised by hyperresponsiveness of the tracheobronchial tree. Asthma is characterised by recurrent episodes of wheezing,breathlessness, chest tightness, coughing that can vary over time and intensity.Generally asthmatics are also found to have poor oral hygiene. Asthma is said to have affected the gingival health like causing periodontitis and gingivitis.It has been seen in a certain study that the presence of IgE due to asthma has led to periodontal destruction leading to periodontitis.Asthma is also said to cause dry mouth due to open mouth breathing in asthmatics and also due to the usage of bronchodilators and corticosteroids.

Materials and methods: the data for the present study n=258 was collected after analysing the case sheets. The collected data was subjected to statistical analysis using the SPSS software by IBM of version 23.

Results: From the results of our study we can observe that females had more asthma at 55.04% than male at 44.96%. It is also seen that asthmatics had more affected gingival health, with gingivitis at 40.70% and periodontitis at 49.22% and healthy gingiva at 10.08% due to the use of inhalers and also due to the habit of mouth breathing.The prevalence of periodontitis was also found to be higher in female at 26.74% than male at 22,48% due to the higher usage of anti asthmatic medication in females than males.

Conclusion: From the results of our study patients with asthma had higher levels of periodontal disease. Patients with asthma should be educated regarding the oral hygiene, correct dietary habits, appropriate use of inhalers to maintain better oral hygiene and prevent the future risk of periodontal disease.

Aim : Aim of this study was to assess the gingival status among asthma patients

Keywords: gingival status, asthma, periodontitis, gingivitis, dry mouth, innovative study.

INTRODUCTION:

Asthma is a serious health issue which is being more prevalent now a days . People of all ages are being diagnosed with this disease all over the world which can lead to this disease being severe and almost fatal. Bronchial asthma is an inflammatory disease characterised by hyperresponsiveness of the tracheobronchial tree. Asthma is characterised by recurrent episodes of wheezing,breathlessness, chest tightness, coughing that can vary over time and intensity (1). Asthma is triggered by allergic(dust, pollen,

mold) and non-allergic factors(anxiety, stress, exercise, smoke,virus and other irritants) which proceed along with a cascade of events leading to bronchial inflammation. Evidence is there to prove that asthma is also associated with genetic predisposition(2). Bronchial asthma was found to be increasing mostly in young children.The prevalence of bronchial asthma is increasing due to the increase in the allergens present in the environment and their rate has now increased over 10% in children (3).

Asthma is by far the most common chronic disease. Asthma has its onset at any age and they are controlled by intake of medication. Asthma has various effects on oral health.Generally asthmatics are also found to have poor oral hygiene.Some studies have reported controversies regarding the effect of asthma and its medication on the gingival status(4). Asthma is said to have affected the gingival health like causing periodontitis and gingivitis. Periodontitis is a gum disease which can destroy the soft tissue as well as the bone which supports the tooth(5). Gingivitis is an inflammatory condition characterised by redness, irritation and swelling in the gingiva(6). It has been seen in a certain study that the presence of IgE due to asthma has led to periodontal destruction leading to periodontitis (7).

Asthma and the medications is said to cause dry mouth due to open mouth breathing habit and can also cause gummy smiles due to muscles being pulled in an abnormal way in this habit. Saliva is the important defense mechanism in the oral cavity which is affected by the open mouth breathing habit. Asthma and its medication are found to have a negative impact on the production of saliva and their flow rate and has led to an increase in the gingival inflammation (8). Inhalers have a low pH which further can impair the oral health and are also said to have sweeteners which can increase the prevalence of caries(9). Certain studies have also reported of increase in the calculus in the oral cavity in asthmatics.In certain studies it has been found that there has been an increase in calcium and phosphorus in the saliva of asthmatics that has led to an increase in the calculus amount in the oral cavity(10).

Asthma is a very common disease now being encountered in our society and has affected oral health in various ways. Thus it is very important in our study to find and assess the gingival status among asthmatics and find if there is a significant association between asthmatics and gingival status to prevent further damage to the oral health of the individual.

