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Research Article

**AN ASSESSMENT OF ASTHMATIC PATIENTS THROUGH
VARIOUS DIAGNOSTIC EXAMINATIONS**

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Article Received: January 2023**Accepted:** January 2023**Published:** February 2023**Abstract:**

Asthma is a major non communicable disease (NCD), affecting both children and adults, and is the most common chronic disease among children. Inflammation and narrowing of the small airways in the lungs cause asthma symptoms, which can be any combination of cough, wheeze, shortness of breath and chest tightness. Asthma affected an estimated 262 million people in 2019 (1) and caused 455 000 deaths. Inhaled medication can control asthma symptoms and allow people with asthma to lead a normal, active life. Asthma is a long-term condition affecting children and adults. The air passages in the lungs become narrow due to inflammation and tightening of the muscles around the small airways. This causes asthma symptoms such as cough, wheeze, and shortness of breath and chest tightness. These symptoms are intermittent and are often worse at night or during exercise. Other common triggers can make asthma symptoms worse. Triggers vary from person to person, but can include viral infections (colds), dust, smoke, fumes, changes in the weather, grass and tree pollen, animal fur and feathers, strong soaps and perfume. . Achievement of this goal requires the development of new tools including novel Antiasthmatic drugs and more efficacious drugs as well as an increased understanding of the disease. The aim of this study an assessment of asthmatic patients through various diagnostic examination in District hospital, Etawah (U.P).

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INTRODUCTION

It is conditions in which person airways became inflamed, narrow, and swell and produce extra mucus, which make it difficult to breath know as asthma. Asthma is hyper responsiveness of trachea-bronchial muscle to variety of stimuli. Which results of narrowing airways passage? People who suffer from this chronic condition (long-lasting) are said to be asthmatic. The inside walls of an asthmatic's airways are swollen or inflamed. This swelling make difficulty in the breathing and cause irritation. It most often starts in the childhood. Asthma that begins during childhood is called child-onset asthma. This type of asthma happens because a child becomes sensitized to common allergens in the environment like pollen, dust etc.^[4, 5, 6]

In asthma cause bronchospasm (contraction of the smooth muscle in the airways), edema (swelling) and increased mucous secretion (mucous hypersecretion) which leads to the characteristic's symptom of asthma^[1, 2,]

It is well known that patients with asthma have high levels of the specific I g E antibody binds to the receptors of mast cells and inflammatory cells. Interaction between I g E antibody and antigen results in the activation of a series of inflammatory cellular reaction like release of histamines, prostaglandins and leukotrienes which cause contraction of smooth muscle and bronchoconstriction.

SIGN AND SYMPTOMS OF ASTHMA

Asthma is characterized by recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing. Sputum may be produced from the lung by coughing but is often hard to bring up. During recovery from an asthma attack (exacerbation), it may appear pus-like due to high levels of white blood cells called eosinophils.^[3] Symptoms are usually worse at night and in the early morning or in response to exercise or cold air. Some people with asthma rarely experience symptoms, usually in response to triggers, whereas others may react frequently and readily and experience persistent symptoms.^[6]

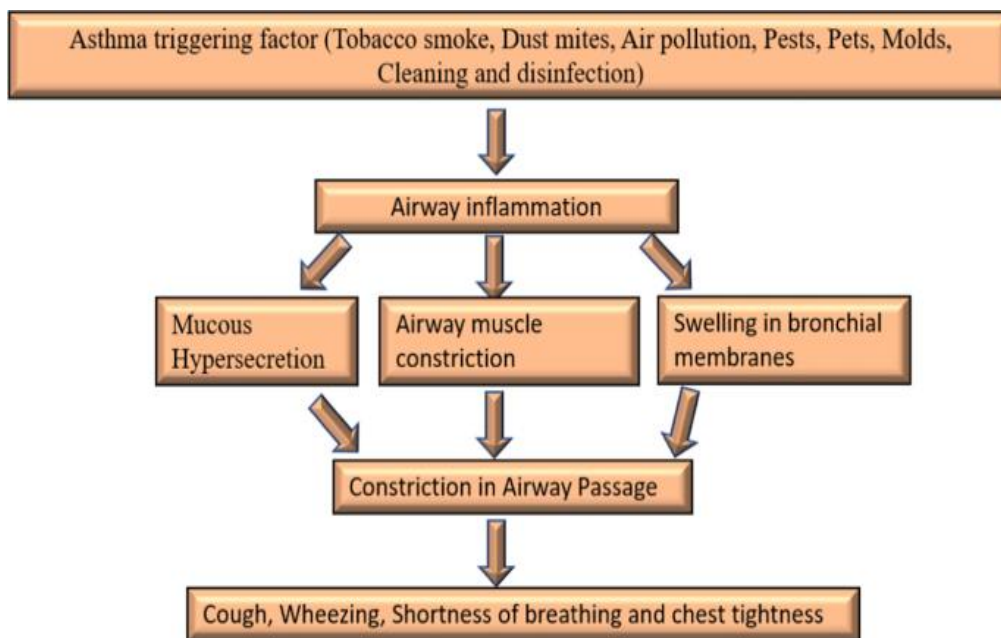
CAUSES

Asthma is more likely if other family members also have asthma – particularly a close relative, such as a

