



Research Article

EPIDEMIOLOGY OF RESPIRATORY PROBLEMS IN ASSOCIATION WITH VARIOUS RISK FACTORS: A CLINICAL STUDY AT ST. JOSEPH'S GENERAL HOSPITAL

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ABSTRACT

The aim of the study was to identify the epidemiology of respiratory problems and to assess their association with various risk factors in patients of St. Joseph's general hospital, Guntur, Andhra Pradesh. The study was conducted over a period of 8 months (July-2019 to February-2020) in 71 patients (both males and females) and the data was analyzed using EXCEL 2007 and SPSS version 6.0. The study was conducted throughout 3 seasons (Monsoon, autumn, winter) during which people are more prone to respiratory problems. Demographic information like the name, age, gender, address, and previous medical history was included. The risk factors like time of admission (month), location, age, gender, past medical history & other co-morbidities and social history were considered. The diagnosed pulmonary problems include Asthma, Bronchitis (acute, chronic & viral), COPD, Interstitial Lung Disease, LRTI, Lung Cancer, Pneumonia, Respiratory Failure, Tuberculosis, Tonsillitis and Shortness of Breath due to either Plural Effusion or Pulmonary Oedema. This study depicts the epidemiology of respiratory problems as Non-Guntur district (14.084%), Guntur urban (59.154%), Guntur rural (26.760%). This study shows the results as; patient with social history of tobacco and/or alcohol (10%), patients without any social history (90%), without any past medical history or other co-morbidities (51%), with some past medical history (49%), males (54.93%), females (45.07), July to October (50.7%), November to February (49.3%). And 61-to-70-year patients are at the top (23.94%) and 11 to 20 year patients are at the bottom (1.40%) of the distribution.

KEY WORDS: Clinical Study, Epidemiological Study, Respiratory Disorders, Respiratory Diseases.

INTRODUCTION

The aim of the study was to identify and assess the epidemiology of respiratory problems in St. Joseph's Hospital and the association of various risk factors with the medical condition.

Epidemiology is the study of distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems¹. Epidemiology was originally focused exclusively on epidemics of communicable diseases but was subsequently expanded to address endemic communicable diseases and non-communicable infectious diseases². By the middle of the 20th Century, additional epidemiologic methods had been developed and applied to chronic diseases, injuries, birth defects, maternal-child health, occupational health, and environmental health. Epidemiology is also used to search for determinants, which are the causes and other factors that influence the occurrence of disease and other health-related events. Determinant is any factor, whether event, or other definable entity, that brings about a change in a health condition or other defined characteristics³.

Respiratory problems are leading causes of death and disability in the world. Respiratory diseases impose an immense worldwide health burden. Five of these diseases (COPD, Asthma, acute lower respiratory tract infections, tuberculosis and lung cancer) are among most common causes of severe illness and death worldwide^{4,5}.

MATERIALS AND METHODS

Place of Study: The study was conducted at St. Joseph's general hospital, Guntur, Andhra Pradesh, India.

Inclusive Criteria

- Male and female patients of all ages.
- Patients with any respiratory problem
- Patients who had admitted as In-Patients in pulmonology department, at St. Joseph's general hospital, Guntur.

Exclusion Criteria

Respiratory illness due to Trauma of the chest and ribs

Study Duration: 8 months (July to February)

Source of Data: The source of data is from patient case sheets from wards, direct patient interview and archived patient data from record room. Data collected include name, age, gender and address of the patient, current disease diagnosed, past medical history and social history of the patient.

Risk Factors Considered Are

1. Age (>1 year)
2. Gender (male and female)
3. Location where the patient is living (in the city and in the village)
4. Past medical history (respiratory problems and other co-morbidities)

Past Respiratory Problems:

Asthma, Chronic obstructive lung disease (COPD), Pneumonia, Tuberculosis, Lower Respiratory Tract Infection (LRTI), Pneumo Thorax, Malignant Lung, Sinusitis.

Non-respiratory co-morbidities: Hypertension (HTN), diabetes mellitus type 2(DM2),Hypothyroidism.

