Asthmatics Treatment Updation and Compliance in the Asthma Management in Northern Districts of Tamilnadu

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ABSTRACT

The purpose of this study is to evaluate the treatment of asthmatics in Tamilnadu's northern districts and its compliance in socio-economic aspects. A random sampling, and the non comparative study conducted among 500 asthmatic people around the northern districts of Tamilnadu, including Chennai, Kanchipuram, Vellore, and Puducherry. The questionnaire asked the asthmatics about their treatment updation, and compliance in asthma management, in an open-ended and easily understandable manner. The P-value calculated through the social statistics software and p-value of <0.10 was considered statistically significant. A total of 500 patients enrolled in this study. Total Men asthmatic patients enrolled were 272(55.4%), and women patients were 228(45.6). In asthma, there are two types of drugs involved in the treatment.1. Reliever drugs and 2. Controller drugs. Four hundred seventeen patients in treatment, 6% of patients were in reliever treatment, 69% were in the controlled, and 25% in both the drugs treatment, respectively. In addition, patients in ICS+ LABA combination was 390.21% of patients were in Formoterol+ Beclomethasone(FBE) combination, 39% in Formoterol +Budesonide(FBU), 6% in Formoterol+Fluticasone(FF), 4% in Formoterol+Mometasone(FM) and 30% in Salmeterol+Fluticasone(SF). Money spent on their treatment 24% patients spent less than Rs.150 for their asthma treatment for a month, 29% spent Rs.150-300 and more than Rs 300 spent by 47% of the patients. In Asthma Management, Medical practitioners had prescribed ICS +LABA combination for their asthma patients; as a result, patients felt an improved quality of life.

INTRODUCTION

Asthma remains to be one of the most affected diseases worldwide. Due to industrialization and other factors are resulting in the pollution of our planet. In human beings, the mortality rate is increasing due to the evolution of known and unknown microorganisms and diseases (shivashankar and Mani, 2015). Here the affected group is high in developing and underdeveloped nations. If this situation prolongs, half of the globe should be in nebulization. The regime has to create alertness about air pollution and its impact on humanity (Global asthma, 2014).

On the other hand, personal responsibilities help to reduce the severity of the environment. In this article, we studied the basics of asthma and its impact on the people under the categories of symptoms, awareness, type of medication, and administration route. It affects socio-economically. (WHO, 2007).
Asthma is a chronic lung disorder that includes coughing, wheezing, and shortness of breath (Jarvis et al., 2017). As a result, the patient suffers from breathing problems, as asthma affects the bronchial tubes or airways.

The normal respiration process starts when oxygen enters into the nose and reaches the lung and finally back out again as carbon dioxide (Montesantos et al., 2017). In asthmatics, the bronchial tubes are hyperactive to all trigger factors of asthma. It makes the smooth muscle that surrounds the airways tighten up, and more mucus production happens (See et al., 2016). It results in difficulty in breathing.

**Types of Asthma include**

1. Asthma-child onset
2. Asthma- adult-onset
3. Asthma-exercise-induced
4. Asthma-cough induced
5. Asthma-occupational
6. Asthma-steroid resistant
7. Asthma-nocturnal
8. Asthma-cute severe

Asthma-brittle (Harber et al., 2018)

Treatment plays a significant role in asthma. Currently, three routes of treatment are in practice. They are oral, I V, Inhalation. However, experts prefer the inhalation route because of its site, and duration of action and minimal drug usage (Zervas et al., 2018).

