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RESEARCH ARTICLE

PREVALENCE OF TUBERCULOSIS AND RESPIRATORY DISEASES AMONG HEALTH CARE WORKERS IN A TERTIARY CARE HOSPITAL IN TAMIL NADU

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ABSTRACT

Introduction: Health care workers are occupationally vulnerable to many infectious diseases and accidents. Amongst the several infections, respiratory illnesses are more common, and also are responsible for sickness absenteeism and transmission of infections to patients. This study was done to estimate the prevalence of respiratory illnesses among nurses in a tertiary hospital.

Methodology: The study was done on 514 nurses in the tertiary care hospital. All the nursing students were included in the study. A physical examination was done and all of them were evaluated for respiratory and cardiac illnesses by Mass Miniature Radiography.

Results: It was observed that the overall prevalence of respiratory illnesses in this study was 7.6%. The prevalence of tuberculosis was 0.194%. This study also effectively evaluated the prevalence of pulmonary hypertension and cardiomegaly among the study participants.

Conclusion: The prevalence of respiratory illnesses is a serious public health problem. The preventive measures must be aimed at sensitization, screening during pre-placement examination, and periodic evaluation. Non pharmacological and non invasive preventive strategies must be used as a mandatory method of preventing this occupational hazard.

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INTRODUCTION

Respiratory infections are leading causes of acute infections in human beings. (Raina MacIntyre *et al*., 2017) The group of infections range from mild viral rhinitis to complex pneumonia and tuberculosis. Several organisms like Respiratory Syncytial Virus, to H. Influenza, pneumococcus and Mycobacteria are involved in the etiology of respiratory infections. Among these infections, tuberculosis continues to be a threat, despite several global, national, regional and local interventions. The emergence of other new infections like HIV, H1N1 and Ebola virus has increased the burden and challenges of respiratory illness and and its management. Though the vulnerable groups include infants, immunocompromised individuals, pregnant and lactating mothers, health care workers are also vulnerable due to occupational reasons. A systematic review of studies from low and middle income countries showed the annual risk of TB infection to be between 0.5% and 14.3% among the health care workers. (Iacopo Baussano *et al*., 2011) TB transmission occurs through droplet nuclei and it is more likely to occur from undetected or inadequately treated TB cases. In India, welfare of health care workers has only recently emerged to be of significant public health importance. There are few studies which have documented the burden of other respiratory illnesses among health care workers. However, tuberculosis has been long recognized as an occupational hazard in the developed countries, but, in low and middle income countries, it is yet to gain the momentum. Poor implementation of infection control measures, lack of periodic examinations, and inadequate sensitization of health care workers are the potential risk factors for TB infections among health care workers. (Sangini Punia *et al*., 2014) Knowledge on the burden of respiratory illness is of primary importance because of their front-line nature of work and the risk of transmitting the infections to other sick and vulnerable patients is also higher. (MacIntyre *et al*., 2014) This not only affects their quality of work, but also paves way for sickness absenteeism. (Komitova *et al*., 2011) This study will help understand the magnitude of the problem, and will also help generate hypothesis on preventive measures and personal protective measures to be employed to ensure the occupational safety of health care workers. A sound knowledge on the extent of the problem is a prerequisite to the development of sustainable strategies for alleviating the burden of TB among health care workers.

Objectives

To estimate the prevalence of tuberculosis and respiratory diseases among health care workers.

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MATERIALS AND METHODS

Study Setting

This study was carried out as a cross sectional study among the nursing students studying in the tertiary care hospital in Chennai. The data collection was carried for a period of one month.

Study participants

The hospital comprises of a total of 514 nurses in various departments including intensive care units and operation theatres. All the 514 nurses participated in the study.

Ethical Approval and informed consent

Institutional Ethics Committee approval was obtained and informed consent was obtained from the study participants prior to the commencement of data collection.

Data collection

All the consenting nurses were subjected to clinical history pertaining to allergy and asthma. Physical examination and mass miniature radiography were carried for the assessment of respiratory illness. A trained pulmonologist interpreted the mass miniature radiography.

Data analysis

Data was entered and analysed using Microsoft Excel spreadsheet. The prevalence of respiratory illnesses were computed as percentages.

RESULTS

This study was carried out among 514 nurses. Among the study participants, 2.3% were males while 97.7% (502) participants were females. The gender wise distribution of the study participants is given in Figure 1.

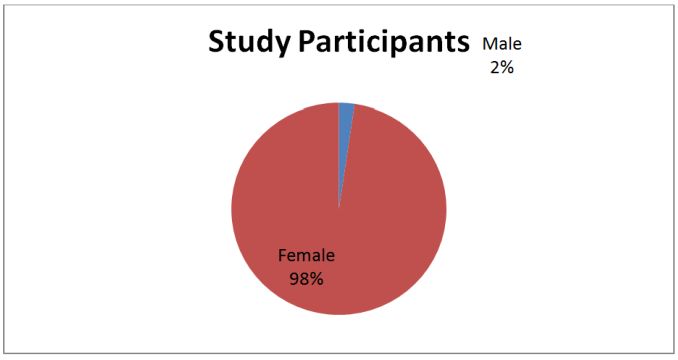

Figure 1. Gender wise distribution of the study participants

The prevalence of respiratory illnesses is given in Table 1. It was observed that out of 514 participants, 39 (7.6%) had atleast one respiratory disease. The highest prevalence was found with acute respiratory tract infection (2.3%) followed by allergic rhinitis and bronchial asthma (1.7%). The gender wise distribution of the diseases is given in figure 2. It was observed that only one male had acute respiratory tract infection and one male had allergic rhinitis. All the other diseases were present only among females.