Our team has extensive knowledge and research experience that has translate into high quality publications. (11–23),(24–28) (29) (30)

MATERIALS AND METHODS:

The data for the present study were collected by analysing the case sheets of patients visiting Saveetha Dental College, the case sheets were reviewed and analysed individually. Ethical approval was obtained from the institutional ethical committee. The advantages of the present study is available data and similar ethnicity and geographical locations could be the limitations of our study.

The inclusion criteria for the study were mainly the patients who had asthma with three main divisions namely, healthy gingiva with no bleeding index, gingivitis with bleeding index of score 1 and 2 and periodontitis with clinical attachment loss about 2-4 mm.The exclusion criteria for the study was patients

who had asthma with underlying systemic disease.Based on the inclusion and exclusion criteria 258 samples were obtained. Parameters like age,gender, periodontal status were evaluated and tabulated.To minimise the sampling bias random sampling was done. The collected data was subjected to statistical analysis using the SPSS software by IBM of version 23. The dependent variables were periodontal status and independent variables were age, gender.

RESULTS:

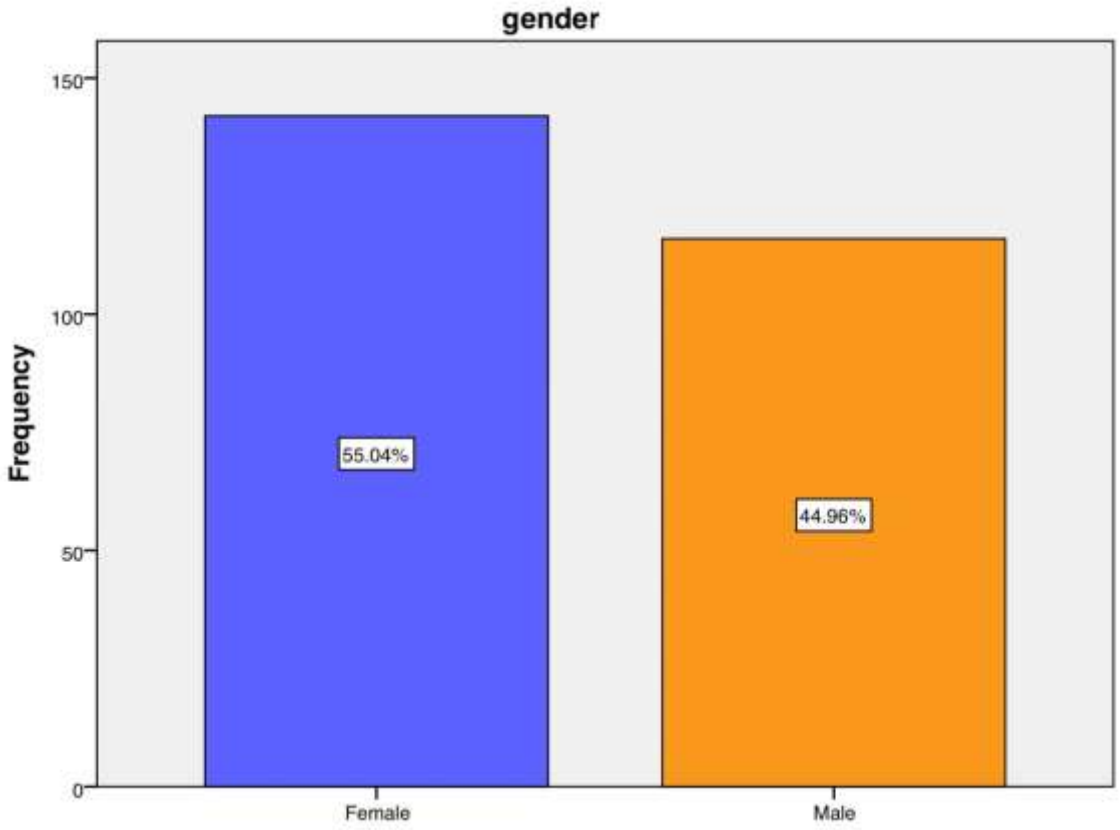

Figure 1**:** This graph depicts the gender based prevalence of asthma. The prevalence was found to be more in female at 55.04% than male at 44.96%. The X axis shows the gender while the Y axis shows the number of asthma patients.The blue colour denotes female population and orange colour denotes the male population.

