



TO STUDY THE SEASONAL PATTERN OF HOSPITALISATION DUE TO RESPIRATORY DISEASES IN A TERTIARY CARE RURAL HOSPITAL

Medicine

Sai Aditya S.
Nayudu*

Senior Resident *Corresponding Author

Ravish M.
Kshatriya

Associate Professor

ABSTRACT

Introduction: Respiratory diseases include a broad range of diseases such as acute respiratory tract infections, pneumonia, obstructive lung diseases, occupational lung diseases, pleural disease and respiratory cancers. Seasonality is a periodic surge in disease incidence corresponding to seasons or other stereotyped calendar periods, is characteristic of many infectious diseases of public health importance.

Respiratory diseases constitute a major cause of morbidity and mortality worldwide. The top four respiratory diseases: Pneumonias, chronic obstructive pulmonary disease (COPD), tuberculosis, and lung cancer, are among the ten leading causes of death worldwide. Seasonal and periodical review of respiratory disease rate may help identify its risk factors and target interventions to prevent it. The knowledge of which may be used to improve the awareness of increased seasonal occurrence of disease and to develop an effective public health surveillance and programs.

Aims: To study seasonal pattern of hospitalization due to respiratory diseases in a tertiary care rural hospital by respiratory medicine department.

Methods and Material: A retrospective study of 6,884 patient records admitted in respiratory medicine ward over 7 years duration.

Conclusions: Respiratory diseases show a seasonal pattern which is reflected in the higher admission rates in certain months. Winter admissions were higher for COPD, Asthma and Pneumonia while Tuberculosis showed a bi modal distribution. These findings can help in effective allocation of resources and services based on seasonal demands.

KEYWORDS

seasonal pattern, respiratory diseases, admission, tertiary care rural hospital

INTRODUCTION

Respiratory diseases include a broad range of diseases such as acute respiratory infections, pneumonia, obstructive lung diseases, pleural disease and pneumoconiosis as well as respiratory cancers ^[1]. Individuals with respiratory disease can present to the emergency unit or room as acute illness or as exacerbation of chronic respiratory disease.

Seasonality is a periodic surge in disease incidence corresponding to seasons or other stereotyped calendar periods, is characteristic of many infectious diseases of public health importance. ^[2]

Seasonal and periodical review of respiratory disease rate may help identify its risk factors and target interventions to prevent it. The knowledge of which may be used to improve the awareness of increased seasonal occurrence of disease and to develop an effective public health surveillance and programs. ^[3] Respiratory diseases constitute a major cause of morbidity and mortality worldwide. The top four respiratory diseases: pneumonias, chronic obstructive pulmonary disease (COPD), tuberculosis, and lung cancer, are among the ten leading causes of death worldwide ^[4]. In reality, it is a complex mixture of ambient gases and environmental particulates to which pathogen containing droplets are added when respiratory secretions are coughed or sneezed out by others. No organ is as crucial and as vulnerable as is the lung. The lungs are the largest internal organ in the body and the only internal organ that is exposed constantly to the external environment. ^[5] Most of the disease burden in rural India is due to the respiratory disorders namely asthma, bronchitis and tuberculosis and pneumonia. In low resource settings these disease are mainly attributed with exposure to indoor pollution, solid cooking fuels, poor housing, low nutritional status and sanitary conditions.

Each year, 4 million people die prematurely from chronic respiratory diseases. ^[6] The most common lethal cancer in the world is lung cancer, which kills more than 1.4 million people each year. ^[7]

Effective measures to prevent them exist yet preventable chronic respiratory conditions remain under recognized and under diagnosed, inadequately treated and poorly prevented even in modern times. Availability and accessibility of drugs and devices are often poor; lack of resources for the diagnosis of chronic preventable respiratory conditions also significantly contributes to the problem.

Respiratory diseases are an enormous challenge to life, health and productive human activity. The prevention, cure and control of these

conditions and promotion of respiratory health must be the apex priorities in global decision making in the health sector.

AIM:

To study seasonal pattern of hospitalisation due to respiratory diseases in a tertiary care rural hospital.

OBJECTIVES:

To assess the year wise pattern of respiratory diseases.

To assess the month wise pattern of respiratory diseases.

MATERIALS AND METHODS

STUDY TYPE: Retrospective Study.

STUDY DURATION: 7 years.

INCLUSION CRITERIA

All patients admitted in respiratory medicine department from January 2011 to December 2017 were included in the study.

EXCLUSION CRITERIA

Patients shifted to Intensive care unit or shifted to wards of other department for further management.

RESULTS

A total of 6,884 (six thousand eight hundred and eighty four) were considered for the study out of which 4,718 patients were male i.e. 69% and 2,166 patients were female i.e. 39%. Mean age of the patients was 56 years and average hospital stay being 3.75 days. Regarding treatment outcomes, 96.25 % (6,626 patients) were discharged, 2.8 % (193 patients) took discharge against medical advice and 0.94% (65 patients) expired during the study period.

