RESEARCH ARTICLE

A SURVEY ON RESPIRATORY TRACT DISEASES ASSOCIATED WITH ALLERGIES

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ARTICLE INFO	ABSTRACT
	Objectives: To study the epidemiological incidence, assess various allergens, symptoms & analyze prescribing pattern of respiratory tract diseases associated with allergies. **Methodology:** Questionnaire based survey was conducted in pulmonology department, for 4 months includingall outpatients& excluding inpatients& children below 10 yrs. **Result and Discussion**: Out of 72 patients included, 40.27% were males&61.42% were females. Respiratory problem was more in age group 20 to 30 yrs. 47.22% .The distribution of disease was more in rural area& the incidence was more during rainy season. Polluted air accounts 84.72%of allergens & the common symptom was cough & sputum (62.85%).The most commonly prescribed drugs were corticosteroids & β-agonist. In combination therapy long acting β-agonist & corticosteroids was prescribed. **Conclusion:** The study shows that respiratory tract diseases associated with allergies are common today, where environmental pollution has a great role to play. The study was beneficial to attain knowledge about various allergens, symptoms as well as current therapy associated with respiratory tract diseases in the community.

INTRODUCTION

The respiratory tract is the most common site of infection by pathogens. Respiratory diseases, any of the diseases and disorders that affect human respiration. Diseases of the respiratory system may affect any of the structures and organs that have to do with breathing, including the nasal cavities, the pharynx (or throat), the larynx, the trachea (or windpipe), the bronchi and bronchioles, the tissues of the lungs, and the respiratory muscles of the chest cage. (http:\\www.britannica. com) Each year, children acquire between two and five upper respiratory tract infections and adults acquire one or two infections. The respiratory tract is the site of an exceptionally large range of disorders for three main reasons:

- It is exposed to direct contact with the environment and therefore may be affected by inhaled organisms, dusts or gases.
- It possesses a large network of capillaries through which the entire output-of the heart has to pass, which means that diseases that affect the small blood vessels are to affect the lung,

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- It may be the site of sensitivity or allergic pneumonia that may profoundly affect function (http:\\en.www.wikipedia. org).

An infection of this type is normally further classified as an upper respiratory tract infection (URI or URTI) or a lower respiratory tract infection (LRI or LRTI)

Upper respiratory tract infection

Although some disagreement exists on the exact boundary between the upper and lower respiratory tracts, the upper respiratory tract is generally considered to be the airway above the glottis or vocal cords. This includes the nose, sinuses, pharynx, and larynx.

Common upper respiratory tract infections include:

- The common cold
- Tonsillitis (infection of the tonsils and tissues at the back of the throat)
- Sinusitis (infection of the sinuses)
- Laryngitis (infection of the larynx, or voice box)
- Headaches
- Stuffed or runny nose

- Sore throat
- Sneezing
- Muscle aches and pain

The symptoms of an upper respiratory tract infection usually pass within one to two weeks.

Lower respiratory tract infection

The lower respiratory tract consists of the trachea (wind pipe), bronchial tubes, the bronchioles, and the lungs. Lower respiratory tract infections are generally more serious than upper respiratory infections. LRIs are the leading cause of death among all infectious diseases.

Common lower RTIs include:

- Flu (this can affect either the upper or lower respiratory tract)
- Bronchitis (infection of the airways)
- Pneumonia (infection of the lungs)
- Bronchiolitis (an infection of the small airways that affects babies and children younger than two)
- Tuberculosis (persistent bacterial infection of the lungs)

As with an upper respiratory tract infection, the main symptom of a lower respiratory tract infection is a cough, although it is usually more severe and more productive (bringing up phlegm and mucus). Sometimes the mucus is blood-stained.

