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Concept of Zeequnnafas (Bronchial asthma) in Unani & Conventional Medicine: A Review

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Abstract: Asthma is a chronic inflammatory airway disorder that is often characterized by reversible airflow obstruction and chest tightness, wheezing, coughing, and dyspnea, all of which are signs of airway obstruction. They can occur spontaneously, most frequently at night or early in the morning, the following activity or responding to an allergy. This potentially severe chronic disease places a significant financial burden on individuals and their families. The development of bronchodilators and corticosteroids simplified the management of bronchial asthma in modern medicine. In modern medicine, bronchial asthma is treated through broncho-dilators and corticosteroids. Apart from this invention, comprehensive treatment of asthma is still a long way off. The Unani medical system takes a holistic approach to prevent and treating Asthma. This article aims to describe Asthma and find a comprehensive and safe method of managing asthma through a holistic approach to the Unani system of medicine.

Keywords---Asthma, *Ḍīq al-Nafas*, Dama, Herbal drugs, Unani.

I. Introduction, History and background of Asthama.

Unani physicians have used many terms to explain this respiratory ailment with little differences. Some important terms which have been repeatedly used in this context are: Buhr, Rabu, Zeequnnafas, Dama, and Intisabun Nafas. These slightly differ in their connotations but it will be very appropriate to say that these terms actually reflect the severity of the disease at different stages. All the Unani scholars have described and defined it in their own manners based on their clinical and theoretical expertise but for the first time, the great Unani physician of 19th century Hakim Ajmal Khan defined as, "It is an episodic disease characterized by constriction of lung airways." He has used two terms Zeequnafas and Dama to describe this ailment.Zeequnafas is composed of two Arabic words "Zeeq" and "Nafas". Zeeq is derived from the verb which means shorness, severity and hardness and Nafas connotes the meaning of breathing.[1-7]

As a term, it has been defined in many ways. Rabban Tabri defined "Zeequn Nafas" simply as shortness of breath.[7] Ibn Hubal writes that Dama is the disease in which patient takes rapid and deep breath at rest and unable to replenish the required amount of inspired air for the proper perfusion of the heart. [8]

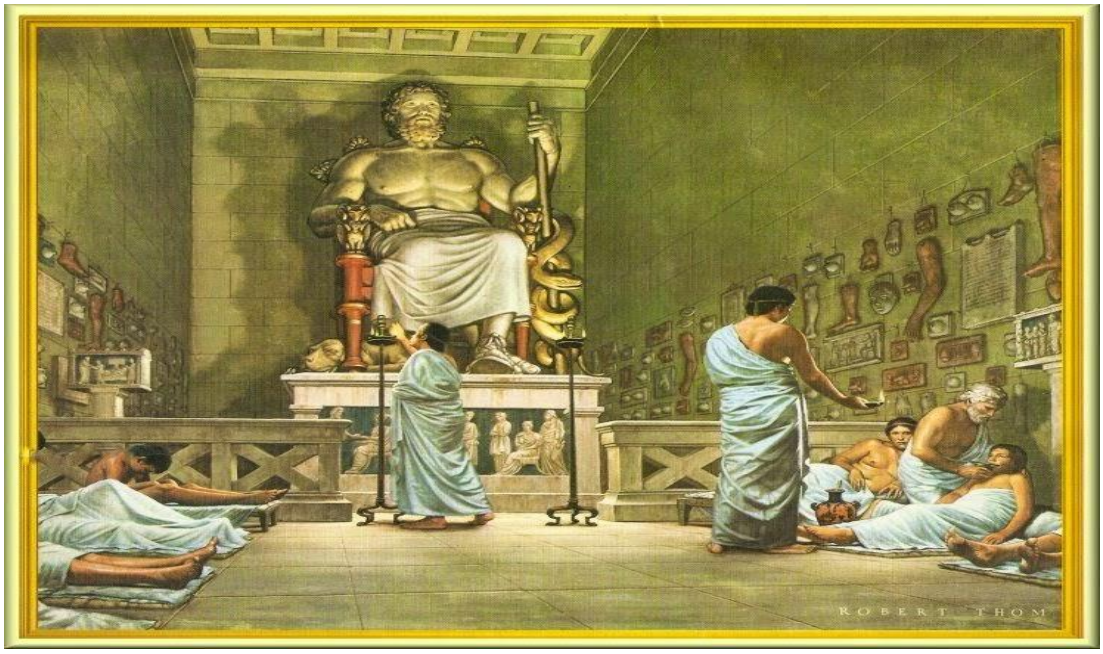

Fig. 01 Asthama- in Ancient Greek & Roman Era

While Ahmad Tabri has defined it more explicitly as Rabu' are those Ghaleez Rutubat which get accumulated in the trachea and lead to shortness of breath, lung is unable to absorb the externally inspired air. Patient is compelled to take abnormally rapid, continuous and short breaths; this phenomenon is called as Dama.[9]