parent or sibling. Asthma is more likely in people who have other allergic conditions, such as eczema and rhinitis (hay fever). Urbanization is associated with increased asthma prevalence, probably due to multiple lifestyle factors. Events in early life affect the developing lungs and can increase the risk of asthma. These include low birth weight, prematurity, exposure to tobacco smoke and other sources of air pollution, as well as viral respiratory infections.^[8,9] Exposure to a range of environmental allergens and irritants are also thought to increase the risk of asthma, including indoor and outdoor air pollution, house dust mites, moulds, and occupational exposure to chemicals, fumes or dust. Children and adults who are overweight or obese are at a greater risk of asthma.

WHO RESPONSE:

- Asthma is included in the WHO Global Action Plan for the Prevention and Control of NCDs and the United Nations 2030 Agenda for Sustainable Development.
- WHO is taking action to extend diagnosis of and treatment for asthma in a number of ways?
- The WHO Package of Essential Non communicable Disease Interventions (PEN) was developed to help improve NCD management in primary health care in low-resource settings. PEN includes protocols for the assessment, diagnosis and management of chronic respiratory diseases (asthma and chronic obstructive pulmonary disease), and modules on healthy lifestyle counselling, including tobacco cessation and self-care.
- Reducing tobacco smoke exposure is important for both primary preventions of asthma and disease management. The Framework Convention on Tobacco Control is enabling progress in this area as are WHO initiatives such as MPOWER and Tobacco Cessation.^[8,9]
- The Global Alliance against Chronic Respiratory Diseases (GARD) contributes to WHO's work to prevent and control chronic respiratory diseases. GARD is a voluntary alliance of national and international organizations and agencies from many countries committed to the vision of a world where all people breathe freely.

PATH PHYSIOLOGY:**Fig: Mechanism of action****CASE STUDY OF ASTHMATIC PATIENTS DURING THE TREATMENT AT DISTRICT HOSPITAL, ETAWAH:**

Written asthma action plan: A description of how the parent or caregiver can recognize when symptom control is deteriorating. The medications to administer. When and how to obtain medical care, including telephone numbers of services available for emergencies (e.g. doctors' offices, emergency departments and hospitals, ambulance services and emergency pharmacies).

The detected asthmatic patients were classified as major, moderate and minor, relying on their severity of clinical significance and crossover checked manually for the presence of enough published medical evidence for the recognized interacting marketers. Primarily based on the

profile of medicines prescribed. On the basis of asthmatic severity, it follows as.

- **Major** –The consequences are probably life threatening or capable of inflicting permanent harm.
- **Moderate**- The outcomes may also cause deterioration in patient's scientific frame and additional treatment or extension of hospital stay.
- **Minor**- The consequences are typically moderate. The effects can be unnoticeable, but need to now not considerably affect the healing outcome. Frequencies expressed as possibilities were used to summarize sex, diagnosis, number of medication disbursed frequency of drug to the patients.^[10]



Fig: Observe the Asthma Patients

COLLECTS THE DATA OF ASTHMATIC PATIENTS FROM THE HOSPITAL:

The data was collected from district hospital and direct patient interview from asthma department. Demographic information (age and sex), length of hospital stay, main diagnosis, number of drugs and details of co morbidities were obtained from the clinical records. All medications that were prescribed, including routine and medications were screened for drug interaction. List of some patients are as given below:

Table: List of Asthmatic Patients during the treatment at District Hospital

| SN. | Patient's name | Age | Sex | Disease cond. | Prescribed drug | Symptoms |
|-----|----------------------|-----|--------|-------------------------|---|---|
| 1. | Mr. Shiv nath | 82 | Male | Severe Asthmatic attack | Salbutamol Rantac Deriphyllin Iacix | Breathing problem. Blurry vision. |
| 2. | Mr. Ramnaresh tiwari | 65 | Male | Severe Asthmatic attack | Salbutamol Deriphyllin Budesonide additional inhalation twice in day. | Difficulties in breathing. |
| 3. | Mrs. Khursed begum | 80 | female | Severe Asthmatic attack | Asthalin inhaler Salbutamol Deriphyllin | Chest tightness. And Shortness of breath. |
| 4. | Mr. Ram naresh | 65 | male | Severe Asthmatic attack | Salbutamol Deriphyllin Budesonide additional inhalation twice in day. | Chest tightness. And Shortness of breath Blurry vision. |

