A study on concurrent drug utilization evaluation of antiasthmatic drugs in the tertiary care hospital

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Abstract
A Total of 140 cases on Drug Utilization Evaluation of Anti asthmatic drugs in the Tertiary care hospital have been presented by Observational study. Asthma has been growing in prevalence and has imposed an increasingly large burden on health services. The study was targeted to evaluate the drug utilization pattern in a tertiary care hospital and on educating the patient about the disease, medications in order to improve the health status and quality of life. The prospective evaluation anti asthmatic drug use in outpatient department of tertiary care hospital reveals that most utilized drug was oral preparations. The efficacy of various dosage regimens has been analyzed. The most commonly used drugs are methyl xanthenes, budenoside inhalers, and combination of budenoside with a P agonist. Patient education and medication counseling are essential components in the management of disease like asthma.

Keywords: Drug utilization evaluation, Medication use evaluation, Bronchial hyperactivity.
reliable comparison of reported prevalence from different parts of the world problematic [5]. Nonetheless, based on the application of standardized methods to measure the prevalence of asthma and wheezing illness in children and adults [6].

Aetiology
The exact cause of asthma is not known. All people with asthma have in common is chronic airway inflammation and excessive airway sensitivity to various triggers. Research has focused on why some people develop asthma while others do not. Some people are born with the tendency to have asthma, while others are not. Scientists are trying to find the genes that cause this tendency. The environment you live in and the way you live partly determine whether you have asthma attacks. An asthma attack is a reaction to a trigger. It is similar in many ways to an allergic reaction. An allergic reaction is a response by the body's immune system to an "invader." When the cells of the immune system sense an invader, they set off a series of reactions that help fight off the invader. It is this series of reactions that causes the production of mucus and bronchospasms. These responses cause the symptoms of an asthma attack [7].

Development Of Asthma
Airway Inflammation
Infectious agents constantly enter the body via the respiratory system. The bronchi have several protective methods against these invaders. These include recruitment of inflammatory cells from the blood stream into the bronchial wall, where they directly attack the invading organisms and secrete inflammatory chemicals that are toxic to the organisms, swelling of the bronchial wall, mucus secretion, and constriction of the airway. The fundamental defect in asthma is that, for reasons that are unclear, these inflammatory actions occur in the bronchi when no serious infection, toxin, or other inhaled threat to the body exists.

A direct response of the immune system to a trigger, a cascade of immunologic events that includes inflammatory cells and mediators, an immune-mediated process that leads to inflammatory changes in the airway, including eosinophil recruitment and airway edema [7].

Asthma Treatment: Medications
Asthma treatment will be based on how frequently experience symptoms. Most physicians follow guidelines from the National Heart, Blood, and Lung Institute. Generally, asthma medications that are part of your asthma treatment either provide quick relief and long-term control [8].

Quick-Relief Medications
Bronchodilators
Short-acting bronchodilators (SABA) like Albuterol provide quick relief asthma treatment by relaxing the smooth muscles in the narrowed airways. SABAs are generally inhaled using a device called a metered dose inhaler. In patients who require SABA use only once or twice per week, this may be the only medication needed. Side effects that may notice after using a SABA include Feeling shaky, rapid heart rate and anxiousness after use [8].

Long Term Control Medications
Controller medications need to be taken daily as part of your asthma treatment, even when child feels good and their PEFR is in the green zone [9].

Inhaled Steroids
Inhaled steroids decrease inflammation, or swelling, and irritation in the airways of lungs. With treatment, decreased sensitivity to triggers may also occur. The most common side effects of this asthma treatment are thrush- preventable by using a spacer, a small tube attached to metered dose inhaler, and rinsing after use, hoarse voice and sore throat- may require changing medications.

Long-Acting Bronchodilators
Long-acting bronchodilators, similar to the quick-relief asthma treatment medications, but last for 12 or more hours, may be combined with inhaled steroids in patients with persistent asthma symptoms not responding to inhaled steroids alone. Patients will still need to use their quick-relief inhaler [9].

Cromolyn
Cromolyn works as an asthma treatment by decreasing the activity of certain allergy cells that cause inflammation in the airways, but is less effective than inhaled steroids as a single asthma treatment. As opposed to the inhaled steroids that are taken once or twice daily, cromolyn needs to be
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taken 3 to 4 times daily via a metered dose inhaler to be effective [10].