**Prevalence of Asthma**

The Global Burden of Asthma: Current estimates 1. 334 People with Asthma is 334 million. 2. Asthma symptoms are experienced, with 14% of the world’s children. 3. Asthma symptoms are experienced by 8.6% of young adults (aged 18-45). 4. 4.5% of young adults are currently taking treatment for asthma. 5. Children and the elderly are most significant in suffering the burden of asthma. 6. In terms of extent and disability duration, asthma is the 14th most important disorder in the world (Ellwood et al., 2017)

Currently, around 300 million people have asthma and projected to be 400 million in 2025 (Becker and Abrams, 2017). Each year, because of asthma 5, 00,000 hospitalizations, and around 2, 50,000 death is occurring worldwide. Meanwhile, allergic rhinitis affects approximately 30% of adults and 40% of children (Sultész et al., 2017). In India, the prevalence of asthma is increasing every day. Unfortunately, due to a lack of appropriate epidemiological data to determine the prevalence of asthma or allergic rhinitis (Koul and Dhar, 2018). The ICMR study, the prevalence of bronchial asthma is 38% in India, Moreover 20-26% suffer from allergic rhinitis, and the symptoms are experienced by 75% of children and 80% of adults with asthma (Tundia and Thakrar, 2018). The number of the present Indian population estimated at one billion-plus, the figure suggests the enormity of the burden of rhinitis and asthma in the country (Jindal et al., 2012).

**Objective**

The purpose of this study is to evaluate the treatment of asthmatics and compliance in Tamilnadu’s northern districts in socio-economic aspects.

**Study population**

This study is multicentric, random sampling, and the research conducted among 500 asthmatic people around the northern districts of Tamilnadu, including Chennai, Kanchipuram, Vellore, and Puducherry. The study area included rural, urban, and mixed locations.

**Sampling and data collection**

According to the gender, socio-economic condition, types of symptoms, treatment, undertaken, awareness, and medication were taken. The cumulative data provides an entire picture of asthma affected people (Julie Ponto, 2015). A survey conducted in asthma camps clinics and hospitals. Primary data was collected by survey method from all the patients in all aspects as per the questionnaire. Secondary data were retrieved from the internet, which consists of information from the journals, newspapers, and other sources that are collected.

**Survey sheet**

We compared questionnaires used by top institutes for surveying the asthmatic patients. Finally, the questionnaire framed by the Minnesota Department of Health for the asthmatic patients found to provide all information about asthmatics in all aspects (Lutzker et al., 2010). We took that as a model and modified the questionnaire, which suits Indian patients. In addition to the guidance of top specialities in respiratory medicine, we added questions in the area of awareness and treatment cost. Time estimated to complete the questionnaire was calculated to be 20 minutes. Most of the questions in the survey were in closed-ended, and multiple option type for the patient’s convenience.

**Evaluation and statistical analysis**

The questionnaire was developed with both open and closed-ended questions. Open-ended questions were used in symptom and trigger factor-related questions, and closed-ended questions were applied to get the efficacy and the treatment compliance aspects. In socio-economic related matters, the question was scaled in three categories as Easy, Medium, and Hard, yes or no answers were accepted for awareness aspects. In economic and after treatment aspects, in terms of Money spent and
the options included same, satisfactory, and good, respectively (Casciano et al., 2017). The statistical analysis was done in all aspects of all topics discussed in the questionnaire. In the treatment aspect, Types of devices used in the treatment and drugs used in controlling the symptoms of asthma. The P-value was calculated through the soc sci statistics software, and a p-value of <0.10 was considered statistically significant.

RESULTS

Study population and characteristics
Five hundred asthmatic patients were enrolled in this study. Men patients enrolled were 272 (55.4%), and women patients were 228 (45.6). The backgrounds of the patients were rural, urban, and mixed type locations. Qualification was categorized into four types they are 1. <10 standard, 2. Pre college 3. College and 4. ITI or Diploma. Several patients categorization is mentioned in Table 1.

Occupation and work exposure
Out of 500 patients, 32.4% of patients were Housewife, 31.2% of patients were unemployed (includes School goers and parent dependents), 12.2%, 8.8%, 7.8%, and 7.6% patients were Daily wages, Business people, Farmers and Retired respectively.
Based on the occupation, the work type of the patient was categorized as easy (60.8%), medium (32.4%), and Hard (6.8%). The work exposure of the patient was polluted and Non Polluted exposure. Two hundred eighty-two patients were working in polluted exposure, and the rest of 218 patients were working in non-polluted areas. Polluted work exposure consists of Industry, Dust, Household, and other types of pollution are discussed in Figure 1.