| | | | | | | |
|----|-----------------|----|------|----------------|--|--|
| 5. | Mr. Prabhudayal | 73 | Male | Asthma | Salbutamol Asthalin inhaler Salbutamol Deriphyllin | Chest tightness and coughing. Tiredness. |
| 6 | Mr.Shukhilal | 65 | Male | Chronic asthma | Fluticasone propionate budesonide, and fluticasone furoate | Shortness of breath. Chest tightness or pain. Wheezing, Trouble sleeping caused by shortness of breath, coughing or wheezing. |

DIAGNOSIS:

Physical Examination

Given the variability of asthma symptoms, the physical examination of patients with suspected asthma can often be unremarkable. Physical findings may only be evident if the patient is symptomatic. Therefore, the absence of physical findings does not exclude a diagnosis of asthma. The most common abnormal physical findings are a prolonged expiratory phase and wheezing on auscultation, which confirm the presence of airflow limitation^[11].

Among children with asthma, persistent cough is also a positive finding on physical examination since not all children with asthma wheeze. Physicians should also examine the upper respiratory tract (nose, pharynx) and skin for signs of concurrent atopic conditions such as allergic rhinitis, dermatitis, and nasal polyps (also seen in cystic fibrosis). In paediatric patients, a scoring rubric called the Paediatric Respiratory Assessment Measure (PRAM) has been developed to assess a patient's acute asthma severity using a combination of scalene muscle contraction, suprasternal retractions, wheezing, and air entry and oxygen saturation. This tool has been validated in children 0–17 years of age. And is most commonly used in acute care settings such as emergency departments, paediatric intensive care units and inpatient units.^[12]

Test to Assist the Diagnosis

While no tests specifically and definitively diagnose asthma with certainty, in children 5 years and younger, the following are useful adjuncts.

Therapeutic Trial

A trial of treatment for at least 2–3 months with as-needed short-acting beta2-agonist (SABA) and regular low dose inhaled corticosteroids (ICS) may provide some guidance about the diagnosis of asthma (Evidence D). Response should be evaluated by symptom control (daytime and night-time), and the

frequency of wheezing episodes and exacerbations. Marked clinical improvement during treatment, and deterioration when treatment is stopped, support a diagnosis of asthma. Due to the variable nature of asthma in young children, a therapeutic trial may need to be repeated in order to be certain of the diagnosis.^[13]

Tests for Allergic Sensitization

Sensitization to allergens can be assessed using either skin prick testing or allergen-specific immunoglobulin E. Allergic sensitization is present in the majority of children with asthma once they are over 3 years of age; however, absence of sensitization to common aeroallergens does not rule out a diagnosis of asthma. Allergic sensitization is the best predictor for development of persistent asthma.^[14]

Chest X-Ray

Radiographs are rarely indicated; however, if there is doubt about the diagnosis of asthma in a wheezing or coughing child, a plain chest X-ray may help to exclude structural abnormalities (e.g. congenital lobar emphysema, vascular ring) chronic infections such as tuberculosis, an inhaled foreign body, or other diagnoses. Other imaging investigations may be appropriate, depending on the condition being considered

Lung Function Testing

Due to the inability of most children 5 years and younger to perform reproducible expiratory manoeuvres, lung function testing, bronchial provocation testing, and other physiological tests do not have a major role in the diagnosis of asthma at this age^[15] However, by 5 years of age, many children are capable of performing reproducible spirometry if coached by an experienced technician and with visual incentives^[16]

Exhaled Nitric Oxide

Measurement of fractional concentration of exhaled nitric oxide (FeNO) is not widely available for most children in this age group and currently remains primarily a research tool. FeNO can be measured in young children with tidal breathing, and normal reference values have been published for children aged 1–5 years.⁷⁴⁷ In pre-school children with recurrent coughing and wheezing, an elevated FeNO recorded 4 weeks from any URTI predicted physician-diagnosed asthma at school age,⁷⁴⁸ and increased the odds for wheezing, asthma and ICS use by school age, independent of clinical history and presence of specific IgE^[17]

EMERGENCY TREATMENT AND INITIAL PHARMACOTHERAPY:

Oxygen

Treat hypoxemia urgently with oxygen by face mask to achieve and maintain percutaneous oxygen saturation 94–98% (Evidence A). To avoid hypoxemia during changes in treatment, children who are acutely distressed should be treated immediately with oxygen and SABA (2.5 mg of salbutamol or equivalent diluted in 3 mL of sterile normal saline) delivered by an oxygen-driven nebulizer (if available). This treatment should not be delayed, and may be given before the full assessment is completed. Transient hypoxemia due to ventilation/perfusion mismatch may occur during treatment with SABAs:^[18]