Other symptoms of a lower respiratory tract infection include:

- A tight feeling in your chest
- Breathlessness
- Wheezing
- Sore throat
- Fever and chills
- Headaches
- Blocked nose and sinuses

Epidemiology

- However, data from WHO from 88countries representing one fourth of the worlds population indicate that there are over 6,66,000 deaths from ARI every year
- The mortality rates per 100,000 population are high in Africa (103.2) and Asia (87.2) compared to North America (30.5). In developing countries, the rates are considerably higher among children under the age of one year followed by those in 1-4 years age group.
- This is uniformly high in children residing in Africa and Asia, it is highest in the 1-4 years age group
- ARI accounts for 14.3% of deaths during infancy and 15.9% of deaths between 1-5 years of age. In pediatric age group, 20-24% of deaths are reportedly attributable to acute lower respiratory infections.
- Since the mortality rate from ARI in our country is expected to be as high that of most Asian countries.
- ARI associated case fatality rates which among hospitalised patients is as high as 5-10%.

- Pneumonia alone accounts for 75% of deaths from ARI.
- On an average, a child in urban area during first five years of life may suffer from 5-8 episodes of ARI per year. In rural areas the reported incidence per child is lower (1-3 episodes per year).

While annual incidence of pneumonia among children below five years of age in the U.S.A. is 30-40 per 1000 children, the rate in rural Punjab has been 94. (http:\\health central.com)

Preventive measures

- Frequent hand washing remains the most important preventive measure for most respiratory tract infections.
- Simple measures, such as covering the mouth and nose while sneezing, can decrease the risk of transmission of infectious agents. No study has ever shown that prophylactic antibiotics can prevent the development of bacterial infection.
- Vitamin C is not recommended for prevention of respiratory tract infection in the general community. The prophylactic Vitamin C may reduce the incidence of colds by 50% & shorten the duration of colds by 8% in adults.
- The trivalent inactivated intramuscular influenza vaccine is one of the few cost saving interventions in medicine today. It results in a 30% to 50% reduction of respiratory illness.

The greatest impact of using the 23- valent pneumococcal polysaccharide vaccine has been on preventing the pneumonia and meningitis in older adults. The chemo prophylaxis should not be considered as a substitute for vaccination.

General principles

- Strengthening partnership among health care systems and other sectors of society.
- Strengthening research on primary and secondary prevention interventions of CRDs.
- Identifying research priorities, which should include in addition to prevention strategies, therapeutic regimens, traditional medicine and alternative therapeutic approaches?
- Based on the global strategy for the prevention and control of NCDs, the objectives of the WHO strategy on CRDs are:
- Better surveillance to map the magnitude of Chronic Respiratory Diseases and analyse their determinants with particular reference to poor and disadvantaged populations, and to monitor future trends.
- Primary prevention: Primary prevention of CRDs requires the reduction or avoidance of personal exposure to common risk factors, to be started during pregnancy and childhood. Avoidance of direct and indirect exposure to tobacco smoke is of primary importance not only for healthier lungs, but as a preventative measure for the other 3 priority NCDs (cardio vascular disease, cancer, and diabetes) identified in the Global Strategy for NCD prevention and control. Other shared risk factors that should be addressed include low birth weight. Poor nutrition, acute respiratory infections of early childhood, indoor and outdoor air pollutants, and occupational risk factors.

- **Secondary and tertiary prevention:** Early detection of occupational asthma is vital to prevent further progression and to ensure cost- effective management. Programmes for early detection of COPD have been suggested but their cost- effectiveness has yet to be fully evaluated. Although long term decline in lung function may not be reversible, effective management include smoking cessation, pulmonary rehabilitation and reduction of personal exposure to noxious particles and gases reduce symptoms, improve quality of life, and increase physical fitness. Further, evidence indicators influenza vaccination is accost effective interventions for patients with COPD.