**Leukotriene Inhibitors**
Many children and parents would prefer an asthma treatment with leukotriene inhibitors because it is delivered as a pill. Leukotriene inhibitors work by decreasing inflammation, constriction of the airways, and mucus production. While there are very few side effects, as a single therapy for asthma, leukotriene inhibitors are less effective than inhaled steroids.11

**Oral Steroids**
A short course of oral steroids, 5 to 7 days, may be needed when asthma symptoms are poorly controlled. Monitoring asthma and avoiding asthma triggers is an important part of asthma treatment that will allow to be more active and feel better. Understanding the purpose of each asthma medication and the common side effects can facilitate a more informed discussion with health care provider at your next visit [12].
The study entitled “study on concurrent evaluation of antiasthmatic drug use was undertaken in outpatient & inpatient department of a multi specialty tertiary care hospital. The present study is in attempt to promote rational drug prescribing by analyzing the health care activities and drug use evaluation study. Our study objects are to study the treatment patterns of bronchial asthma in the outpatient department of tertiary care hospital, ensure that drug therapy meets current standards, compare efficacy of various treatment pattern in asthmatic patient, study the impact of patient education on asthma, control drug costs and identify areas in which further evaluation is needed.

**MATERIALS AND METHODS**
The study was conducted at Outpatient and inpatient wards, Department Medicine, Rama muthaiah medical college and Hospital, 1450 bedded tertiary care teaching hospital, Annamalai Nagar, Chidambaram. The data has been collected from the outpatient & inpatient’s case sheets from department of medicine RMMCH. The main sources of collecting data are Patient interview, Patient case sheet, Prescription, 

**Inclusion criteria**
Patients with asthma, without co-morbid conditions and Patients with age greater than or 18 years are included in the study.

**Exclusion Criteria**
Patients below 18 years of age, Pregnant women, Cardiovascular patients, Lactating women are excluded in the study.

**RESULTS AND DISCUSSION**
**Demographic Data Analysis**
**Table 1. The Percentage of Male and Female Patients**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>55%</td>
</tr>
<tr>
<td>Female</td>
<td>45%</td>
</tr>
</tbody>
</table>

Table showing the gender distribution of male and female patients and the percentage of patients in which males patients are more in number.

**Table 2. Percentage of patients in occupational status**

<table>
<thead>
<tr>
<th>Occupational status</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>13</td>
</tr>
<tr>
<td>Agriculture</td>
<td>40</td>
</tr>
<tr>
<td>House duties</td>
<td>26</td>
</tr>
<tr>
<td>Others</td>
<td>21</td>
</tr>
</tbody>
</table>

This table shows the percentage of patients in various fields such as students, agriculture, house duties, and other states...

**Type of Allergen causing Asthma**
**Table 3. Usage of type of allergen causing asthma**

<table>
<thead>
<tr>
<th>Type of allergen</th>
<th>Percentage of usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold air</td>
<td>54%</td>
</tr>
<tr>
<td>Dust</td>
<td>23%</td>
</tr>
<tr>
<td>Smoke</td>
<td>20%</td>
</tr>
<tr>
<td>Pollen</td>
<td>3%</td>
</tr>
</tbody>
</table>

The subjects were asked about the allergic conditions. Around 54% of subjects feel to get asthma by cold air and 23% by dust. 20% of subjects were affected by smoke and only 3% were affected by pollen.
Mono therapy Drugs

Table 4. Utilization frequency of Monotherapy Drugs

<table>
<thead>
<tr>
<th>Anti asthmatic</th>
<th>Percentage frequency of Monotherapy</th>
<th>Over all percentage of utilization frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylxanthines</td>
<td>38%</td>
<td>37%</td>
</tr>
<tr>
<td>β2 agonists</td>
<td>26%</td>
<td>20%</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>23%</td>
<td>31%</td>
</tr>
<tr>
<td>Leukotrienes</td>
<td>07%</td>
<td>07%</td>
</tr>
<tr>
<td>Mucolytics</td>
<td>06%</td>
<td>05%</td>
</tr>
</tbody>
</table>

In the monotherapy category, only five classes of drugs were used: methylxanthines, β2-agonists, corticosteroids, leukotrienes, and mucolytics. The overall utilization pattern was also similar with methylxanthines (Aminophyline and theophylline combination), Deriphylline salbutamol, salmeterol, and terbutaline were marginally behind, followed leukotrienes and mucolytics (Bromhexine, Ambroxol) shows the most important formulations used for the treatment of asthma.