According to Ibn Sina, when the air could not be taken in and out of lung due to narrowness of the airways, is called as Zeequnafas.[10]

Najeebuddin Samarqandi describes that Rabu' (Dama) compels the patient to rapid and shallow breath in the resting condition, with the decreased gap between the two consecutive respirations. The underlying cause is increased need of cold air. Narrowness of the airways and in turn their being stuck with leads to the decreased supply of air to the heart. When the rapid and assisted respiration fails to provide the required amount of air, frequent short spells of respiration are taken to cop up this situation.

Regarding Intasabun- Nafas , he says that in this specific condition, patient breaths in and out by extending his or her neck in the standing position; this adaptation makes the airways widened and air is easily respired.

In the conventional medicine, most definitions have laid emphasis on the variable nature of symptoms, the presence of airflow obstruction, at least in the early stage of the disease.[25,26]As the pathophysiology of asthma became well established, definitions have been changed time to time to include newer pathologies.[11-14]

II. Etiology of Asthma

Unani scholars are described many causes which lead to the affection of asthma.

1) Narrowness of the airways due to any cause.
2) If the disease is by birth, then the chest is narrow. [14-37]

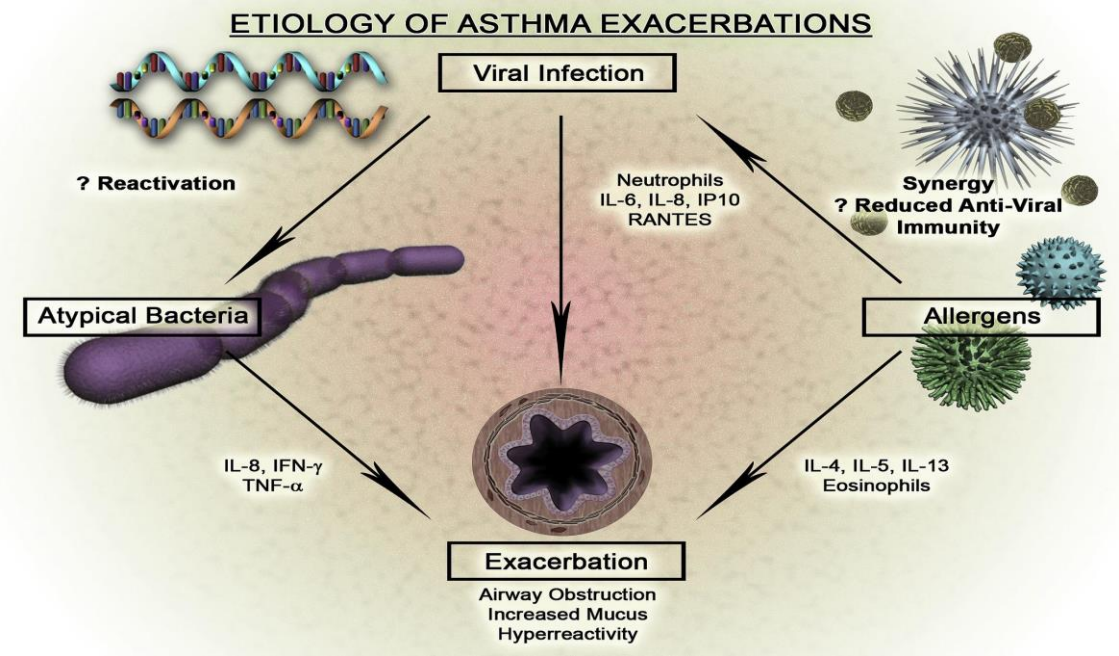

Fig. 02 Sign and Symptoms of Asthama

3) Bukharat from the heart. [14-37]
4) Hararat of lungs. [14-37]
5) Buroodat of the lungs.[14-37]
6) Imtila' in the stomach.[14-37]