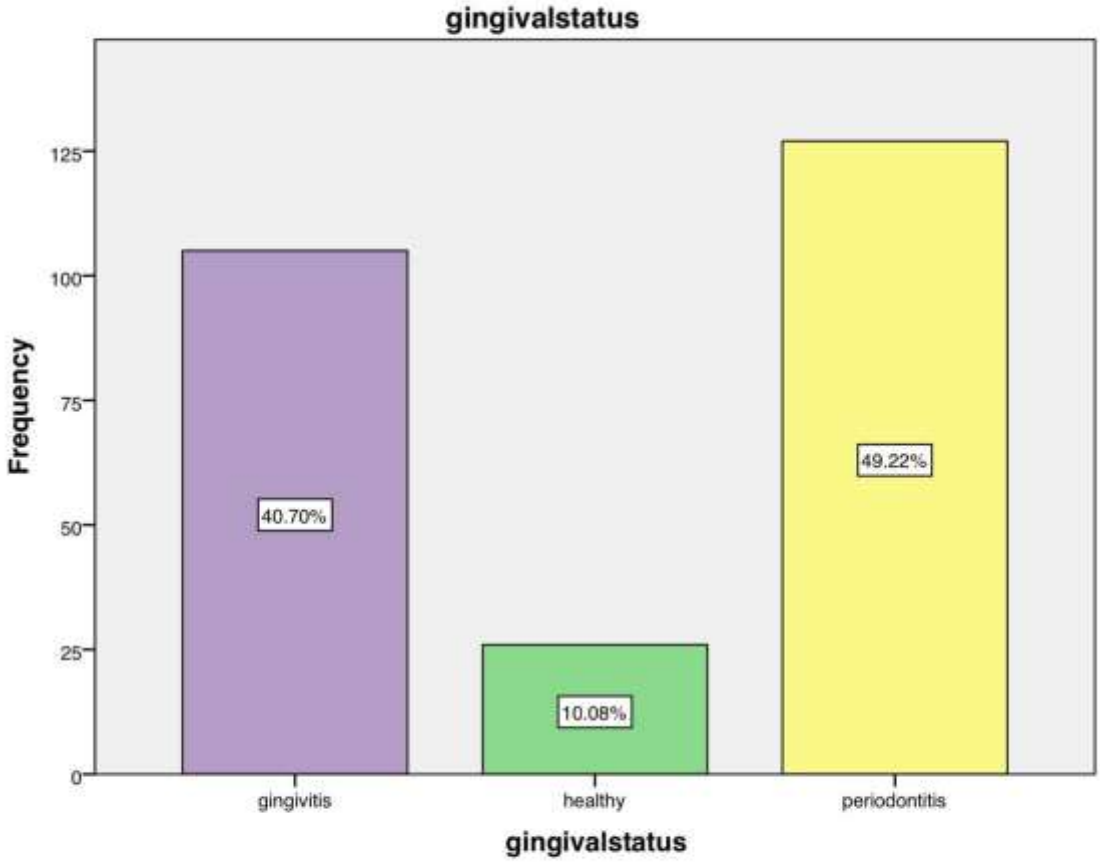

Figure 2: The graph depicts the prevalence of gingival status among asthmatics.The X axis shows the gingival status and Y axis shows the number of asthma patients. The purple colour denotes gingivitis , green colour healthy gingiva and yellow colour denotes periodontitis. The prevalence of periodontitis was found to be highest at 49.22% , gingivitis at 40.70% and healthy gingiva the least at 10.08%.

