ASSESSMENT OF DENTAL MANAGEMENT OF PATIENTS WITH RESPIRATORY DISORDERS REPORTED IN A SPECIAL CARE CLINIC IN A HOSPITAL SETTING: A RETROSPECTIVE STUDY

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Running title: Respiratory disorders in Special care clinic

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ABSTRACT:

Respiratory disorders are commonly seen as the co-morbidity encountered in patients in dentistry, there are various microorganisms related to respiratory disorders that are also seen in oral cavity peptostreptococcus, actinomyces. In adult tuberculosis and asthma and in paediatric patients asthma can be encountered as the most common respiratory disorder. Results of the present study proves that the most common dental treatment performed on patients with respiratory disorders include oral prophylaxis as the oral hygiene status was fair to poor in majority of the dental patients. Tuberculosis can be seen as a common respiratory disorder apart from chronic obstructive pulmonary disease and asthma, among the dental patients seen with respiratory disorder. Statistical test was done using Pearson chi-square analysis (0.342, p value > 0.05) which shows no statistical significance between respiratory disorder and dental treatment, age and gender.

Keywords: Respiratory disorders, asthma,chronic obstructive pulmonary disease, tuberculosis, dental considerations

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INTRODUCTION:-

The respiratory disorders which are commonly prevalent include asthma, chronic obstructive pulmonary Disease (COPD) and Tuberculosis. (Claramunt Lozano, Sarrión Pérez and Gavaldá Esteve, 2011; Choudhury et al., 2015; Harrington, Prado and Barry, 2016; Chaitanya et al., 2017; Choi, Bae and Lee, 2018; Maheswari et al., 2018). Microorganisms that are biomarkers for respiratory disease present in the oral cavity include Actinomyces, Peptostreptococcus, Treponema.(Steele et al., 2015; Shen et al., 2016; Rohini and Kumar, 2017; Gaeckle et al., 2018; Patil et al., 2018) . Certain microorganisms such as actinomycetemcomitans can cause respiratory disease such pneumonia through aspiration (aspiration pneumonia) leading to symptoms such as shortness in breath, chest pain, coughing. Presence of certain types of cytokines promote the growth of microorganism in the oral cavity ,the cytokines present in the periodontal tissue has been the source of the growth of respiratory organisms such as pneumonia and fusobacterium in the oral cavity , this occurs due to unclean teeth and negligence of oral prophylaxis.(Rohini and Kumar, 2017) The salient features of patients presenting to dental office with respiratory disorders/disease include- difficulty in breathing, aspiration of dental materials-Obstructive sleep apnea, oropharyngeal candidosis, xerostomia, chronic bronchitis, drug allergy/sensitivity to NSAIDs, aspirin, and also gingival inflammation/enlargement, for paediatric patients with respiratory disorder. A recent study suggests that about 4-5% of patients between 5-15 years have been affected by Asthma, presence of certain organisms such as pseudomonas and staphylococcus in the oral cavity due to non maintenance of oral hygiene has lead to cause of pulmonary abscess and pneumonia leading to hospitalised infection in those patients who are admitted in the intensive care units, advise of oral prophylaxis is done in patients with high risk of respiratory distress((Muthukrishnan, Bijai Kumar and Ramalingam, 2016; Petti, 2016; Muthukrishnan and Kumar, 2017). The aim of this study is to find the prevalence of respiratory disorders in patients reported in a special care clinic in a hospital setting, the objective of this study is to find the prevalence of respiratory disorders in relation to age, gender and dental treatment given, to evaluate if any association between respiratory disorder and dental treatment, age distribution and gender exist.

MATERIALS AND METHODS:

The retrospective study on assessment of respiratory patients treated in a special care clinic was conducted in a hospital setting; the data collection was done by reviewing the patients from the special care clinic in a hospital setting. Ethical approval of study was obtained from the Scientific Review board. The ethical approval number for the present study is SDC/SIHEC/2020/DIASDATA/0619-0320. The number of researchers includes 3 (Principle
investigator, guide and reviewer). The start date of the sample is 01-06-2019 and the end date for sample collection is 01-04-2020. The number of case sheets reviewed was 40, cross-verification of the study is by means of review, follow up and duplication removal, Measures taken to minimize sampling include convenience sampling by selecting patients diagnosed and reported with medical records of evidence of respiratory disorders. 