But the most elucidating detail of causation with its kinds has given in his books "Firdausul Hikma as:

"Zeequnnafas Mustaqeem is caused due to accumulation of Ratubat or Zo'of, Istirkha or Suqoot of Azla-e-Muataqeema, Zeequnnafas Mutatabey due to Waram-e-Ha'r or excess Hararat in the diaphragm, Zeequnnafas Qawi by Iltehab-e-Harart and Zeequnnafas Zaeef is affected by excess Buroodat. In Zeequnnafas Aseer, Ma'da-e- Galeez obstructs the airways or Riyah-e-Galeez gets entrapped in the chest and surroundings." [7]

He further says that sometimes it occurs due to Zo'ofe dimagh, Wajaul unq or Riyah from the uterus. [7]While Rabu is inflicted by those Fuzlat which get absorbed in the lungs and produce Waram. At times, Nazla from brain secrets in the organ of respiration leading to Zeequnnafas. [7-24]

III. Host Factors Responsible for Asthma.

Host factor provoke asthma in susceptible individuals and these include: genetic factors including gene pre-disposing atopy and airway hyper responsiveness, obesity, and viral infections in early life, gender, ethnicity and exposure to tobacco smoke. However, the mechanisms whereby they induce the development and expression of asthma are complex and interactive. For instance, genes likely interact both with others genes and with environmental factors to determine asthma susceptibility. Besides this, developmental aspects-such as the maturation of immune response and timing of infectious diseases during the first five years of life are emerging as important factors modifying the risk of asthma in the genetically susceptible individuals. Asthma occurs more commonly in relatives of atopic individuals, while non atopic individuals have a very low risk of developing asthma. Asthmatic patients usually suffer from other atopic diseases especially allergic rhinitis found in more than 80% of asthmatic patients and atopic dermatitis. A specific gene for atopy has been recognized on chromosome 11q and chromosome 5q has been linked to the synthesis of IgE antibody. The allergens that lead to sensitization are generally proteins that have protease activity, and most common one are from house dust, cat and dog fur, cockroaches, grass and tree pollens, and rodents. Similarly, tobacco smoke, maternal smoking during pregnancy or infancy, rhino-syncytial virus infections and exposure to high concentrations of allergens during infancy can also induce bronchial asthma. Male sex is a risk factor for asthma in children. The reason for this sex-related difference is not clear. However, lung size is smaller in males than in females at birth but larger in adulthood. Similarly asthma is frequently seen in the obese persons having body mass index more than 30 kg/m^2 and more difficult to control. Obese persons with asthma have lower lung functions and more co- morbidity with normal weight asthmatic patients.[44] The use of systemic glucocorticosteroids with sedentary life style may induce obesity in severe asthma people, but mostly it precedes the development of asthma.[27] How obesity promotes asthma is still undecided but it has been observed that many factors interplay. So it has been proposed that obesity could influence lung mechanics, develop pro- inflammatory state, in addition to genetic, developmental, hormonal or neurogenic influences. They have reduced expiratory reserve volume that may possibly alter airway smooth muscle elasticity and airway functions.[46] Furthermore,interleukin- 6,TNF-α, eotaxin, and leptin, combined with a lower level of anti-inflammatory adipokines can favour influencing the airway function. [27-28-32-42]

IV. Pathogenesis of Asthma

The smaller bronchial airways get packed with blood and air and in turn the air tubes secret a specific kind of fluid named “Balgham”. When this entity occurs solely, is called “Rabu Marzi” and if in association with other organs, and then is said to “Rabu Shirki”. While few physicians have voiced the different pathology of Zeequnnafas and have described as following: [13-22 31]

- Due to Tashannuj leading to the shrinkage of muscle fibres of bronchioles.
- Due to Waram-e-Damvi along with Balgham in the membranes of bronchioles.
- This basic pathogenesis was at first put forth by Samarqandi.
- Due to Iltehaab Haar of thin bronchioles which also causes the secretion of
- Balgham.

