Factors affecting disease condition of hospitalized respiratory disease patients

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ABSTRACT

The present investigations were done to study the factors affecting disease condition of 73 hospitalized pulmonary disease patients at KMC Hospital, Attavar, Mangalore, Karnataka. It was found that there was higher prevalence of chronic obstructive pulmonary disease (COPD) among all other respiratory diseases (36.99%) followed by tuberculosis (19.18%). There was negative and positive correlation between the fruit consumption and unhealthy habits respectively with disease occurrence. Majority had sedentary lifestyle (69%) with very less or no physical activity and more number of subjects (60%) had been taking mixed diet. The subjects who had tuberculosis were younger (35 years old) than all other patients. Lung cancer and bronchiectasis were more prevalent between 50 to 60 years of age whereas COPD chronic bronchitis and asthma attacked the people of age more than 60 years. There was no much difference between male and female subjects with respect to disease prevalence.

Keywords: Respiration; respiratory diseases; fruit consumption; COPD; lifestyle habits

INTRODUCTION

Respiration is the process of inhaling of oxygen and exhaling carbon dioxide. The respiratory system anatomically includes nose, pharynx, larynx, trachea, bronchi and lungs. The primary function of respiratory system is to supply oxygen to blood in order to deliver oxygen to all parts of the body; it mainly involves exchange of molecules of oxygen and carbon dioxide by means of diffusion. Respiratory diseases sometimes are referred as pulmonary diseases and most of the time it is the result of complex interaction between gene and environmental factors.

Alamoudi (2006) did a retrospective review of 810 patients hospitalized with respiratory diseases in King Abdulaziz University Hospital, Jeddah, Saudi Arabia over 5 years. Fifty-five per cent of the patients were males and 56.3 per cent were Saudis. The mostly affected age group was 46-65 years (41.8%). Asthma (38.6%), chronic obstructive pulmonary disease (COPD) (17.2%), pneumonia (11.5%), lung cancer (8.4%) and tuberculosis (TB) (7.2%) had the highest prevalence among hospitalized patients. Asthma was higher among females (63.3%) than males (36.7%). In contrast lung cancer, COPD and TB were higher among males (88.2, 66.9 and 74.1%) than females (11.8, 33.1 and 25.9%) respectively. The mostly affected age groups among asthma and TB were 26-45 years and 46-65 years respectively while the mostly affected age group in lung cancer and COPD patients was 46-65 years. Diabetes mellitus (22.8%) and hypertension (15.1%) were the most prevalent associated diseases. In 75 per cent of the patients the length of stay ranged from 1-7 and 8-14 days. Thus asthma, COPD and pneumonia were the leading causes of hospitalization among patients with respiratory disorders while diabetes and hypertension were the most commonly associated diseases.

In India few population-based studies on the prevalence of COPD have been conducted; these studies have reported figures ranging from 1.4 to 9.4 per cent in males and 1.3 to 4.9 per cent in females (Ait-Khaled et al 2001, Radha et al 1977, Qureshi 1994, Akhtar and Latif 1999). In a review on population studies by Jindal et al (2001) a median figure of 5 per cent for males and 2.7 per cent for females has been estimated. Radha et al (1977) observed a prevalence

of 1.96 in an affluent locality of Delhi whereas Chhabra et al (2001) noted a higher prevalence of respiratory symptoms. A similar lower prevalence was observed among non-smoker males and females in studies reported from Chandigarh from both rural and urban areas and among teachers (Behera and Malik 1987). However a community-based study in the rural area of Kashmir reported a considerably higher prevalence that was attributed to domestic air pollution, lower socio-economic status, poor housing facilities and overcrowding (Radha et al 1977). All these factors were distinctly lacking in present study population that may explain the lower prevalence of respiratory symptoms. In an urban area of Kashmir, a prevalence of 5.7 per cent for chronic bronchitis (Qureshi 1994) was reported while in a south Indian village a prevalence of 3.3 per cent was reported for chronic bronchitis (Ray et al 1995).

Chhabra et al (2008) studied the prevalence of respiratory morbidity and its associated factors in urban Delhi. A total of 3,465 individuals were interviewed of which 1,756 (50.68%) were males and 1,709 (49.3%) were females. Only 9.05 per cent of the men smoked. The overall prevalence of chronic cough, chronic phlegm and dyspnea was 2.0, 1.2 and 3.4 per cent respectively. The prevalence of wheezing was 3.2 per cent. All the symptoms increased with age. No significant difference was observed in these symptoms between males and females. Less educated and retired individuals were more likely to have respiratory symptoms. The prevalence of chronic cough, chronic phlegm, dyspnea and wheezing was 5.8, 2.9, 9.9 and 8.7 per cent respectively among smokers which was significantly higher than that observed in non-smokers. The age and smoking remained significant factors for occurrence of all the respiratory symptoms.

