

Scientific validation of Unani compound formulation for its efficacy in bronchial asthma

KC Singhal^{1*}, Furkhunda Jabin¹, Shoaib Ahmad¹, S Z Rahman¹, R K Bhargava² & A Latif³

¹Department of Pharmacology, Jawaharlal Nehru Medical College, AMU, Aligarh 202 002, Uttar Pradesh

²Department of TB & Chest Diseases, JLN Medical College, AMU, Aligarh 202 002, Uttar Pradesh

³Department of Ilmul Advia, Ajmal Khan Tibbiya College, AMU, Aligarh 202 002 Uttar Pradesh

E-mail: rahmansz@yahoo.com

Received 16 March 2007 revised 15 April 2008

The exact pathogenesis of asthma, a chronic inflammatory disease of the respiratory system is still unknown. In recent past, newer drug therapies are being introduced. Drugs of Unani System of Medicine are also being prescribed since ages for the treatment of bronchial asthma. The study was carried out to scientifically validate the Unani compound formulation for its efficacy in patients of asthma. In the study, potency of an herbal drug formulation, reported as mucolytic, antiinflammatory, expectorant and bronchodilator was evaluated. Lung function test was performed before and after the treatment to evaluate the patients. Two parameters, Peak Expiratory Flow Rate (PEFR) and Forced Expiratory Volume in one second (FEV₁) after the treatment showed marked improvement with lesser side effects of test drugs. Hundreds of such herbal drugs are used in various alternative systems of medicine for the treatment of bronchial asthma. These alternative systems of medicine should be explored, so that hidden potential of these systems could be fully utilized to serve the humankind and provide a complete and safe remedy for asthma.

Keywords: Unani Medicine, Bronchial asthma

IPC Int. Cl.⁸: A61K36/00, A61P9/00, A61P11/00, A61P11/06

Asthma is a common, chronic inflammatory disease of the respiratory system with pronounced health and economic consequences. It has been identified as one of the 5 most pressing global lung problems¹. The prevalence of asthma is rising and 5-9% of general population in India is suffering from bronchial asthma². In India, recent report shows wide variation (4-19%) in the prevalence of asthma in school going children from different geographic areas of India³. There has been an increase in mortality as well, particularly in younger age groups⁴. The present knowledge about the pathogenesis of the disease undergoing many modifications has led to improved understanding of asthma and revolutionized its management. Drugs of Unani System of Medicine are also used for the treatment of bronchial asthma⁵. In order to improve asthma care and to find an herbal remedy for bronchial asthma, scientific evaluation of existing Unani herbal compound formulation was carried out.

Methodology

The study was carried out in the Department of Pharmacology, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh with the collaboration of Department of Tuberculosis and Chest Diseases during 2003-2006. A total number of 576 patients were enrolled for the study from OPD of TB and Chest Diseases. Pulmonary Function Test (PFT) was performed with the help of DT-Spiro Respirometer (Maestros Company, India) before and after drug therapy. Forced expiratory volume in one second (FEV₁) and Peak expiratory flow rate (PEFR) were taken as important parameters of PFT to assess the severity of asthma. As per protocol, in the inclusion criteria, patients who had undergone PFT and showed airway obstruction with more than 15% increase in FEV₁ following administration of β agonist in the age groups of 15-70 yrs of either sex were enrolled⁶. Patients having diabetes mellitus, myocardial infarction, acute asthma and patients of bronchial asthma on oral steroid therapy, pregnancy, severe hepatic or renal failure and aged more than 70 yrs were not included in the study. Five drugs of

*Corresponding author

Unani System of Medicine with known bronchodilator, antiinflammatory, antihistaminic, leukotrien inhibitor and expectorant activities were selected (Table 1).

These drugs, *Piper longum* (65 mg), *Adhatoda vasica* (95 mg), *Picrorhiza kuroa* (5 mg), *Hyssopus officinalis* (90 mg) and *Linum usitatissimum* (145 mg) in a dose of 500 mg were combined. The above combination of drugs manufactured by Dawakhana Tibbiya College, Aligarh Muslim University, Aligarh, was ensured of good quality. All tablets were examined and tested for its shape, size and uniformity in weight (500 mg). Tablet dissolution test, tablet disintegration test, tablet friability, tablet hardness and shelf life tests were performed for their stability. When the above tests were found within acceptable limits, these tablets were then used for clinical trial. All tablets in a dose of 500 mg to 1gm were given orally thrice a day after meals. Spirometry for PFT of every patient was done at 0, 7, 15, 30 and 90th day. The change in FEV₁ and PEFr on 7, 15, 30 and 90 day in comparison to 0 day was considered as improvement in illness. For statistical analysis, student's test was applied by using the SPSS software.

Results and discussion

The mean age of patients recruited for the study was 28.23 ± 13 (male, 29.68 ± 15 and female, 26.02 ± 11) and mean weight in kg was 46.8 ± 12. Out of 578 patients, 348 (60%) were male and 228 (40%) were female (Fig. 1). 206 (38%) had positive history of allergy and 178 (31%) had positive family history of asthma (Fig. 2). The patients were categorized in 4 age groups; maximum number of patients, i.e. 308 (53%) were from 15 to 29 age group and minimum number of patients, 24 (4%) were above 60 yrs of age. Majority of patients, who opted

for clinical trial were in the age group of 21-29 yrs (Fig. 3). Out of 576 patients enrolled, only 276 (48%) completed the study and were regular till 90 days of observational period. Thus, a total number of 300 (52%) patients were lost to follow up. The maximum number of drop out cases was on 90th day, which may be either due to long duration of the treatment between 30th day to 90th day or good effect of test drug.