Apart from the above mentioned mechanisms, it is also affected by spasm of diaphragm, respiratory muscles, and defects in the respiratory centre of brain. In Firdausul Hikma, Rabban Tabri has described that it is inflicted by those Fuzla't which get absorbed in the lungs.[7] Hakim Ajmal Khan has also favoured the theory of spam in the respiratory muscles leading to the obstruction in the airways. Ibn Sina has written that Zeequnnafas is caused by obstruction due to Auram, Akhla't- e-Galeeza in the airways, Tashannuj in the air passages by Buroodat and Yabusat or congenital narrowing of thorax. In conventional medicine, many theories have been postulated in this regard. [13-22 31]

V. Clinical Features of Asthma

Unani scholars have very efficiently depicted the clinical characteristics of Zeequnnafas. Few scholars like Ibn Hubal Baghdadi has mentioned it on the basis of aetiology, while others have given its clinical description based on the temperament. Etiologically, its manifestations are quite variable. If the underlying cause is Nazla, then it appears after Nazla; and if caused by excess Rutubat, patient expels Balgam during cough. Hakim Ajmal Khan has added that attack of Zeequnnafas will be preceded by constipation and flatulence. Initially there is soft intermittent coughing along shortness of breath; then suddenly patient has severe spat of asthma, feels obstruction in the air passages. Face turns red due to repeated bouts of cough and unable to speak a bit of words. Then a small piece of sputum is coughed out followed by excess sweating, and the attack goes off. In between the gap of attacks, patient appears normal and healthy without any obvious difficulty. [15]

On the other hand, if Rutubat is present in the bronchioles, pulse of the patient will be Khafqa'ni which indicates the existence of pus in the thorax and suggestive of previous wound.[15] Sometime Zeequnnafas is implicated due to Bukharat and Riyaah, chest is tightened without expectoration. In case of Yaboosat, patient feels excessive thirst which only goes off on taking Murattibat without expectoration. [22]

Rabban Tabri has mentioned that it is characterized by shortness of breath, coldness of thorax, facial puffiness, and lack of activeness. But the comprehensive concise description of clinical features has been put forth by eminent physician Najeebuddin Samarqandi. He has depicted the clinical pictures on the basis of causative agents. He writes that if the cause is thick sticky Balgham, there will be sound of wheezing in the lungs due to rubbing of air with the Akhalat-e-Ghaleeza while entering in and out of the lungs along with shortness of breath.[24] If it is due to Bukharat from heart, lungs will be engulfed with air tightly leading to the obstruction of the airways.[24] In addition to the above features, paralysis of respiratory muscles may predispose to reduced expansion of the lungs. Likewise, lungs at times may get shrunk and contracted as happens in the last stage of tuberculosis. In both conditions, respiration is regularly interrupted that results in twice the inspiration and expiration. In the latter one, there is excess Yaboosat with increased tendency of cold eatables. Voice is dumped.[15-22]

Hakim Azam Khan has mentioned the clinical features on the basis of the Mizaj of patients.

- Mizaj-e-Haar manifests as loud voice with long respiration, broad chest, increased tendency of cold air and foodstuffs. Increased thirst is only quenched by cold water. Patient has excess cough in the summer season.

- Mizaj-e-Ba'rid is characterized by shortness of breath, narrow chest, dampened voice, and disinclination towards cold air and foodstuffs.
- In Mizaj-e-Ratab, there is increased expectoration, facial puffiness, wheezing with soft voice.
- Mizaj-e-Yabis is reflected as harsh voice with irritative dry cough.

In conventional medicine, few other manifestations have has been described besides above mentioned features in Unani literature. This can be mentioned under two sub headings.

VI. Sign & Symptoms of Asthma

When patient becomes victim of asthmatic attack, he seeks medical assistance for wheezing, episodic dyspnoea, anxiety, chest tightness and coughing[28,32,50,54] these symptoms show a characteristic diurnal variations of worsening during night and patient may awake early morning. Prodromal symptoms may precede an attack, with itching under the chin, discomfort between scapulae, or inexplicable fear. There is increased thick mucoid production and difficult to expectorate. The degree of breathlessness is not closely to the degree of airflow obstruction but is often influenced by the severity of the attack. Dyspnoea may occur only with exercise, after aspirin ingestion, and exposure to allergens[28-22-35]

On the physical examination, they vary with the stage and severity of the asthma and may reveal only increased inspiratory and expiratory phases of respiration, rhonchi throughout the chest, and there may be hyperinflation. Physical examination during status asthmaticus may reveal:

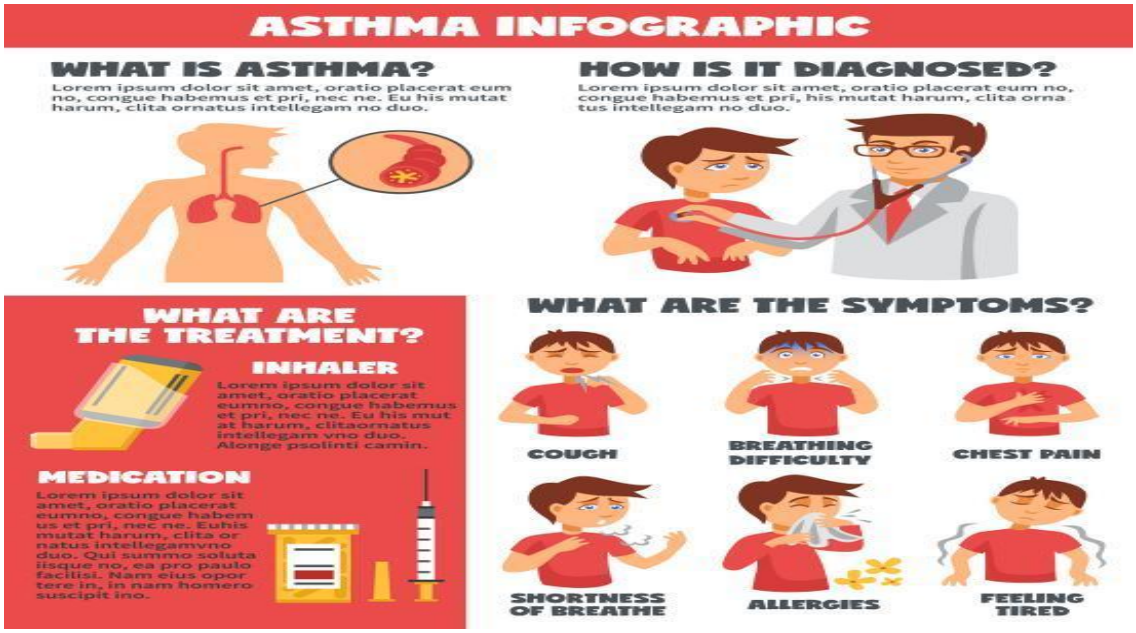

Fig. 03 Asthama- Infographic and causes

- Tachycardia and tachypnoea [27]
- Use of accessory respiratory muscles [27]
- Pulsu sparadoxus [27]

- Wheezing: absence of wheezing (silent chest) or decreased wheezing can indicate worsening obstruction. [27]
- Mental status changes: generally secondary to hypoxia and hypercapnia and constitute an indication for urgent intubation [27]
- Paradoxic abdominal and diaphragmatic movement on inspiration Following signs are suggestive of severe asthma

1) Pulsus paradoxus > 18 mmHg
2) Respiratory rate > 30 breaths/min
3) Tachycardia with heart rate > 120 beats/min

VII. Diagnosis of Asthma

It can be diagnosed on the basis of comprehensive history taking and physical examination. The attack of Zeequnnafas generally occurs in the last part of the night, the chest feels tightened; anxiety is apparent. Patient is unable to expand the chest;inspiratory phase is shorter while the expiratory phase is longer accompanied with wheeze production. Body temperature falls down to 80 or 82 Fº, eyes bulged out, and face is totally masked and anxious with excess sweating. [40]

Hakim Azam Khan mentions that at first the duration of the disease should be enquired. If it is congenital, then it may be due to narrowing of the chest. And if not congenital, then see the presence of any disease related to Waram-e-Riya, Dimaghi wa A'sabi interference, as well as stomach and liver. If present, then Su-e-Tanaffus will be due to these above mentioned causes.