Types of respiratory diseases

Asthma: Asthma is defined as a chronic inflammatory disease of the airways. The chronic inflammation is associated with airway hyper responsiveness (an exaggerated airway-narrowing response to triggers, such as allergens and exercise) that leads to recurrent symptoms such as wheezing, dyspnea (shortness of breath), chest tightness and coughing which is generally associated with widespread but variable airflow obstruction within the lungs that is usually reversible either spontaneously or with appropriate asthma treatment (https://ginasthma.org/).

Chronic obstructive pulmonary disease: Chronic obstructive pulmonary disease (COPD) is a lung disease associated with chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible (https://www.who.int/respiratory/copd/definition/en/). COPD is characterized by persistent airflow limitation that is usually progressive and associated with a chronic inflammatory response in the airways and lungs to noxious particles or gases. The persistent airflow limitation results from a combination of diffuse small airway disease and destruction of the lung parenchyma (emphysema). COPD is a syndrome with many phenotypes. They have been poorly defined and knowledge of their specific aetiology, pathogenesis, management and meaningful outcomes is limited. Chronic bronchitis (defined as cough and phlegm for at least 3 months per year in 2 consecutive years) may precede or coincide with airway narrowing but may also be seen in patients without COPD (https://www.erswhitebook.org/chapters/chronic-obstructive-pulmonary-disease/).

Bronchitis: Bronchitis is an inflammation of the bronchial tubes causing excessive swelling and mucus production. Cough, increased expectoration of sputum and shortness of breath are the main symptoms of bronchitis (Cohen et al 2010). Bronchitis can be either acute or chronic. Acute bronchitis is caused by the same infection that causes the common cold or influenza and lasts about few weeks (Albert 2010, Scaparrotta et al 2013). Chronic bronchitis is defined as a cough that occurs every day with sputum production that lasts for at least 3 months 2 years in a row (Kim and Criner 2013).

Tuberculosis: Tuberculosis (TB) is caused by bacteria (*Mycobacterium tuberculosis*) that most often affect the lungs. Tuberculosis is curable and preventable. TB is a disease which spreads from person to person through the air. When people with lung TB cough, sneeze or spit they propel the TB germs into the air. A person needs to inhale only a few of these germs to become infected (https://www.who.int/news-room/fact-sheets/detail/tuberculosis).

METHODOLOGY

The present study was conducted to investigate the factors responsible for disease condition in hospitalized respiratory disease patients and to know the prevalence of different respiratory diseases among

the subjects. The clinical-based study was performed at KMC Hospital, Attavar, Mangalore, Karnataka from 1 June to 30 July 2018 with 73 (both male and female) hospitalized patients suffering from different respiratory diseases. Demographic details, anthropometric measurements like height and weight were noted to assess the nutritional status of the individuals. Dietary pattern and food frequency questionnaires were used to elicit their dietary intake. Compiled data were analyzed by correlation test using statistical package for social science (SPSS) software.

Table 1. Occupation of subjects

Occupation	Subjects	
	Frequency	Percentage
Service	10	13.70
Business	16	21.90
Homemaker	31	42.50
Farmer	12	16.40
Student	04	5.50
Total	73	100.00

RESULTS and DISCUSSION

The data given in Table 1 represent the occupation of individual subjects having diagnosed with respiratory diseases. It was found that group belonging to homemakers had highest number of subjects suffering from respiratory diseases (42.50%) which could be because most of the homemakers had sedentary lifestyle, lack of knowledge regarding importance of exercise etc and in some cases use of fuelwood for cooking could be the cause for disease.

Fig 1 represents the per cent value of disease condition of selected subjects. It shows higher prevalence of COPD among all the other respiratory diseases (36.99%) followed by tuberculosis (19.18%) and asthma and lung cancer (16.44% each). Asthma is second most dreadful and most common respiratory disease which is highly prevalent in children and elderly worldwide (Alamoudi 2006). The least prevalent disease was chronic bronchitis (4.11%).

Fruits are said to be vital sources of essential micronutrients, vitamins and minerals and good sources of fibers. Fruits like citrus have strong scavenging effect; they help in reducing number of free radicals which are responsible for most of the respiratory diseases. The high consumption of fruits exhibits a protective effect against the respiratory diseases fruits being rich in antioxidants, flavonoids and other essential micronutrients which possess healing factor of damage