Asthma, although not curable, is a treatable disease with preventable morbidity. It is also a known risk factor for COPD. Secondary and tertiary prevention involves avoidance of allergens and non- specific triggers. Optimal pharmacological treatment, including the use of anti-inflammatory medication, has been shown to be cost- effective in controlling asthma, preventing the development of chronic symptoms, and reducing mortality. (Singh *et al.*, 2011)

Literature review

- Singh *et al.* (2011) conducted a survey on Respiratory tract problems associated with allergies in Punjab region. The survey was based on the questionnaire method
- MadeshwaranRamvikas *et al.* (2010) carried out a survey to investigate the self -medication and non-doctor prescribing of drugs used for respiratory tract infection in developing countries. The study was based on the questionnaire method
- AvijitMajumder *et al.* (2003) The study was carried out to investigate urban rural areas of Jharkhand to have a comprehensive idea of asthmatic of the state
- Bipinprajapati *et al.* (2011) conducted a study on acute respiratory tract infection in five children
- Fnja *et al.* (2003) investigated the airway infections in infancy, the presence of allergy and asthma in school age children

Objectives

- To study the epidemiological incidence of respiratory tract diseases associated with allergies.
- To assess the respiratory health by questionnaire survey.
- To investigate the various allergen of respiratory tract diseases.
- To assess the various symptoms associated with respiratory tract diseases.
- To observe various types of respiratory tract diseases.
- To analyse the medication trend and present prescribing patterns among the participants.

MATERIALS AND METHODS

Study period: 4 months

Study design: Questionnaire method

Studypopulation: 72 subjects

Literature survey: an extensive literature survey was done on various Respiratory tract diseases and its control, prescription patterns, evaluation of severity of respiratory tract diseases, factors accounting for respiratory diseases variability etc. The various sources of literature include journal like lung India, BMC pulmonary medicine, pediatricpulmonology, primary care respiratory journal etc.

Study criteria:

Inclusion criteria: Outpatients who were coming for consultation in pulmonology department.

Exclusion criteria:

- Inpatients
- Children below 10 yrs.

RESULTS AND DISCUSSION

The study was carried out at Paalana Institute of Medical Sciences over a period of 5 months from Sep 2013 to Jan 2014. During the entire period, a total of 72 patients were included of these, 40.27% (n=29) were males as compared to 61.42% (n=43) were female. Most studies from India and other countries have observed a male preponderance for the occurrence of COPD. The difference is attributed to the differential rates of smoking and occupational exposure between the two genders. (Singh *et al.*, 2011) (Figure 1, Table 1) Gender distribution: Table: 1
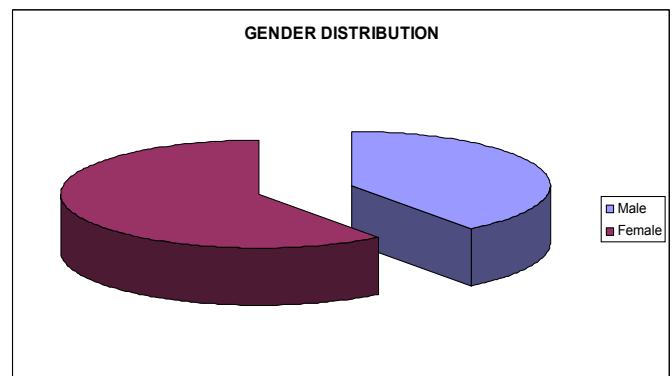

Figure 1.

In the present study respiratory problem is more in the age group 20 to 30 year is 47.22%(n=34) .Similar studies conducted by Singh *et al.*, 2011 revealed that incidence of respiratory tract diseases where being between 21 to 30 years. Some studies have observed a relationship between acute lower respiratory tract infection in the first two years of life and chronic respiratory disease in later life. (Singh *et al.*, 2011; Avijit Majumder *et al.*, 2003). (Figure 2, Table 2)