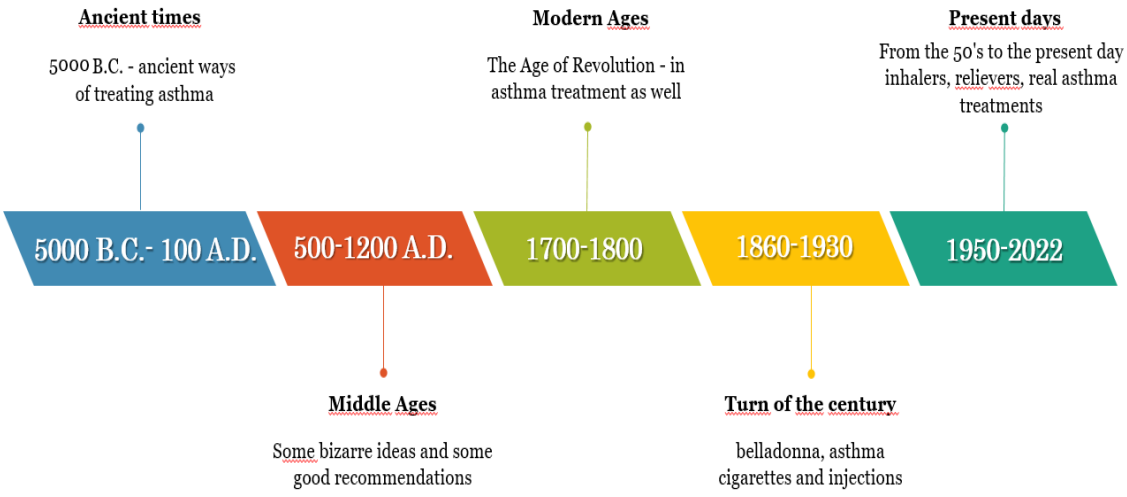

Fig. 04 History of Asthama n Ancient & till modern Era

If Zeequnnafas is the single entity and not associated with any disorder, then interrogate about the nature of cough whether dry or productive. In there is history of expectoration, enquire about the severity of the disease either abrupt or gradual. If severity of the disease suddenly occurs with the symptoms of Nazlae throat discomfort, headache, heaviness and lethargy, then Su-e- Tanaffus is implicated by Madda from the head. And if the onset is gradual with wheezing and heaviness in the chest, thick sputum is expectorated in the cough, then the underlying cause is Rutubat of lungs. [17]

While in conventional medicine, there is no different way to diagnose asthma clinically. So the diagnosis is here also predominantly based on symptoms of variable and intermittent airway obstruction and characteristic history of the disease. A clinical diagnosis of asthma is often prompted by symptoms such as episodic breathlessness, wheezing, cough, and chest tightness. [27]

The most usual abnormal physical finding is wheezing on auscultation, a finding that confirms the presence of airflow limitation. But it is usually confirmed by the objective measurements of lung functions. This can be achieved by using Spirometry. The measurement of FEV_1 and VC can predict the obstructive nature of the ventilatory defects, define its severity, and provide the basis for treatment. Besides this; peak flow meter may be used to detect the reduced lung functions. Likewise, measurement of allergic status can be helpful in identifying risk factors that lead to asthma symptoms in individuals. For patients having consistent asthmatic symptoms, but with normal function, measurement of airway hyper-responsiveness may help to establish the diagnosis.

VIII. Investigations of Asthma

A. Blood Examination: generally patients have an increased tendency of oesinophils in range of 5% to 15%, or absolute oesinophil count is more than 400.There is increased serum IgE and specific IgE in the asthmatic patients. Epidemiologic studies suggest that asthma is unusual in subjects with decreased IgE levels. But blood tests are not usually helpful[27]

B. Sputum Examination: its examination may prove useful in predicting the severity of airway inflammation. It may be either clear or opaque with a green or yellow tinge, but presence of colour does not always indicate infection. To be clearer, examination of a Gram stained or Wright stained sputum smear is suggested. The sputum often contains oesinophils, charcot-leyden crystals, curschmann's spirals, or creola bodies, which can modify colour without presence of infection. In induced sputum after administration of hypertonic saline water with a nebuliser, number of oesinophils is increased. [27]

C. Air Responsiveness: increased AHR is a characteristic feature of bronchial asthma.[32] It is normally measured by methacholine or histamine challenge test with calculation of provocative concentration that reduces FEV_1 by 20%. It is rarely useful in clinical practise, but can be used in differential diagnosis of chronic cough. [28-32]

D. Imaging: chest radiograph is usually normal, but may reveal hyperinflation in severe asthmatic patients. In exacerbations, it may also show complications of asthma such as rib fracture, pneumothorax, and pneumomediastinum.[28,32] Generally High resolution CT is not advised unless there is any other associated respiratory disease, and may show areas of bronchiectesis in severe asthma, and there may be thickening of bronchial walls.