Figure 1: Types of pollution

Patients exposed to household pollution are mainly categorized as gas users and chullah users for cooking purposes. Gas users were experiencing asthma symptoms during sautéing, frying, etc. Cooking in the chullah, the users were experiencing more asthma symptoms.

Symptoms and trigger factors of asthma
Symptoms of Asthma include wheezing, shortness of breath and chest tightness, etc. In this study, we considered the symptoms like wheezing and chest tightness (345 Patients), Shortness of breath (189 patients) and Shortness of breath during exercise (312 patients). Patients who were experiencing the symptoms for ten years were 322 patients with wheezing and chest tightness, 175 patients in shortness of breath, and 303 patients with shortness of breath during exercise.
Perfumes, pollens from plants, industry smoke, smoking, and climate conditions are considered some of the examples as trigger factors for Asthma (Xu et al., 2016). Out of 500 patients, 27 patients were allergic to animals, 139 patients were allergic to perfumes or strong sprays, 99 patients were allergic to passive smoking.

Awareness of Asthma
Even though pharmaceutical companies, NGOs, and government sectors are continuously advertising about asthma through media communications (Jat and Kabra, 2017). But the awareness about asthma was quite low in some parts of the survey locations. It is mentioned in Figure 2.

Figure 2: Awareness about Asthma

Asthma and treatment
Patients had more options in selecting the doctors for their asthma treatment. In the present study, the patient’s symptoms were controlled by General Physicians, Consultant physicians, Chest physicians, and others. The therapy done by physicians was physical, spirometer, and Peak flow master (Loo and Wark, 2016) and are mentioned in Table 2.

Route of administration

Figure 1

Types of pollution

- Industry: 16%
- Dustmites: 17%
- Household: 52%
- Others: 15%

Figure 2

Awareness about asthma

- Yes: 218
- No: 282

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Table 1: Study population and characteristics

| Category       | No of Patients (%) | P-Value |
|----------------|--------------------|---------|
| Men            | 272(55.4)          | 0.18    |
| Women          | 228(45.6)          |         |
| Place Type     |                    |         |
| Rural          | 152(30.4)          | 0.346   |
| Urban          | 192(38.4)          |         |
| Mixed          | 156(31.2)          |         |
| Education      |                    |         |
| <10 Std        | 293(58.6)          | 0.368   |
| Precollege     | 114(22.8)          |         |
| College        | 65(13)             |         |
| ITI or Diploma | 28(5.6)            |         |

Table 2: Asthma and treatment

| Type of Doctor       | No of patients (%) | P-Value |
|----------------------|--------------------|---------|
| General Physicians   | 214(43%)           | 0.01    |
| Consultant physicians| 94(19%)            |         |
| Chest                | 160(32%)           |         |
| Others               | 32(6%)             |         |
| Examination by Doctor|                   |         |
| Physical             | 53(11%)            | 0.40    |
| Spirometer           | 417(83%)           |         |
| Peak Flow master     | 30(6%)             |         |

Route of administration plays a significant role in asthma treatment (Gregoriano et al., 2018). Out of 500 patients, 81(16%) patients took their medications through the oral route, 2(<1%) patients took through Intravenous route, and 417(83%) patients took through an inhalation route is mentioned in Figure 3.

Figure 3: Route of administration

There are three types of inhalers. They are Dry powder inhalers (DPI), Pressurised Metered Dose Inhaler (pMDI) and Nebuliser. 47% patients were in the DPI route, and 50% of patients were in pMDI, and 3% patients were in nebulizer route of treatment for (Bosnic-Anticevich et al., 2016) and mentioned in Figure 4.

Figure 4: Type of inhalers

In India, most of the pharmaceutical companies have their DPIs in the market (Negro, 2015). But in the present study, the patients used the Revoliser inhalers from Lupin and Cipla and Lupihaler as mentioned in Figure 5.