Age distribution: Table: 2

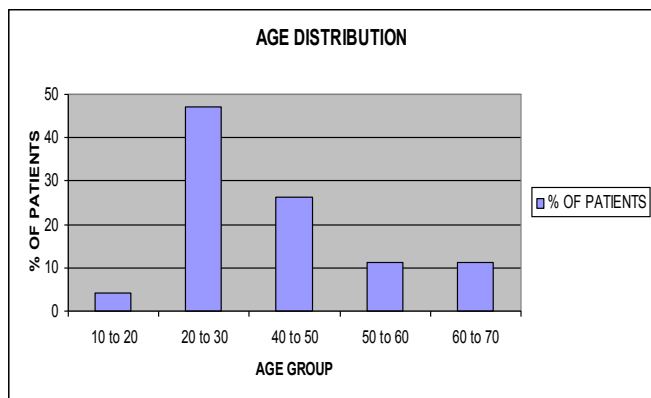| Age group	Number of patients (n=72)	Percentage (%)
10 to 20	3	4.08%
20 to 30	34	47.22%
40 to 50	19	26.38%
50 to 60	8	11.11%
60 to 70	8	11.11%

Figure 2.

During the study period, distribution of respiratory tract problem is more in rural area 60% (n=42) and 41.66 %(n=30) in urban area. Similar studies conducted by Singh *et al.* 2011 reported that respiratory tract problems more in urban area. (Figure 3, Table 3)

Incidence of respiratory tract problems according to location: Table 3

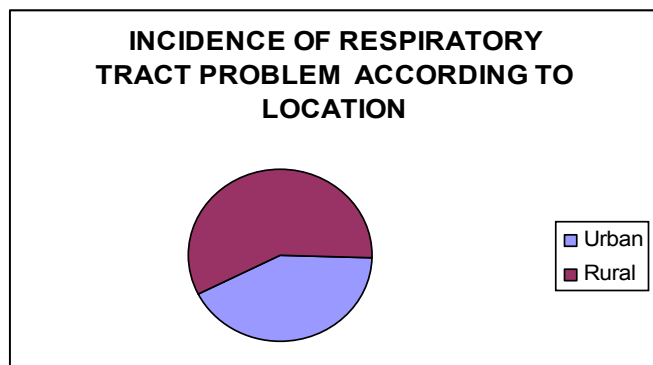| Location	Number of patients (n=72)	Percentage (%)
Urban	30	41.66%
Rural	42	60%

Figure 3.

The study on the incidence respiratory tract problems in season were also screened among these more cases were identified in Rainy season 44.44%, (n=32) followed by winter season 34.27% (n=25). (Figure 4, Table 4)

Incidence of respiratory tract problems according to season: Table: 4

Season	Number of participants	Percentage (%)
Winter	25	34.72%
Rainy	32	44.44%
Summer	15	20.83%

The present study revealed that various type of allergens which are responsible for the respiratory tract problem, in which Polluted air accounted by 84.72 %(n=61), Dust78.57% (n=55), Climate 72.85% (n=51) etc.
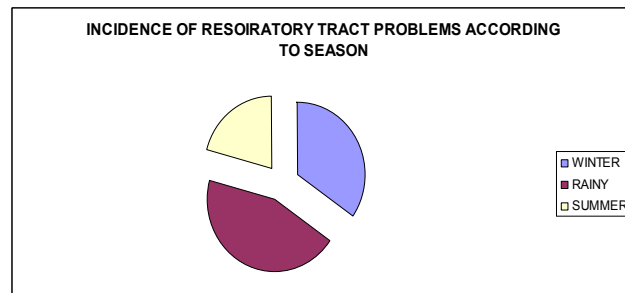

Figure 4.

Similar studies conducted by Kabila B *et al* in 2011 reported that more predominant risk factor was found to be the dust, and then followed by change in climate. (Avijit Majumder *et al.*, 2003) (Figure 5, Table 5)