E. Skin Tests: sensitivity to a specific inhalant allergen can be recognised by injecting asmall amount of allergens into the skin. There will be wheal and flare appearance at the site of sensitized skin. They are positive in allergic asthma but negative in intrinsic asthma. That's why they are not much useful in the diagnosis. Exhaled Nitric Oxide: currently it is being used as non invasive test to measure the oesinophilic airway inflammation. The fraction of NO in exhaled air is elevated in asthma. [27]

F. Lung Function Tests: simple Spirometry confirms the airflow limitation with reduced FEV_1, FEV_1/FVC ratio less than 0.7 and PEF.[28,32] Measurement of PEF twice daily may confirm the diurnal variations in airflow obstruction. Flow volume loops show reduced peak flow and reduced maximum expiratory flow.[28] Lung volumes such as RV and TLC are increased in asthma. Carbon Monoxide diffusing capacity is either normal or increased in asthma and reduced in COPD.[32] For assessing severity of asthma, pulse oximetry is a useful tool which detects hypoxemia in severe asthma. In ABG, PaO_2 decreases and $PaCO_2$ remains normal severe asthma. [28-32]

IX. Management of Asthma.

The management of Zeequnnafas is based on causative Akhla't, etiologic factors, and its severity. As in this disease, phlegm gets accumulated in the airways, and provokes cough, dyspnoea; Nujaz and Tanqiya is the basic line of treatment. By this therapeutic process, phlegm is evacuated. For this purpose, firstly the viscosity of the phlegm is modified by the administration of Munzij drugs to its normalcy, and this process is known as Nuzj. Then Mushil drugs are given to the patients to let the modified phlegm out of the body. At times, emetics may also be used to facilitate the purgation. In addition to the above mentioned drugs, Mulattifat and Munaffisat are also used for the easy evacuation of the phlegm. Ibn Sina writes that in the case of severe asthma, then evacuation of the morbid phlegm is very necessary by Mushilaat. Besides this, other causes should also be pursued and properly be treated. For this, Munzij and Mulattif should be prescribed with the utmost precaution, as these drugs may lead to excess viscosity of the phlegm and will pose grave difficulty in the elimination.[56] Razi says that Mulattifat are more useful in the management of asthma; that's why drugs having this property should be judiciously used in this disease such as vinegar, onion, and Sikanjabeen Unsuli. Drugs possessing cold temperament and astringents should be strictly avoided which render the phlegm more viscid.[17-18]

Hakim Azam Khan has advised emetics and purgatives to be used alternatively. He says that drugs like Aabresham, Zoofa, Mulethi, andGao-zaban are very useful in asthma. Ismail Jurjani has favoured the line of treatment based on the underlying cause. Hot and cold tempered drugs should be avoided as it will absorb the watery portion of phlegm very rapidly and leave behind a sticky viscid material. Akber Arzani is the first physician in Unani Medicine who advised that the drugs should also be administered in smoke form, laying the earliest concept of route of inhalation. He recommended Sharbat-e-Zoofaand Sikanjabeen Unsulifor its better management. Hakim Ajmal Khan has laid significant stress on the use of Munzij wa Mushil-e-Balgham drugs. Judiciously, the treatment should be according to the implicated causes. Emetics may also be used to eliminate the phlegm from the lungs. [17-18]

Those substances which lead to phlegm production should be avoided such as Sameen, fresh fish, Ghee etc.[59] Light and soft nutrient diet of hot dry temperament should be advised to the patients. Water should not be taken just after the meals but maintain some gap in between the meal and water.[16] In diet, curry of birds, fox, deer, hair, teetar and Chakor should be given with the bread especially doughed in Badyann. Vegetables like beetroot, Kaddu, turoyi and dry fruits such as Chilgoza, Badam, Akhrot and Findaq should be given in diet.[59] Honey water should be used to quench the thirst.[8]

If the cause is related to Bukharat from heart, then do bloodletting of basilic vein, along with Maush-Shaeer with Luaab-e-Ispaghool, Sharbat-e-Nilofar, and Sharbat-e- Banafsha. [22]

In case of Yaboosat-e-Riya, use drugs which remove dryness like Aash-e-Jao, fresh milk, goat milk, lauqaat, and usaarat. Following are some formulations which have been used by physicians in its management.