5. Social history (smoking, alcohol & tobacco snoring)

6. Month of admission (July to October- Monsoon and November to February- winter)

Ethical Issues: Institutional ethical committee (IEC) approval was obtained prior to the initiation of the study

RESULTS

In these 8 months of study conducted at St. Joseph’s general hospital, 71 in-patients have been diagnosed with respiratory problems. Out of this 71 patients 39(55%) were male and 32(45%) were female. A general statistics is done on age

distribution of patients using SPSS version 16.0. The mean age of the patients was found to be 54.800 (with a standard deviation of ±27.758).It was observed that males of 71-80 years of age and females of 61-70 years of age have high prevalence of respiratory problems, whereas, the least prevalence was observed in patients of < 1 year and 11-20 years of age. The distribution of respiratory problems at various locations was observed, and it was noted that patients with respiratory problems were more from Guntur city (59%), those from rural area of guntur district has intermediate percentage of cases (27%) and least cases were from areas of non guntur district (14%).When social history of the patients was observed, it was found that majority of the patients (90%) do not have any social history of tobacco or alcohol consumption. When it comes to diagnosis, majority of the patients under study are diagnosed with acute lower respiratory tract infection (LRTI)[28.17%]. And it was also found that patients without any previous history of respiratory problems were more (53.52%) than those with previous history of respiratory problems (46.48%).

Table 1: Age and gender distribution of respiratory problems

Age	MALE	FEMALE	Total
<1	1	1	3%
1 TO 10	6	2	11%
11 TO 20	1	0	1%
21 TO 30	1	2	4%
31 TO 40	3	3	8%
41 TO 50	4	1	7%
51 TO 60	1	2	4%
61 TO 70	6	11	24%
71 TO 80	9	6	21%
81 TO 90	7	4	15%

Table 2: Area wise distribution of respiratory problems during different months

Location	JUL-OCT (MONSOON & AUTUMN)	NOV-FEB (WINTER)	PERCENTAGE
NON GNT	6	4	14%
GNT URBAN	21	21	59%
GUNTUR RURAL	9	10	27%
TOTAL	36	35	100%

Table 3: Distribution of respiratory problems in association with social history

SOCIAL HISTORY	NO. OF PATIENTS	PERCENTAGE OF PATIENTS
SMOKING	4	6%
ALCOHOL	0	0%
BOTH	3	4%
TOBACCO SNORING	0	0%
NO SOCIAL RISK FACTORS	64	90%
TOTAL	71	100%

Table 4: Distribution of various respiratory problems among the patients under study

DIAGNOSIS	WITH PREVIOUS HISTORY OF RESPIRATORY PROBLEMS	WITHOUT PREVIOUS HISTORY OF RESPIRATORY PROBLEMS	TOTAL	PERCENT TOTAL
ASTHMA	4	1	5	7%
ACUTE BRONCHITIS	0	5	5	7%
CHRONIC BRONCHITIS	1	0	1	1%
VIRAL BRONCHITIS	0	1	1	1%
COPD	8	6	14	20%
ILD	1	0	1	1%
LRTI	7	20	27	38%
LUNG CANCER	1	0	1	1%
PNEUMONIA	1	2	3	4%
RESPIRATORY FAILURE TYPE 2	4	3	7	10%
TB	2	0	2	3%
TONSILITIS	1	0	1	1%
SOB DUE TO PLEURAL EFFUSION	2	0	2	3%

SOB DUE TO PULMONARY EDEMA	1	0	1	1%
TOTAL	33	38	71	
PERCENTAGE	46%	54%		100%

Table 5: Respiratory problems in association with medical co-morbidities

MEDICAL HISTORY	PATIENTS	PERCENTAGE
WITHOUT ANY RISK FACTORS OF HTN/DM2/HYPOTHYROIDISM	36	51%
HTN ALONE	6	8%
DM2 ALONE	4	6%
HYPOTHYROIDISM ALONE	2	3%
HTN + DM2	19	27%
HTN + HYPOTHYROIDISM	3	4%
DM2 AND HYPOTHYROIDISM	1	1%
TOTAL	71	100%