Incidence of causative allergens of respiratory tract problems: Table: 5

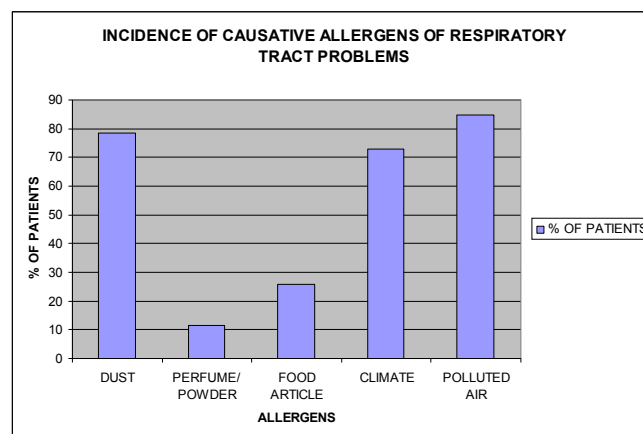| Allergens	Number of participants (n=72)	Percentage (%)
Dust	55	78.57%
Perfume/ Powder	8	11.42%
Food Article	10	25.71%
Climate	51	72.85%
Polluted Air	61	84.72%

Figure 5.

In the present study about 62.85% (n=44) of the patients came with the respiratory symptoms of cough and sputum which is then followed by Shortness of breath 57.14% (n=40) and wheezing 41.66% (n=30). (Figure 6, Table 6)

Incidence of respiratory tract problems according to symptoms: Table: 6

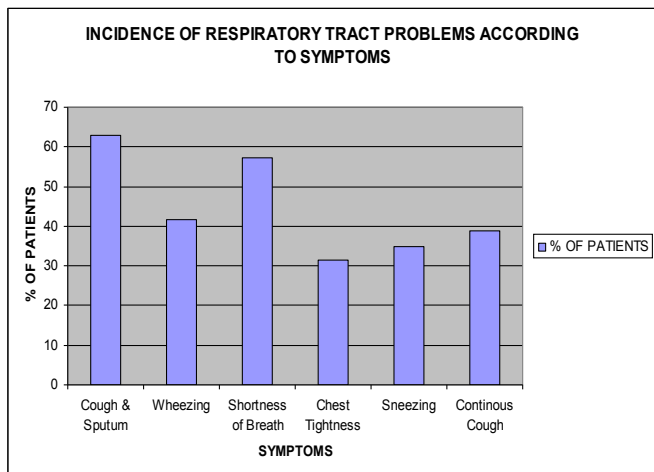| Symptoms	Number of patients (n=72)	Percentage (%)
Cough & sputum	44	62.85%
Wheezing	30	41.66%
Shortness of breath	40	57.14%
Chest tightness	22	31.425
Sneezing	25	34.72%
Continuous cough	28	38.8%

Figure 6.

Patients were categorised in to various types of respiratory tract diseases such as Asthma 59.72% (n=43), Bronchitis 23.61% (n=17), COPD 16.66 % (n=12). (Figure 7, Table 7)

Types of respiratory diseases: Table 7

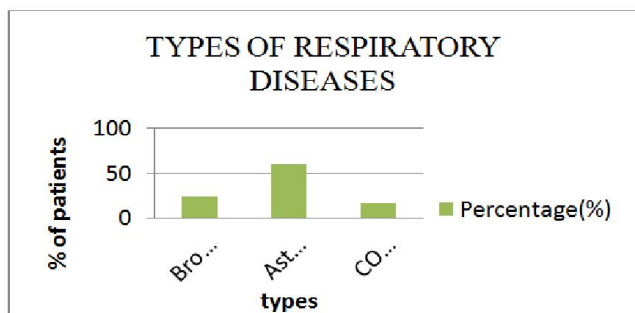| Types	Number of participants (n=72)	Percentage (%)
Bronchitis	17	23.61
Asthma	43	59.72
COPD	12	16.66

Figure 7.