In inhalation therapy, taking medicines through the devices is directly proportional to drug delivery. But the techniques involved in tak-
ing medications were challenging tasks to the patients (Ramadan and Sarkis, 2017). Out of 417 inhalation patients, 247 (59%) patients found it easy, 134 (32%) patients and 36 (9%) patients found it hard in techniques involved in inhalation devices (Roy et al., 2011).

**Drugs included in asthma treatment**

In asthma, there are two types of drugs involved in the treatment. 1. Reliever drugs and 2. Controller drugs. Reliever drugs are to be used only during symptoms, as and when required. eg. SABA and Inhaled anticholinergic and Controller drugs help in controlling the symptoms and help to improve the patient’s quality of life. eg. LABA and ICS (Mia et al., 2018). Depending on the patient need and severity of asthma, the prescription differs. Four hundred seventeen patients, 6% of patients were in reliever treatment, 69% of patients in the controlled, and 25% in both the drugs treatment, respectively and mentioned in Figure 6.

**DISCUSSION**

In the present study, 500 patients were surveyed in all aspects of asthma and its socio and economic impact on the patients. The survey was conducted in the northern parts of Tamilnadu, classified as three locations as an urban, rural, and the mixed type of towns. Most of the patients completed their primary education and completed higher education. The majority of the patients were Housewife and unemployed. Unemployed includes Patients cur...
Currently pursuing education, and the rest were farmers and business people.

The work types categorized as easy, medium, and hard. Housewife, retired and unemployed patients were in easy work type. Daily wages, business, and farmers were in medium, and the hard type was depending upon their work. Due to rapid urbanization, most of the cities in northern parts are polluted by the leather, tanning, and other industries. Besides, lack of awareness about modern cooking and cost factor homemakers tended to cook in chulah (Guarnieri and Balmes, 2014).

Around 50% of patients have experienced all types of symptoms like wheezing and chest tightness and shortness of breath during exercise. But awareness about asthma and its symptoms was below 50% in the surveyed areas. Even though NGOs, Government hospitals, and pharmaceutical companies create awareness about asthma, acceptance to the people is quite low (Haaheta et al., 2006). Moreover, the patients preferred General practitioners for their symptom relief and continuing reliever medications for the treatment of asthma. In urban areas, patients preferred to get treated by chest physicians and consultant physicians (Chapman et al., 2017).

The pharmaceutical organizations regularly conduct pulmonary function tests in the physician’s chamber to serve the people and maintain their business presence in the respiratory speciality segment (Ayuk et al., 2017). Besides, the inhalation concept and its benefits over the oral drugs were established, and awareness among the therapy makes physicians prescribe the inhalation medications. DPI and pMDI are the two types of inhalers in the market. Physicians prescribe based on patient convenience and expenditure (Jahedi et al., 2017). Among the surveyed patients, Doctors prescribed the Cipla Company’s rotahaler and revoliser.

Physicians prefer to prescribe the ICS + LABA combination for his asthmatics (Ohbayashi et al., 2018). The dose of ICS + LABA combination varies upon the symptoms. Also, the patients did not miss their doses and used in a conventional manner (Yawn, 2011). Asthma is burdensome for patients due to the high price of asthmatic medications. Our drug control board in India should take necessary action to reduce the cost of the asthmatic medicines for the benefit of asthmatics (S and Singh, 2018).

CONCLUSIONS

This study about asthma in northern districts of Tamilnadu was clearly described the asthma management by patients with different socio and economic background. Due to more industries in the northern districts of Tamilnadu, Patients were more prone to asthma triggers, and the asthma exacerbations were frequent. Pharmaceutical companies should make individual decisions about reducing the price of their brands apart from the sales aspect. Besides, the Government should take immediate steps to issue low-cost inhalers/free of cost inhalers in all the hospitals for the benefits of the patients. Medical practitioners had prescribed ICS +LABA combination for their asthma patients. As a result, patients felt fewer exacerbations and improved quality of life.

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Conflict of Interest
None.

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