Table 6: Effect of season on no. of in-patient admissions

DURATION	SEASON	NO. OF IN-PATIENTS WITH RESPIRATORY PROBLEMS	PERCENTAGE
JULY-OCT	MONSOON & AUTUMN	36	51%
NOV-FEB	Winter	35	49%

Table 7: comparison and analysis of medical history among patients without any social history

MEDICAL HISTORY	WITH ANY H/O RESPIRATORY PROBLEMS	WITHOUT ANY H/O RESPIRATORY PROBLEMS	TOTAL
WITH NON-RESPIRATORY CO-MORBIDITIES	18	18	36(56.2%)
WITHOUT ANY NON-RESPIRATORY CO-MORBIDITIES	11	17	28(43.7%)
TOTAL	29(45.3%)	35(54.6%)	64 (patients without any social history but with some medical history)

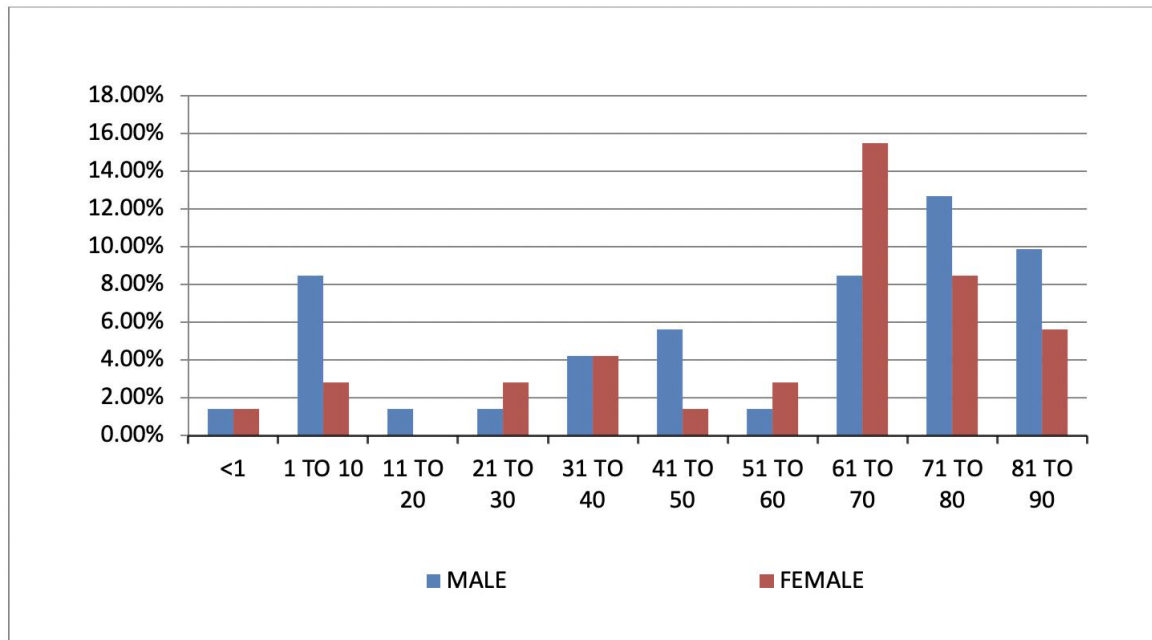


Figure 1: Age and gender distribution among patients with respiratory problems

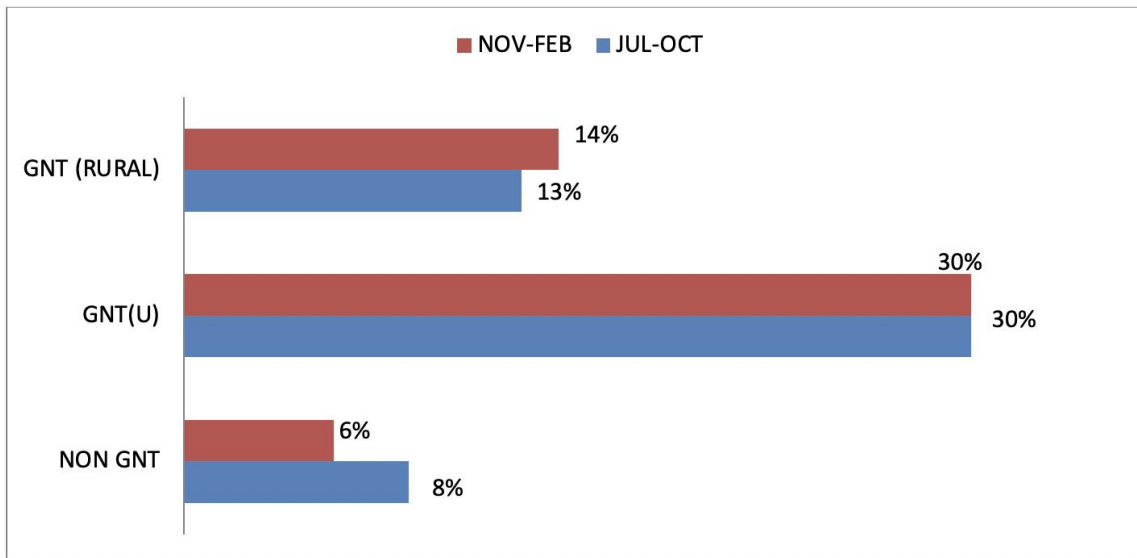


Figure 2: Area wise distribution of patients with respiratory problems

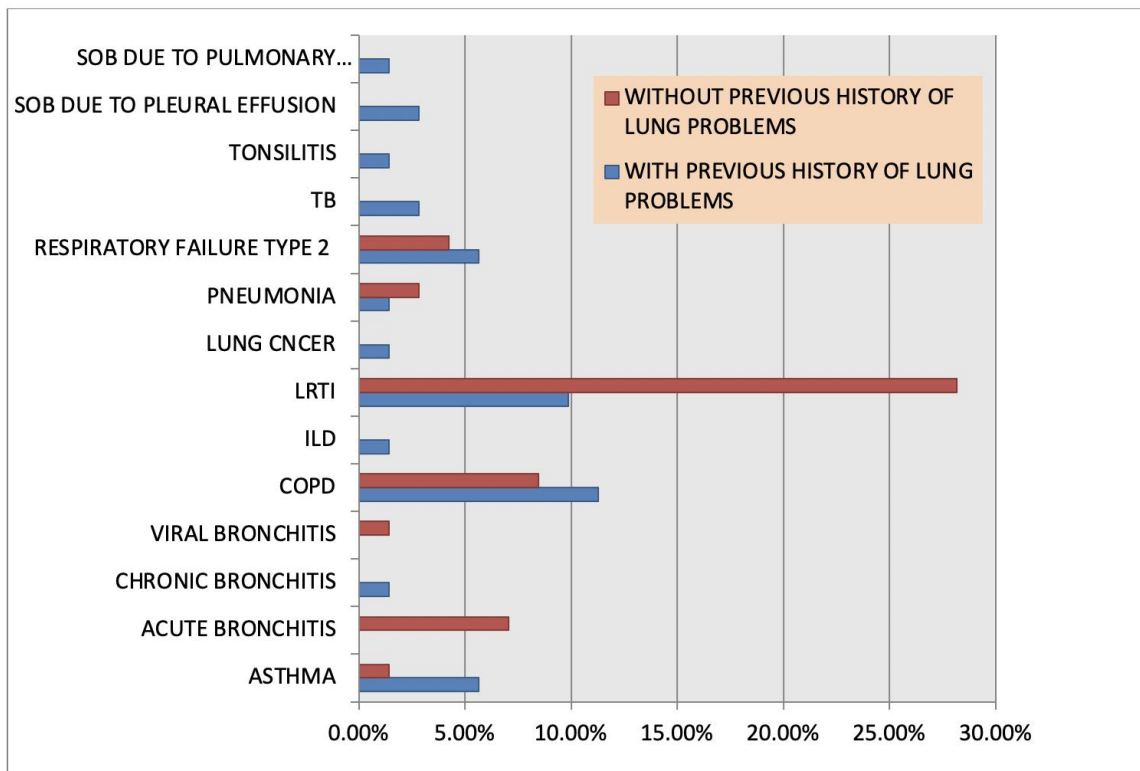


Figure 3: distribution of patients with various respiratory problems in association with past medical history