For the purpose of analysing the prescription pattern trend among the participants shows that self-medication is less 22.22% (n=16) as compared to registered medical practitioner 77.77% (n=56). Study conducted by Kabila *et al* in 2011 revealed that self-medication pattern is more commonly used in respiratory tract problem as compared to registered medical practitioners. (Avijit Majumder *et al.*, 2003) (Figure 8, Table 8)

Medication trend in participants suffering from RTP: Table 8

Medication trend	Number of participants (n=72)	Percentage (%)
Self -medication	16	22.22
Registered medical practitioner	56	77.77

Overall drug therapy used in respiratory tract diseases showed that most commonly prescribed drugs were corticosteroids and β- agonist which were in single or combination therapy, In combination therapy Long acting β- agonist and Corticosteroids were prescribed 61.11%(n=44).
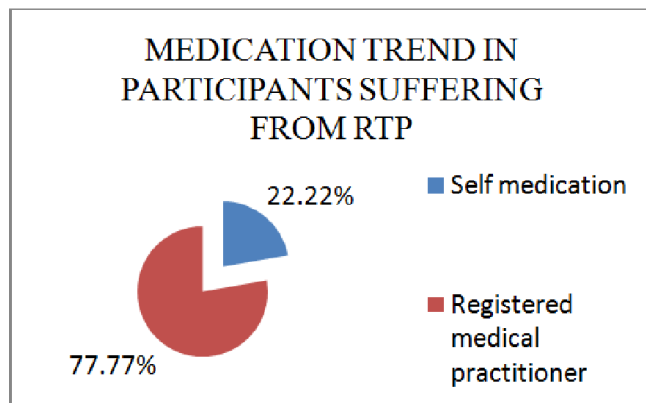

Figure 8.

Other drugs prescribed were Methyl xanthine 94.44% (n=68) and Antihistamines 90.27% (n=68), Leukotriene Antagonists 90.27% (n=65) etc. (Figure 9, Table 9)

Commonly prescribed drugs: Table 9

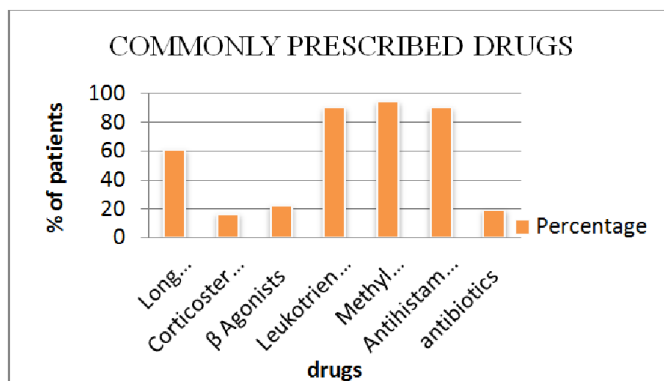| Drugs	Number of participants (n=72)	Percentage (%)
Long acting β agonists & corticosteroids	44	61.11
Corticosteroids	12	16.66
β Agonists	16	22.22
Leukotriene antagonists	65	90.27
Methyl Xanthines	68	94.44
Antihistamines	68	90.27
antibiotics	14	19.44

Figure 9.

Conclusion

The present study revealed that, among 72 cases, females (61.42%) are more prone for the occurrence of respiratory diseases as compared to male (40.27%).

- Respiratory tract diseases are more prevalent in patients aged between 20-30 years (47.22%).
- During the study period, majority of the respiratory tract diseases are found in rural area (60%) as that of urban area (41.66%).
- Among the population the incidence of respiratory tract diseases are high in Rainy season (44.44%).

- Respiratory tract allergies are more common today. According the study polluted air is the predominant risk factor (84.72%) for the respiratory tract problems.
- The major symptoms associated with respiratory tract diseases are cough & sputum (62.85%) followed by shortness of breath (57.14%).
- Among the participants, most of them are diagnosed as Asthma (59.72%), followed by Bronchitis (23.61%).
- Over all drug therapy among participates showed that majority of them underwent Methylxanthines 94.44% (n=68) combination of long acting β-agonist and corticosteroids (61.11%) followed by corticosteroids or β-agonist alone. The present study shows a very clear picture that respiratory tract diseases associated with allergies are more common today, where environmental pollution has a great role to play. Teenagers are often the suffers. Present study is more beneficial to attain knowledge about various allergens, symptoms as well as current therapy associated with respiratory tract diseases in the medical community.

Acknowledgement

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