The current study was conducted in a hospital setting in which the demographic data such as age, gender and medical history such as presence/absence of systemic disease and co-morbidities such as diabetes, hypertension were retrieved from the database. The general and oral examination details such as oral hygiene status were retrieved from the database. The various dental treatments undergone by the patients such as extraction, restoration and oral prophylaxis were also noted. The inclusion criteria include dental patients with respiratory disorders with proper medical record documentation of type of respiratory disorders. Exclusion criteria include dental patients with respiratory disorders with incomplete documentation of both medical records of respiratory diseases and dental treatment procedures. The dependent variable considered as the types of respiratory disorder and independent variables were age, gender, dental treatment done. The descriptive statistical tests used were frequency distribution tests. The inferential statistical tests such as the Pearson-chi square test were done. After collection of data, the statistical analysis that were done included Pearson-chi square test, frequency distribution test using statistical software SPSS software (ver.26). 

RESULTS AND DISCUSSION:-

The respiratory disorder that was commonly diagnosed in the current study was tuberculosis with prevalence of about (55%) followed by asthma in about 40% patients. And studies have proven that tuberculosis is most prevalent (Misra et al., 2015; Subashri and Maheshwari, 2016; Venugopal and Uma Maheswari, 2016). The most common dental treatment done amongst the respiratory disorder patients in this study population was oral prophylaxis, the mean age of the patients in the study is around 40.6 years, there is no significant gender predilection in this study as there are equal male/female distribution, the mean oral hygiene status amongst the patients in this study is 2.2. (Misra et al., 2015; Muthukrishnan and Waramukulasuriya, 2018) Studies done by Steinbacher et al(2001) have shown that one of the most common oral manifestation in patients with respiratory disorders include gingivitis, especially patients presenting with asthma have an increased rate of plaque deposits and due to increased habits such as ‘mouth breathing’ can result in dryness of the mouth (Xerostomia) leading poor oral hygiene(Steinbacher and Glick, 2001; Dharman and Muthukrishnan, 2016; Chaitanya et al., 2018). Other studies done by Claramunt et al(2011) has shown that COPD-asthma has been the most common respiratory disorders encountered in dental office, also in many cases, the dental treatment is deferred as the patients are subjected to ingestion of dental materials hence a pre-treatment prophylaxis/medical consultation is done.(Claramunt Lozano, Sarrión Pérez and GavaldaEsteve, 2011; Subha and Arvind, 2019) The above studies show results which are similar to the findings in the present study in which COPD, Asthma along with bronchitis will aggravate the existing oral manifestations.
The various respiratory disorders seen in the Special care dental clinic among which tuberculosis has been
diagnosed in the majority of cases. Frequency distribution shows tuberculosis at 50% to be the most frequent,
asthma at 35.7%, wheezing at 7.1% and Chronic obstructive pulmonary disease at 7.1 %. (Graph 1)
Frequency distribution of dental treatment done in patients in respiratory disorders shows that dental treatment such
as extraction was done in majority 42.9% of patients, followed by restoration in about 28.6% of patients, oral
prophylaxis in 21.4%, root canal therapy in 7.1 %. (Graph 2)
The gender distribution in patients with respiratory disorders revealed study is at the similar levels, with frequency
distribution revealing male as 50% and female as 50% (Graph 3).
The age distribution in patients with respiratory disorders revealed a higher number of patients between 30-60 years
of age. Frequency distribution of respiratory diseases show that about 35.7% of patients between 10-30 years, 42.9%
between 30-60 years and 21.4% are above 60 years. (Graph 4).
The association of number of patients with respiratory disorders and the dental treatment done revealed oral
prophylaxis was done more in patients diagnosed with asthma and extraction was done more in patients with COPD
and tuberculosis. Association analysis between respiratory disorder and dental treatment was done using chi-square
test, Pearson Chi-square value is 0.342 has shown that there is no statistical significance (P value >0.05).
The association between respiratory disorders and age distribution in patients with respiratory disorders, the
association analysis was done using chi-square test, Pearson Chi-square test reveals that there is no association
between respiratory disorder and age (0.342, p value >0.05) (Graph 6).
The association between respiratory disorders and gender revealed tuberculosis seen more prevalent in female patients and asthma was most prevalent in male
patients. Association analysis was done using chi-square test, Pearson chi-square test reveals that there is no
association between respiratory disorders and gender (0.342, p value >0.05) (Graph 7).
The overall consensus is that there were no previous studies to suggest any particular dental treatment protocol to be
followed for any particular disorder. The limitations of the study were that the overall sample size was less. Future
scope includes the coordination between a pulmonologist and the dentist is essential for providing a proper tailored
treatment for every patient and to standardize a proper treatment protocol for dental patients with respiratory
 disorders.