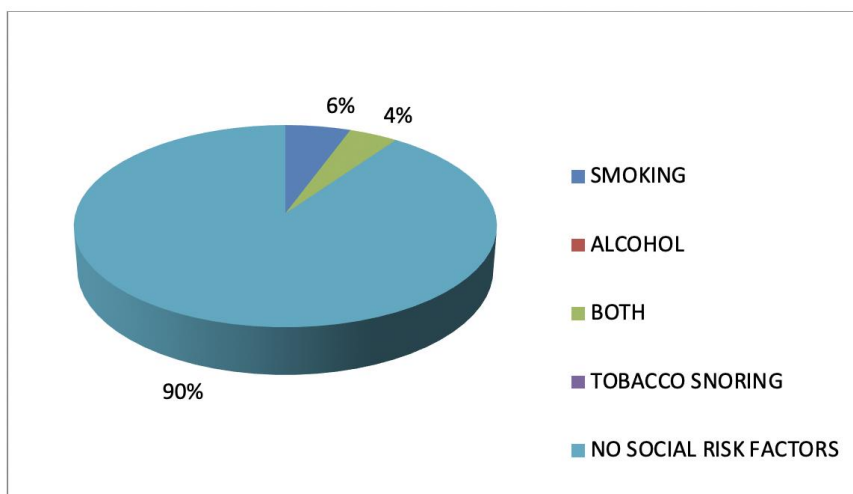


Figure 4: Social habits among patients with respiratory problems

DISCUSSION

A total of 71 cases were collected from in-patient wards of pulmonology department at St. Joseph's general hospital. Highest bar of the respiratory problems was observed in 61-70 years for females (15.49%) and from there the height of the bar declined gradually, as per the bar graph (Fig.1). Whereas for males the peak was at 71-80 years (12.68%). This (Table 1 & Fig.1) shows that though the distribution was not regular, majority of the patients are elders (> 60 years) and the mean age of the patients was found to be 54.8 (± 27.758). Many experts state that there are many age-associated changes in the respiratory and pulmonary system. According to them, the size of the thoracic cavity decreases with age, limiting lung volumes and altering the muscles that aid in respiration. Muscle function on a cellular level is less efficient and has decreased reserve. Due to some anatomic changes and muscle atrophy, cough strength is reduced in the elderly population and also the clearance of particles from the lung through the mucociliary elevator is negatively impacted and associated with ciliary dysfunction. Many complex changes in immunity occur with aging that increases the susceptibility to various infections. COPD has the highest prevalence in the elderly and deserves special consideration in regard to treatment in fragile (elderly) population⁶. In our study more patients were from areas within the Guntur city (59%). Also, the patients of rural areas were not exempted from respiratory problems in our study; more than ¼ patients under study (27%) were from non-urban areas of Guntur. In a cross-sectional study conducted by Pragti Chhabra and team⁷, house-to-house survey was conducted in an urban upper middle-class locality. In which they found that all the symptoms [chronic cough, chronic phlegm and dyspnea] increased with age ($P < 0.05$). No significant difference was observed in these symptoms between males and females⁷.