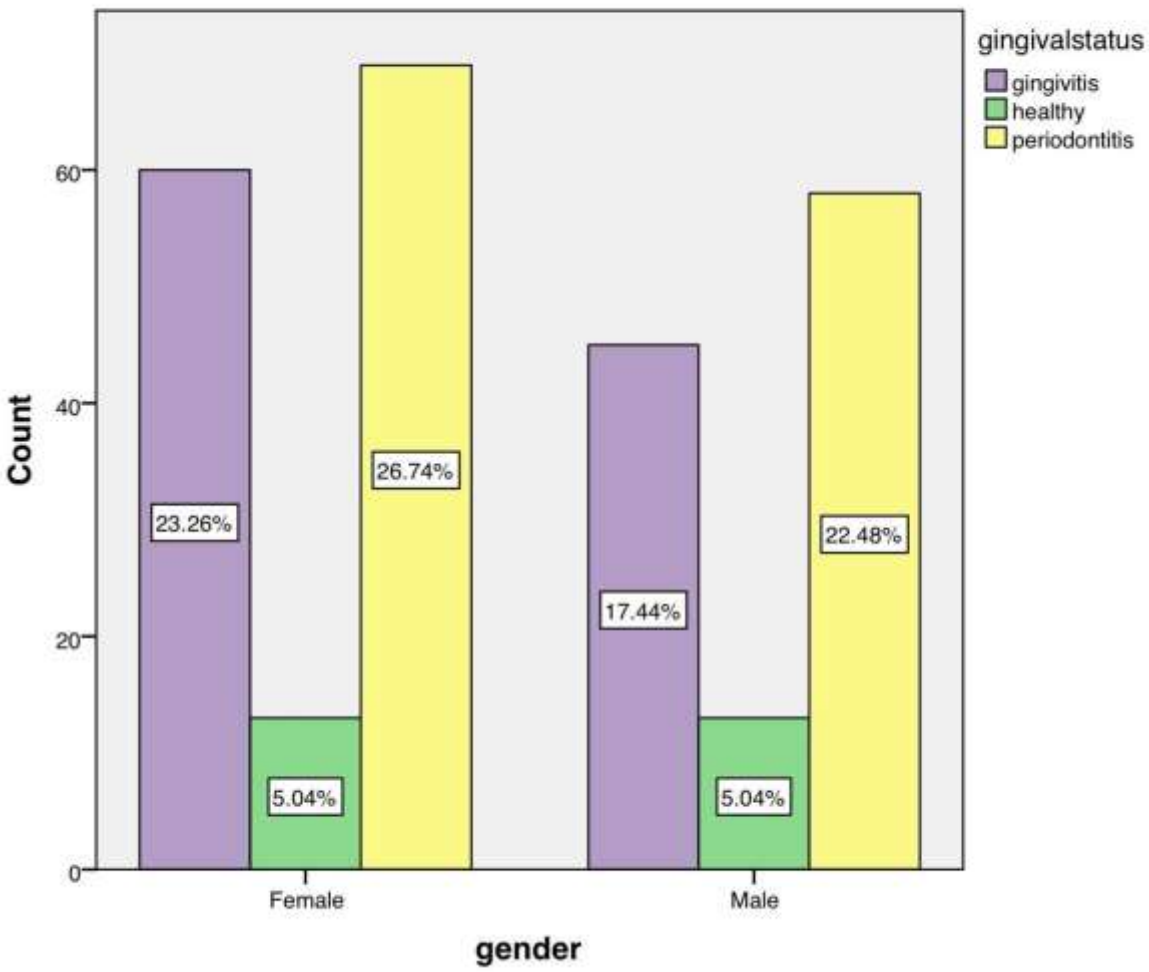

Figure 3: Bar graph depicts the association between the gingival status and gender. The X axis shows the gender and Y axis shows the gingival status among asthmatics. The purple colour denotes gingivitis , green colour healthy gingiva and yellow colour denotes periodontitis. The chi square test was conducted and the P value was found to be 0.786($p<0.05$). The association was not statistically significant.