CONCLUSION:--
The results of the study conclude that the most common respiratory disorders with dental considerations were
asthma, COPD, and tuberculosis patients treated in Special care clinics. The present study proved that tuberculosis
was the most common respiratory disorder seen among dental patients. Frequency analysis revealed that extraction
was the most common dental procedure done in patients with respiratory disorders. Age distribution shows that
patients between 30-60 years have higher prevalence of respiratory disorders. The statistical test using the Pearson
chi-square test revealed that there is no statistical significant association between respiratory disorder and dental
treatment, age and gender. Future studies with aim in devising proper dental treatment protocol and multicentric
studies on assessment of dental considerations need to be conducted to promote oral health in dental patients with
respiratory disorders.

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AUTHOR CONTRIBUTIONS:

First author (Mukundh Chaithanya.V) performed the analysis and interpretation and wrote the manuscript. Second author (Dr. Uma Maheswari.T.N) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr.Manjari Chaudhary) participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

CONFLICT OF INTEREST:

The authors declare no conflicts of interest.

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Graph 1: Pie chart representing the prevalence of various dental patients with respiratory disorders. Tuberculosis (blue) at 50% to be the most prevalent followed by asthma (bluish-green) at 42.9%, and Chronic obstructive pulmonary disease (pink) at 7.1%.
Graph 2: Bar graph representing the frequency of dental treatment done in dental patients with respiratory disorders. X-axis represents the various dental treatments done in respiratory disorder patients. Y-axis shows frequency of percentage of dental patients with respiratory disorders. Frequency analysis showed that extraction was highly prevalent 42.9% (black), followed by restoration in 28.6% (light green), oral prophylaxis in 21.4% (pink) and least prevalent was root canal therapy as 7.1% (yellow).
Graph 3: Bar graph representing the gender distribution in dental patients with respiratory disorders, X-axis represents the gender and Y-axis represents the frequency percentage of dental patients with respiratory disorders. Gender distribution in this study was in the same levels with 50% frequency distribution in males (blue) and females (red).
Graph 4: Bar graph representing the age distribution in dental patients with respiratory disorders. X-axis represents the age group and Y-axis represents the frequency percentage of dental patients with respiratory disorders. Study shows the highest prevalence in age group was between 30-60 years with respiratory diseases and prevalence of 35.7% between 10-30 years (green), 42.9% between 30-60 years (light blue) and least prevalent age group was above 60 years (orange) with 21.4%
Graph 5: Bar graph representing the association of number of patients with respiratory disorders and the dental treatment done, X-axis represents the respiratory disorder, Y-axis represents the number of dental patients. Association analysis between respiratory disorder and dental treatment was done using chi-square test. Pearson chi-square value is 0.342 has shown that there is no statistical significance (P value >0.05) however extraction was the most prevalent procedure done in all respiratory disorders.
Graph 6: Bar graph represents the association between respiratory disorders and age distribution in patients with respiratory disorders, X-axis represents the respiratory disorders and Y-axis represents the number of patients with respiratory disorders. The association analysis was done using Pearson chi-square test revealed that there is no statistical significance of association between respiratory disorders and age (0.342, p value >0.05). However tuberculosis and asthma are the most prevalent respiratory disorders in 10-30 years and >60 years age groups.
Graph 7: Bar graph represents the association between respiratory disorders and gender in patients with respiratory disorders, X-axis represents respiratory disorder seen in relation to the gender of the patients and Y-axis represents the number of patients with respiratory disorder. Association analysis done using pearson chi-square reveals that there was no statistical significant association between respiratory disorders and gender (0.342, p value >0.05), however tuberculosis was most prevalent in females and Asthma in males.