- **Rabu Blghami:** use Habb-e-Mushil with the following ingredients: Prepare tablet of Shahm-e-Hanzal 2.25 gram, and Aneesoon 0.75 gram, and use with Maul-Asl. [8]
- **Rabu Rutubi**: make tablets of: Filfil Siyah 400 gram, Nankhuwa 105 gram, Fudanj 105 gram, Beekh-e-Karafs 35 gram, Hashaa 35 gram in the pure honey. Dose is 4.5 gram with Maul-Asl. [8]
- **RabuRihee:** take Jund bedastar and Ushq in equal weight and administer 1.75 gram with Maul-Asl. With reference to Areebasiyus, Razi has written a very best treatment for Rabu comprising of Zarawand Mudahraj and Pudina. Joshanda for Rabu: Zoofa Khushk, Farasiyun, Aslussoos, Eersa, Kamazaryus, Ja'da, Hasha, Fudanj with Roghan BadamTalkh or Roghan Habb-e-Sanobar to be taken as decoction daily. Based on his clinical expertise, Razi has composed Majoon Qinna comprising of Zoofa, Qardmana, Irsa, Tukhm-e-Anjara, Ghareqoon and Aftemoon in equal doses, prepare it in honey, and give 18 gram weekly till the pain gets subsided. The daily dose is 3 grams with Maul Asl.[8]

According to Akbar Arzani and other eminent Unani physicians, it is difficult to treat asthma in adults. In elderly, it is very stubborn to be treated but better to say that it is untreatable. Asthma is a chronic relapsing disease. Most patients have recurrent attacks without major change in the lung functions for many years. [8]

X. Conclusion

Bronchial asthma is an inflammatory airway disease with episodic occurrence of dyspnoea and wheezing. The prevalence of asthma has steadily in the latter part of last century, first in the developed and then in the developing countries. It one of the most common chronic disease globally and currently affects approximately 300 million people worldwide, and an additional 100 million people will be suffered by 2025.

Etiologically many inflammatory cells are implicated, particularly mast cells, oesinophils, T-lymphocytes, Dendritic cells, macrophages, and neutrophils resulting in airway narrowing and airway hyper-responsiveness; on the other hand, Ghaleez Balgham, and Bukharat are the potential markers for its pathogenesis. As far the treatment is concerned, conventional medicine is not equipped with such options which can modify or suppress it to the substantial levels. Available treatments are bronchodilators, anti-cholinergics, corticosteroids etc. Ironically these drugs rapidly relieve the symptoms but lay any effect on the disease process, more over they result in systemic side effects including obesity, osteoporosis, gastric ulceration etc. Keeping these points in view, I have chosen Unani formulation to treat asthma as this is

enriched with varied treatments that have been used for centuries for the management of asthma. To fulfil this objective, I adopted a clinical trial with open label observational design and conducted it at NIUM hospital and tried to evaluate the efficacies of test drugs in asthma. Asthma was diagnosed clinically, radiologically, and on laboratory investigations. Patients fulfilling the inclusion and exclusion criteria were enrolled in the study. Investigations were done before and after the treatment. All subjective and objective parameters were assessed at 0, 15th, 30th, and 45th day of the treatment. On completion of study, all the data inferred from safety, subjective and objective parameters were statistically tested. In subjective parameters, paroxysmal dyspnoea and wheeze were analysed before and after the treatment using the paired proportion test, and the result was found to be effective. Objective parameters were comprised of PFT (FEV_1, FEV_1/FVC) and PEF, eosinophilia, and ESR. All the parameters were recorded before and after the treatment, and the data was analysed using paired student t test and showed significant results respectively. This verifies that test drugs have potential efficacy in asthma management. Drop-outs were only 5 and the reason was non compliance with the protocol. Patients were advised to report in case of relapse after completion of the study. To assess the toxic effects of the test drugs, safety parameters were adhered before and after the treatment, which were overall normal after the completion of treatment. On the grounds of above cited results and discussions, it infers that test drugs "Joshanda Zeequnnafas and Habbe Hindi Zeeqi" are quite effective and safer for the management of asthma. However, other aspects of test drugs need to be explored to provide complete and safe remedy for bronchial asthma.

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