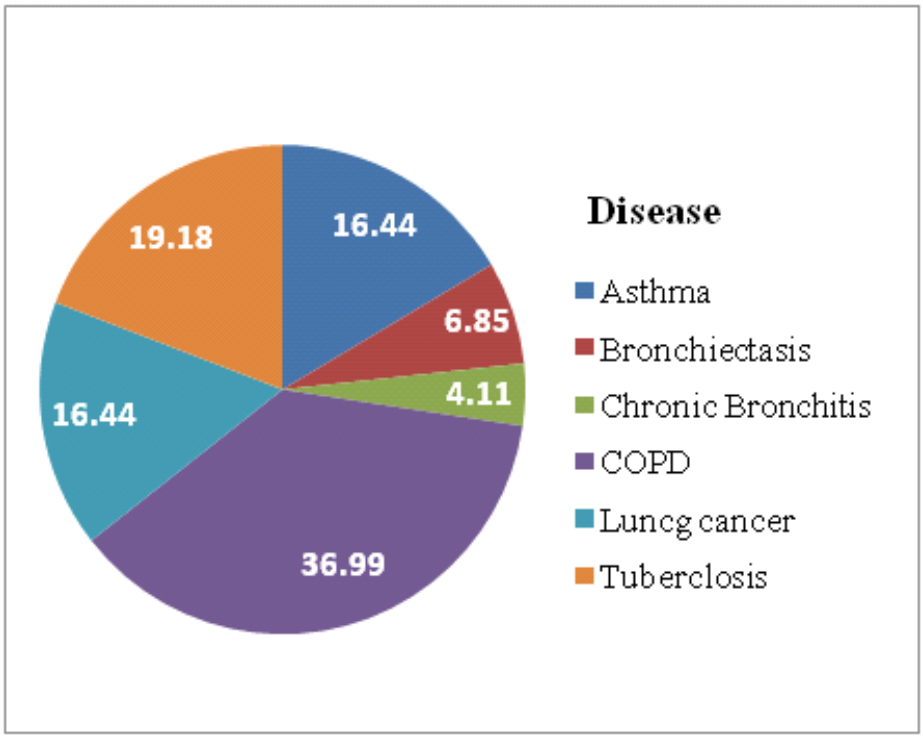

Fig 1. Per cent distribution of subjects as per disease

caused by reactive oxygen species (ROS). The study showed the negative and positive correlation between the fruit consumption and unhealthy habits respectively with disease occurrence. It can be interpreted that low intake of fruits for prolonged period associated with unhealthy habits of subjects increased risk factors for respiratory diseases (Table 2).

Association of physical activity and respiratory health is well known; increased physical activity enhances the cardio-respiratory system which increases the uptake of oxygen and keeps an individual healthy. It was found that majority had sedentary lifestyle (69%) with very less or no physical activity and only 31 per cent possessed moderate activity level

Table 2. Correlation between disease condition, fruit consumption and unhealthy habits

Aspect	Variable	Pearson correlation (r)
Disease condition	Fruit consumption	-.086
	Lifestyle habits	.145

Table 3. Distribution of subjects as per activity level and type of diet

Component	Type	Subjects	
		Frequency	Percentage
Activity level	Sedentary	50	69
	Moderate	23	31
Type of diet	Mixed	44	60
	Vegetarian	29	40
Total		73	100

(Table 3). It was also found that more number of subjects (60%) had been taking mixed diet that also included non-vegetarian products. On the other hand only 40 per cent were vegetarians.

Data given in Table 4 reveal that the subjects who had tuberculosis were younger (35 years old) than all other patients. This shows that younger people were more prone to *Mycobacterium tuberculosis* infection. Lung cancer and bronchiectasis were more prevalent between 50 to 60 years of age whereas COPD chronic bronchitis and asthma attacked the people of age more than 60 years. Aging is one of the factors which brings about several physiological, structural and functional changes such as decrease in the volume of thoracic cavity and deterioration in lung functioning which makes breathing difficult. The decreased immunity also leads to respiratory diseases in elderly. Brescia (2010) reported that prevalence of asthma, bronchitis and COPD was high in elderly and the same observation was made in the present study.

In the present study it was found that there was no much difference in disease condition between

Table 4. Average age of disease condition

Disease	Average age of subjects (years)
COPD	64
Tuberculosis	35
Chronic bronchitis	69
Lung cancer	57
Bronchiectasis	53
Asthma	63

Table 5. Distribtion of diseased subjects as per gender

Gender	Subjects	
	Frequency	Percentage
Male	39	53
Female	34	47
Total	73	100

male and female subjects which was close to 50 per cent. However the male subjects were higher (53%) than the female subjects (47%) (Table 5). According to Pal (2010), in 2008 women suffered predominantly from asthma, hay fever, sinusitis and chronic bronchitis compared with men. Recent studies report high prevalence of COPD among females and nutrition as prognostic marker in COPD (Bhakare et al 2016).

CONCLUSION

It was observed that fruit consumption had a negative correlation with respiratory disease condition and unhealthy lifestyle habits exhibited positive correlation. It is evident from study that an increased

amount of fruit intake reduces the prevalence of respiratory disease. The presence of anti-inflammatory and antioxidant properties in fruits is beneficial to scavenge the ROS and reduce the damage caused by them. The homemakers who had lack of knowledge regarding physical activities were comparatively more in the study conducted. Hence there was need to educate the people to take more fruits and do more physical activities to keep themselves fit

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