Age distribution of patients was analyzed. Majority of the patients belonged to the 40 to 49 category, followed by those in 50 to 59 category.

This figure shows the distribution of patients that is 77 percent of patients suffered by Bronchial Asthma only and remaining 23 percent of patients had other co-morbid conditions.

The percentages of the patients who received either Monotherapy or combination therapy, i.e., two, three, four, or five drug regimens were analyzed and it showed that 19% of all the patients were treated with a single anti-asthmatic drug and 81% of patients were treated with anti-asthmatic drug combinations.

When the patients were asked to inform about their preferences of their treatment, Majority reported that they prefer to take inhaler, and less members preferred to use nebulizer for treating their asthma.
Study about Inhaler Techniques Adapted
Blue peak indicates the pre intervention where as Red peak indicates the post intervention of usage of inhalers in patients with asthma.

DISCUSSION
The work was carried out in the outpatient & inpatient department of medicine in RMMC & H Annamalai University, Chidambaram 1450 the study was care hospital, for 3 months duration Jan - 2012 to March-2012. Every breath that we take is synonymous with life. Asthma has been growing in prevalence and has imposed an increasingly large burden on health services. Mortality related to asthma in old age has fallen steadily during the twenty-first century. Mortality rate for asthma among young people is being noticed to have an increasingly index to prevailing epidemics and rising environmental pollution in day to day life. The study was targeted to evaluate the drug utilization pattern in a tertiary care hospital and on educating the patient about the disease, medications in order to improve the health status and quality of life. 140 patients were enrolled during the study period 55 percent were male and 45 percent were females. Majority of the patients belonged to the 40 to 49 age group, followed by those in 50 to 59 categories. 77 percent of patients suffered from Bronchial Asthma only and remaining 23 percent of patients had other co-morbid conditions like hypertension, diabetes and cardiac disorders associated with asthma. From the trigger factors around 54% of subjects feel to get asthma by cold air and 23% by dust. 20% of subjects were affected by smoke and only 3% were affected by pollen. Most patient, 65 percent reported that they prefer to take inhaler, 18 percent preferred tablets, 10 percent preferred to use injections and 7 percent preferred to use nebulizer for treating their asthma. The percentages of the patients who received either Monotherapy or combination therapy, showed that 19% of all the patients were treated with a single anti-asthmatic drug and 81% of patients were treated with antiasthmatic drug combinations. In the Monotherapy category, only five classes of drugs were used: methylxanthines (38%), β2-agonists (26%), corticosteroids (23%), leukotrienes (07%) and mucolytics (06%). The overall utilization pattern was also similar with methylxanthines (Aminophylline and theophylline combination), Deriphylline Retard 300 mg (37%), being the most frequently prescribed drugs. β2 -agonists, salbutamol, salmeterol, and terbutaline (20%) were marginally behind, followed by corticosteroids (Beclolemethasone, Prednisolone, Budesonide) (31%), leukotrienes (07%) and mucolytics (Bronhhexine, Ambroxol) (05%) shows the most important formulations used for the treatment of asthma. The questions regarding the basic steps in the use of inhalers were asked. Most of the patients reported they never or sometimes follow all the steps. After counseling the patients, there was an improvement in the proper use of inhalers, but some reported that the use of inhalers was a complicated process.

SUMMARY AND CONCLUSION
The prospective evaluation anti asthmatic drug use in outpatient department of tertiary care hospital
reveals that most utilized drug was oral preparations. The efficacy of various dosage regimens has been analyzed. The most commonly used drugs are methyl xanthenes, budenoside inhalers, and combination of budenoside with a P agonist. Patient education and medication counseling are essential components in the management of disease like asthma where the basic knowledge about the disease is low among the population. It has been concluded that further studies may help to improve the prescribing and dispensing practices of pharmacists through successful implementation of interventional programs. Future studies may help to clarify the role of xanthenes in comparison to inhaled steroids in the treatment of asthma.

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CONFLICT OF INTEREST
Not interest.

REFERENCES