Table 1 : Number of total admissions year wise

Year	Admissions
2011	901
2012	885
2013	985
2014	874
2015	853
2016	1226
2017	1160
Total	6884

Table 2 : Number of admissions as per year & disease

	PTB	EPTB	LRTI	COPD	Asthma	Cancer
2011	144	44	196	252	64	52
2012	151	29	153	239	70	59
2013	165	52	175	274	90	63
2014	134	42	152	291	65	46
2015	170	73	108	317	65	36
2016	177	76	218	482	127	50
2017	142	49	210	463	96	64

The year 2016 saw the most number of admissions with 1226 patients. Maximum cases of LRTI/Pneumonia, COPD, Tuberculosis and Asthma were seen in the year 2016.

Regarding LRTI/Pneumonia, a total of 1,172 patients of Pneumonia patients were admitted over 7 years. Maximum admissions were seen in 2016 with 218 patients and the lowest were seen in 2015 with 108 patients. Admissions were more in the winter months.

Our results match with a Finnish study conducted over 20 year period. They reported increased hospitalizations in winter and decreased admissions in summer.^[8]

Regarding COPD, a total of 2,354 patients of COPD were admitted during the study period. Maximum admissions were seen in 2016 with 482 admissions and lowest were seen in 2012 with 239 patients. Admissions were seen more in the autumn and winter months i.e. September to February with a trough during the summer months.

According to a study published in International Journal of Chronic obstructive pulmonary disease^[9], more exacerbations were seen in winter months, which is similar to our study.

Regarding Asthma, a total of 531 patients were admitted over a period of 7 years. Maximum admissions were seen in the year 2016 with 113 admissions and 2011 recorded the lowest with 54 admissions. Most of the admissions were seen in the months of October to December while the summer months showed the least admissions.

In a study done in the United States^[10], more hospitalizations were recorded in winter months as compared to summer months which match our findings.

Regarding tuberculosis 1,646 patients were admitted in the seven year period. Maximum admissions were seen in 2016 with 253 admissions while 2014 saw only 176 admissions. The months of June and November saw the maximum number of admissions.

Our study showed bi modal pattern whereas in a study done in the United Kingdom, Tuberculosis showed a summer peak.^[11]

Regarding lung cancer, a total of 357 patients were admitted during the study period with maximum admissions in 2017 with 64 and lowest of 36 patients in 2015. Most of the admission were seen in winter months.

Other pulmonary diseases did not have significant number of patients to determine the seasonal pattern.

CONCLUSIONS

Respiratory diseases show a seasonal pattern which is reflected in the higher admission rates in certain months. Winter admissions were higher for COPD, Asthma, and Pneumonia while Tuberculosis showed a bi modal distribution; one peak is summer and another in winter. These findings can help in effective and equitable allocation of resources and services based on seasonal demands. More studies are needed to confirm findings. Periodic studies are required to monitor the pattern of diseases and plan accordingly.

REFERENCES:

1. World Health Organization (WHO). Key fact on respiratory diseases. c2008-01 (cited 2008 Dec 29) Available from <http://www.who.int>.
2. Dowell SF, Ho MS. Seasonality of infectious diseases and severe acute respiratory syndrome-what we don't know can hurt us. *The Lancet infectious diseases*. 2004 Nov 30;4(11):704-8.
3. Rios M, Garcia JM, Sanchez JA, Perez D. A statistical analysis of the seasonality in pulmonary tuberculosis. *European journal of epidemiology*. 2000 May 1;16(5):483-8.
4. R. Lozano, M. Naghavi, K. Foreman et al., "Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010," *The Lancet*, vol. 380, pp. 2095-2128, 2012.
5. Ferkol T, Schraufnagel D. The global burden of respiratory disease. *Annals of the American Thoracic Society*. 2014 Mar;11(3):404-6.

6. Global Alliance against Chronic Respiratory Disease. www.who.int/gard/news_events/1-3.GARD-06-07-K1.pdf
7. Ferlay J, Shin HR, Bray F, et al. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Int J Cancer* 2010;127:2893-2917
8. Säynäjäkangas P, Keistinen T, Tuuponen T. Seasonal fluctuations in hospitalisation for pneumonia in Finland. *International journal of circumpolar health*. 2001 Jan;60(1):34-40.
9. Donaldson GC, Wedzicha JA. The causes and consequences of seasonal variation in COPD exacerbations. *International journal of chronic obstructive pulmonary disease*. 2014;9:1101.
10. Weiss KB. Seasonal trends in US asthma hospitalizations and mortality. *Jama*. 1990 May 2;263(17):2323-8.
11. Douglas AS, Strachan DP, Maxwell JD. Seasonality of tuberculosis: the reverse of other respiratory diseases in the UK. *Thorax*. 1996 Sep 1;51(9):944-6