Table 1. Prevalence of Respiratory illness among the study participants

S. No	Particulars	Frequency (n=514)	Percentage
1	Asthma	9	1.7
2	Allergic rhinitis	9	1.7
3	Pulmonary tuberculosis	1	0.194
4	Tuberculous Pleural effusion	2	0.4
5	Acute respiratory tract infection	12	2.3
6	Chronic bronchitis	2	0.4
7	Upper airway cough syndrome	2	0.4
8	Bronchiectasis	2	0.4
	Any one respiratory disease	39	7.6

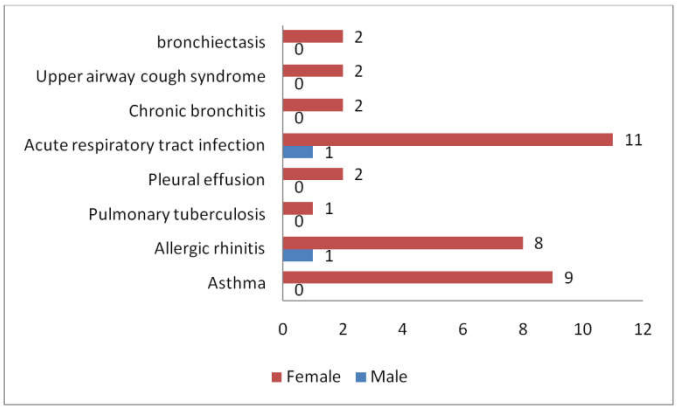

Figure 2. Gender wise distribution of respiratory illness

Among 514 study participants, 4partcipants less than one percent from total study participants reported with cardiovascular related cases. All female participants were reported for cardiovascular related cases. The particulars related to cardiovascular illnesses are given in Table 2.

Table 2. Prevalence of cardiovascular illnesses among the study participants

S. No.	Particulars	Frequency (n=514)	Percentage
1	Pulmonary hypertension	1	0.2
2	Rheumatic heart disease	1	0.2
3	Cardiomegaly	2	0.4

Among 514 study participants, 4 participants reported with congenital chest wall disease. Among participants reported with congenital chest wall disease all were female participants. The particulars regarding the prevalence of congenital chest wall diseases is given in Table 3.

Table 3. Congenital chest wall disease among study participants

S. No.	Disease	Frequency (n=4)	Percentage
1	Eventration of the diaphragm	1	0.2
2	Upper dorsal scoliosis	1	0.2
3	Cervical rib	2	0.4

DISCUSSION

Health care workers are potentially vulnerable to several occupational hazards, of which respiratory illnesses are one of them. This study highlighted the magnitude of the respiratory illnesses among health care workers in a tertiary care hospital. The prevalence of respiratory illness in the study population

was 7.6%. The prevalence of tuberculosis among the study participants was 0.194% (194 cases per 100,000 population). The risk of TB infection among health care workers is largely related to the exposure to unsuspected cases and also poor working conditions including ventilation. (Institute of Medicine (US) Committee on Regulating Occupational Exposure to Tuberculosis, 2001) This study also highlighted the burden of cardiovascular diseases and congenital chest wall diseases among the health care workers. It was observed that pulmonary hypertension was present among 0.2% of the study population. However, the causes for cardiac abnormalities were not explored in this study. Occupational hazards among nurses are a serious public health problem. The health care workforce is crucial for the country and nurses form an essential component. Among the several occupational hazards like needle stick injuries, musculoskeletal pains, excessive work load and job related stress and violence, vulnerability to infections are the highest among the nurses. It is essential for the health care institutions to implement non pharmacological approaches to prevent the transmission of respiratory infections from patients to health care workers and vice versa. (Yang Peng *et al*., 2017) The need for a comprehensive policy and national health programme to prevent the occupational hazards of health care workers is of prime importance as this will help in minimizing the sickness absenteeism among the health care workers and also indirectly improve the bed occupancy rates and minimize the risk of nosocomial infections, thereby minimizing the risk of antibiotic resistance. This will at large reduce the duration of hospital stay among the patients.

Conclusion

The risk of acute respiratory infections and tuberculosis among the nurses is highlighted in this study. This study reveals the need for non invasive and non pharmacological preventive approaches for nurses which will go a long way in minimizing the burden of respiratory infections among health care workers.

Limitations

This study has highlighted only the prevalence of respiratory illness. A time series analysis of the risk of respiratory illnesses over a period of one year will give a better quantification of the health risk. Moreover, this study has employed Mass Miniature Radiography for the detection of the respiratory illness. However, the validity of this tool in detecting respiratory infections needs to be explored.

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