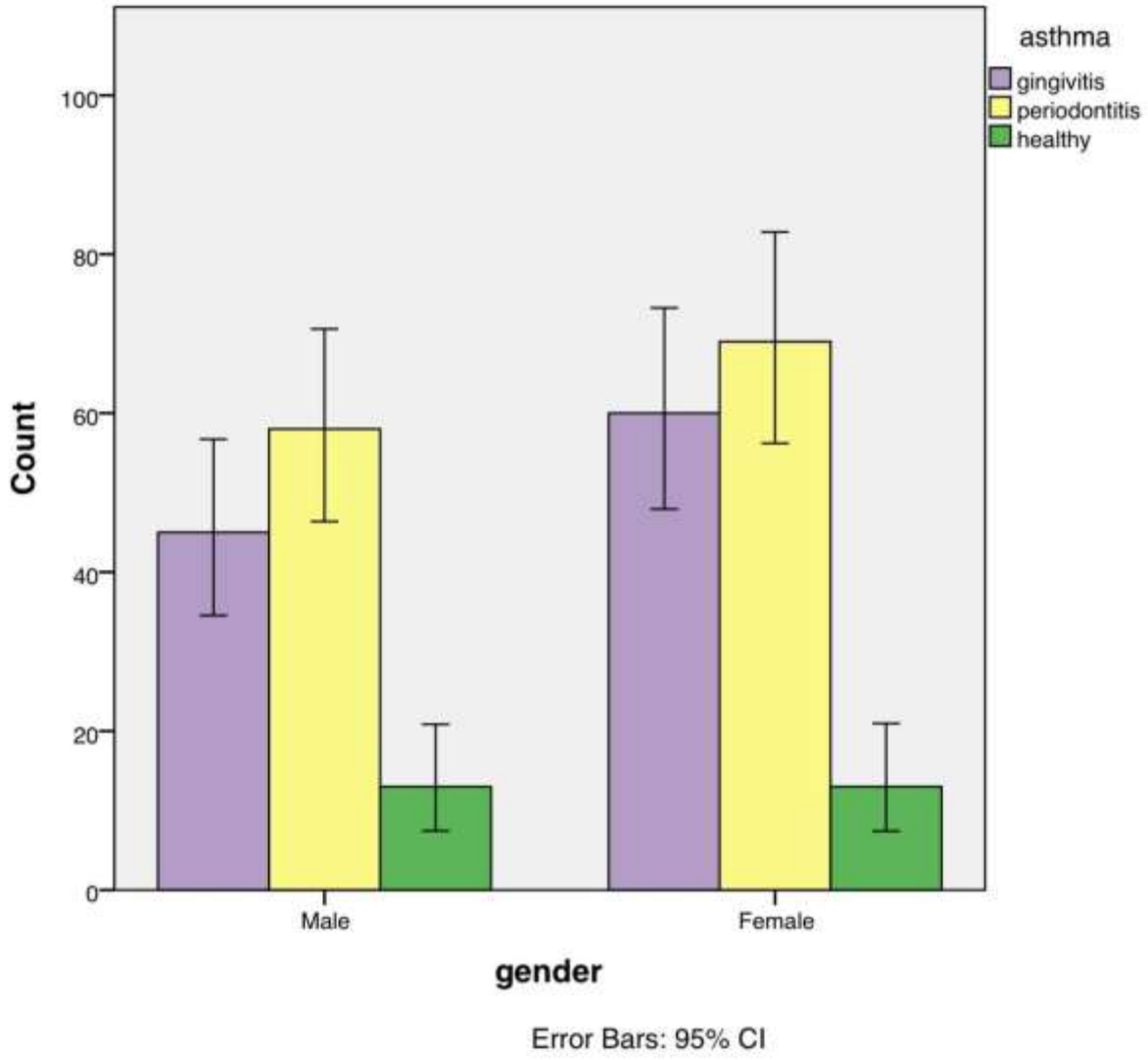

Figure 4: This error bar graph depicts the association between the gingival status and gender. The X axis shows the gender and Y axis shows the gingival status among asthmatics. The purple colour denotes gingivitis , green colour healthy gingiva and yellow colour denotes periodontitis.