Though most of the patients in our study were without any social habit (smoking & snoring tobacco or alcoholic consumption) they were diagnosed with one or the other respiratory problems (90%). Among the other (10%) patients, majority (6%) were only smokers whereas others (4%) were having habit of both smoking and alcohol consumption (Table.3 & Figure.4). In this study the previous medical history of patients was categorized into pulmonary (respiratory) and other co-morbidities. Table 7 shows the medical history of patients who are without any social history of smoking and/or alcohol consumption. It shows that, 45.3% patients were with previous history of respiratory problems and 56.2% patients were with history of non-respiratory co-

morbidities. It also shows that 28.125% of patients were with history of both respiratory and non-respiratory co-morbidities and 26.5% were without any previous medical history. According to a review conducted in 2001, the reported smokers: nonsmokers ratios varied from 61.6% to 91.1% in 10 different populations⁸. From Table 4 & Figure 3 it is clear that, the percentage of patients without previous history of pulmonary diseases is more (53.52%) than that of patients with previous history of pulmonary diseases (46.48%). Among the non-pulmonary co-morbidities majority of the patients were without any co-morbidity of HTN/DM2/Hypothyroidism (36%) and 19% patients were with both HTN and DM2, 6% were with HTN alone, 4% with DM2 alone, 3% with HTN + Hypothyroidism, 2% with Hypothyroidism alone and 1% patients were with DM2 and Hypothyroidism (Table 5). When the medical history data of the patients was analyzed with SPSS version 6.0, it showed no significant difference in both respiratory history and history of co-morbidities was present between male and female ($P > 0.05$). People with type 2 diabetes more frequently reported grade 2 dyspnoea and chronic cough/phlegm than the general population of the same age, although presenting similar smoking habits⁹.

Among the diagnosed respiratory problems, Acute Lower Respiratory Tract Infection [LRTI] was seen in majority of patients (38%), followed by COPD (20%) and type 2 respiratory failure (10%). Further distribution of patients with other respiratory problems can be known through Table 4 And Figure 3. In this study seasonal variation was also taken into consideration and was observed for its influence on the rate of admission of patients at pulmonology department. Climate change represents a massive threat to respiratory health: 1) by directly promoting or aggravating respiratory diseases; or 2) by increasing exposure to risk factors for respiratory diseases. According to a review by Gennaro D'Amato¹⁰, climate change increases the amount of pollen and allergen produced by each plant, mould proliferation and the concentrations of outdoor ozone and particulate matter at ground level. The main diseases of concern during this climate change are asthma, rhinosinusitis, chronic obstructive pulmonary disease (COPD) and respiratory tract infections. Groups at higher risk of climate change effects include individuals with pre-existing cardiopulmonary diseases or elderly individuals¹⁰. In our study, the range of months from July to October was considered as one set (Monsoon & Autumn) and duration from December to February was taken as another set (winter). The viral infections are high in monsoons due to damp and humid weather, which is a perfect environment for bacterial

growth. In the current study it was observed that there is no much difference in the number of in-patient admissions in between both sets/seasons. In monsoon & autumn one extra case (51%) has been observed than in winter (49%) which can be clearly observed through Table 6.

CONCLUSION

This epidemiological study shows that respiratory problems are becoming the major concern in the human health. Majority of patients in our study were elderly. This shows that age has a major effect on the occurrence of respiratory problems and there are many studies to support this statement. Though most of the patients in our study were from the urban area, the cases from the rural area are not negligibly less. The results of our study show that the effect of the locality of living, on prevalence of respiratory problems, is more prominent than seasonal effect. No significant difference ($P>0.05$) was observed in medical co-morbidities between male and female. This shows that gender of the patient doesn't have significant effect on prevalence of the respiratory problems in association with co-morbidities. Although the previous history of pulmonary problems and non-pulmonary co-morbidities may not be solely responsible for developing a respiratory disease, they may exacerbate the condition/disease. The results also show that, among the patients without any smoking history, majority of patients were with the history of both respiratory and non-respiratory co-morbidities. From the overall study, it can be concluded that, presence of non-respiratory co-morbidities (HTN, DM2, and Hypothyroidism) acts as major risk factor and has more influence on prevalence of respiratory problems. Though the results of this study are not conclusive, many studies have been conducted on the effect of co-morbidities on respiratory problems and most of them show that the presence of co-morbidities influences the occurrence of respiratory problems.

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