Inhaled Bronchodilator Therapy

The initial dose of inhaled SABA may be given by a pMDI with spacer and mask or mouthpiece or an air-driven nebulizer; or, if oxygen saturation is low, by an oxygen-driven nebulizer (as described above). For most children, pMDI plus spacer is favored as it is more efficient than a nebulizer for bronchodilator delivery (Evidence A), and nebulizers can spread infectious particles. The initial dose of SABA is two puffs of salbutamol (100 mcg per puff) or equivalent, except in acute, severe asthma when six puffs should be given. When a nebulizer is used, a dose of 2.5 mg salbutamol solution is recommended, and infection control procedures should be followed. The frequency of dosing depends on the response observed over 1–2 hours (see below).^[19] For children with moderate-severe exacerbations and a poor response to initial SABA, nebulized ipratropium bromide may be added every 20 minutes for 1 hour only.

Magnesium Sulphate

The role of magnesium sulphate is not established for children 5 years and younger, because there are few studies in this age group. Nebulized isotonic magnesium sulphate may be considered as an adjuvant to standard treatment with nebulized salbutamol and ipratropium in the first hour of treatment for children ≥ 2 years old with acute severe asthma (e.g. oxygen saturation)^[23]

MANAGEMENT:

While there is no cure for asthma, symptoms can typically be improved. The most effective treatment for asthma is identifying triggers, such as cigarette smoke, pets or other allergens, and eliminating exposure to them. If trigger avoidance is insufficient, the use of medication is recommended. Pharmaceutical drugs are selected based on, among other things, the severity of illness and the frequency of symptoms. Specific medications for asthma are broadly classified into fast-acting and long-acting categories.^[21;22] The medications listed below have demonstrated efficacy in improving asthma symptoms, however "real world" use-effectiveness is limited as around half of people with asthma worldwide remain sub-optimally controlled, even when treated. People with asthma may remain sub-optimally controlled either because optimum doses of asthma medications do not work (called "refractory" asthma) or because individuals are either unable (e.g. inability to afford treatment, poor inhaler technique) or unwilling (e.g., wish to avoid side effects of corticosteroids) to take optimum doses of prescribed asthma medications (called "difficult to treat" asthma). In practice, it is not possible to distinguish "refractory" from "difficult to treat" categories for patients who have never taken optimum doses of asthma medications. A related issue is that the asthma efficacy trials upon which the pharmacological treatment guidelines are based have systematically excluded the majority of people with asthma. For example, asthma efficacy treatment trials always exclude otherwise eligible people who smoke, and smoking blunts the efficacy of inhaled corticosteroids, the mainstay of asthma control management^[18]

Bronchodilators are recommended for short-term relief of symptoms. In those with occasional attacks, no other medication is needed. If mild persistent disease is present (more than two attacks a week), low-dose inhaled corticosteroids or alternatively, a leukotriene antagonist or a mast cell stabilizer by mouth is recommended. For those who have daily attacks, a higher dose of inhaled corticosteroids is used. In a moderate or severe exacerbation,

corticosteroids by mouth are added to these treatments.^[26, 27]

People with asthma have higher rates of anxiety, psychological stress, and depression. This is associated with poorer asthma control. Cognitive behavioral therapy may improve quality of life, asthma control, and anxiety levels in people with asthma.

CONCLUSION:

Asthma is the most common respiratory disorder in Canada, and contributes to significant morbidity and mortality. A diagnosis of asthma should be suspected in patients with recurrent cough, wheeze, chest tightness and dyspnoea, and should be confirmed using objective measures of lung function (spirometry preferred). Allergy testing is also recommended to identify possible triggers of asthma symptoms. In most patients, asthma control can be achieved using avoidance measures and appropriate pharmacological interventions. ICSs represent the standard of care for the majority of asthma patients. For those who fail to achieve control with low-to-moderate ICS doses, combination therapy with a LABA and ICS is the preferred treatment choice in most adults. LTRAs can also be used as add-on therapy if asthma is uncontrolled despite the use of low-to-moderate dose ICS therapy, particularly in patients with concurrent allergic rhinitis. LAMAs or biologic therapies targeting IgE or IL-5 may be useful in select cases of difficult to control asthma. Allergen-specific immunotherapy is a potentially disease-modifying therapy, but should only be prescribed by physicians with appropriate training in allergy. All patients with asthma should have regular follow-up visits during which criteria for asthma control, adherence to therapy and proper inhaler technique should be reviewed.

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