DISCUSSION:

Oral health plays a very significant role. Asthma has affected oral health to a greater extent. Asthma is found to be in a greater prevalence in females than male and is attributed to the fact of hormonal changes and genetic susceptibility(31). In our study also we can find more prevalence of asthma patients in females at 55.04% than male at 44.96% (Fig1). Some studies have shown the results where there was a significant increase in plaque and gingival scores among asthmatics as compared to the control group(32). In our study the prevalence of healthy gingiva in asthmatics was only 10.08% while affected gingiva with gingivitis and periodontitis was at 89.92% with gingivitis at 40.70% and periodontitis at 49.22%(Fig2). Inhalers, topical steroids application and mouth breathing habits are some of the profound reasons to alter the gingival status among asthmatics.

In some studies it has been seen that bronchodilator inhaler has showed the increased caries rate with high significance over the other control group and was observed that antiasthmatic medication have a significant effect on periodontal disease and dental caries and patients are recommended to take up more precautionary measures and better hygiene practices(33). Inhalers are found to have a negative effect on the oral cavity by creating a dry mouth and can increase the chance of caries, gingival inflammation and other infections in the oral cavity. In a study conducted among 100 asthmatic children , it was observed that the asthmatic population has significantly more plaque, gingivitis and calculus compared to healthy controls and was found to be the fact that higher IgE levels in asthmatics have caused this(34). Also the IgA levels were found to be less in saliva of asthma patients and paves way for periodontitis , gingivitis and other oral health issues to occur.

In some studies the effect of topical corticosteroids has shown inflamed gingiva and loss of teeth have been observed due to periodontitis which occurs as following consequence. The corticosteroids can get retained in the oral cavity which makes it more vulnerable to pathological mobility in relation to lower teeth. Corticosteroids cause fluctuations in the saliva pH,decrease in the release of saliva, increase in plaque accumulation and are the predisposing factors to periodontal disease. Corticosteroids can also cause decrease in cortisol in the saliva and affect the alveolar bone which make the teeth more profound to mobility.

In yet another study it was observed that the frequency of gingival inflammation was higher and salivary flow rate was lower in asthmatic group due the habit of mouth breathing(35). The mouth breathing is also considered as one of the predisposing factors for initiation of periodontal disease and/or its progression. The anterior dental open bite produced by chronic mouth breathing is associated with high incidence of periodontal disease and high risk of loosing the anterior teeth in early ages. This causes the absence of anterior guidance which also predisposes the patients for temporomandibular disorders. The precise mechanisms are not fully understood, but probable causes are gingival surface dehydration, decreased epithelial resistance to bacterial plaques, and lack of salivary auto-cleaning.

A systematic review conducted in 2018 showed a strong association between gingivitis and asthmatics (36). The prevalence of periodontitis was found to be higher in females at 26.74% than male at 22.48%(Fig 3) due to the increasing prevalence of use of inhalers and anti asthmatic medication in females rather than male and also higher prevalence of asthma in females than males.

Certain studies proved that periodontium was affected more in asthmatics while in contrast there were some other studies which showed no difference between asthmatics in comparison with the control group (37). Another study by Roberto Rivera et al. showed that patients with severe periodontitis were less likely to be associated with asthma in the parameters concerning the bleeding on probing sites and plaque index (38). In certain other studies also the association between asthma and periodontitis was found to be non significant and was found to be casual.

It is necessary in future to conduct further studies so that the exact mechanism in asthma and periodontal disease can be assessed and necessary steps can be taken to preserve the oral health.

CONCLUSION:

From the results of our study patients with asthma had higher levels of periodontal disease. Patients with asthma should be educated regarding the oral hygiene, correct dietary habits, appropriate use of inhalers to maintain better oral hygiene and prevent the future risk of periodontal disease.

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CONFLICT OF INTEREST:

The authors declare no conflict of interest.

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