During study, the number of patients exhibiting increment in PEFr and FEV₁ were also considered as improvement in illness. It was found that 313 (65%) patients out of 484 patients on 7th day, 278 (66%) patients out of 420 patients on 15th day, 264 (74%) out of 356 patients on 30th day and 244 (88%) patients out of 276 patients on 90th day of treatment showed improvement in PEFr. Similarly, 310 (64%) patients out of 484 patients on 7th day, 274 (65%) patients out of 420 patients on 15th day, 240 (67%) patients out of 356 patients on 30th day and 212 (77%) patients out of 276 patients at the end (90th day) of treatment showed improvement in FEV₁ (Fig. 4). Percentage improvement in all respiratory parameters was also noted. The percentage improvement in PEFr on 7th day was 15% ($p < 0.001$), on 15th day it was unchanged i.e. 15% ($p < 0.001$), on 30th day of treatment it was 27% ($p < 0.001$) and on 90th day it was 37% ($p < 0.001$) in comparison to 0 day (Fig. 5). Similarly, percentage improvement in forced expiratory volume in one second (FEV₁) was also recorded and 14% ($p < 0.001$) improvement on 7th day, 13% ($p < 0.001$) on 15th day, 18% ($p < 0.001$) on 30th day and 27% ($p < 0.001$) on 90th day was found (Fig. 6). It was observed that maximum improvement in PEFr and FEV₁ was found on 90th day of the treatment.

Conclusion

It is well known fact that no complete cure for asthma is available in any system of medicine till date. People are looking towards alternative system of medicine with the hope of lesser effects. Keeping this in mind, potency of an herbal drug formulation was evaluated for treating patients of bronchial asthma. Results were highly encouraging and satisfactory. In bronchial asthma, the inflammation is the basic cause, which leads to hyperactivity of bronchial smooth muscles and obstruction of airways the drugs included were mucolytic, antiinflammatory, expectorant and bronchodilator. Lung function test was performed before and after the treatment to evaluate the patients.

Table 1—Unani drugs selected for clinical trial

Plants name	Reported pharmacological activities
<i>Adhatoda vasica</i> Linn.	Bronchodilator, expectorant, antihistaminic ⁷⁻¹⁵
<i>Hyssopus officinalis</i> Linn.	Anti-inflammatory, expectorant, diuretic ¹⁶⁻¹⁸
<i>Piper longum</i>	Antihistaminic, antiinflammatory, antitubercular, analgesic ^{14,17}
<i>Picrorhiza kurroa</i>	Leukotrien inhibitor, hepatoprotective, antipyretic ^{14,17-20}
<i>Linum usitatissimum</i>	Anti-inflammatory, antispasmodic, expectorant, demulcent ²¹

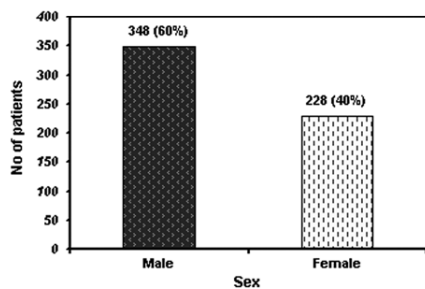


Fig.1 Sex distribution

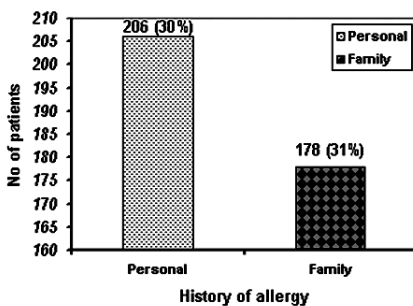


Fig.2 Family history of allergy

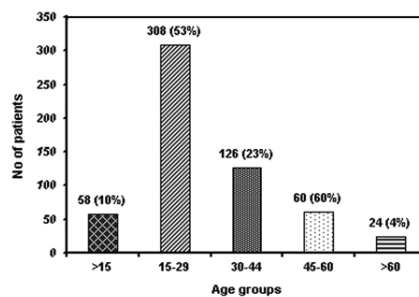


Fig.3 Age distribution

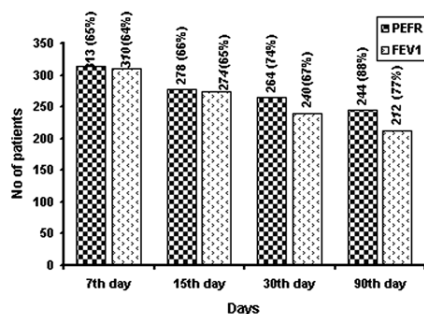


Fig.4 Improvement in PEFR & FEV1

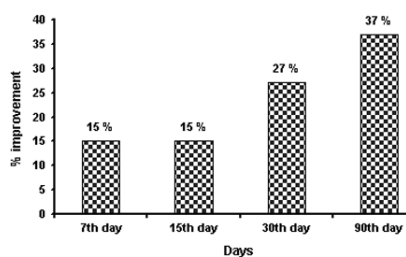


Fig.5 Percent improvement in PEFR

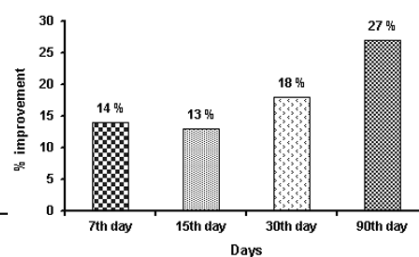


Fig.6 Percent improvement in FEV1

Both PEFR and FEV₁ parameters showed marked improvement. There was 37% improvement in PEFR after 90 days of treatment and overall 27% improvement in FEV₁. Patients not only showed increase in the parameters but also reported symptomatic relief with lesser side effects²². Nearly hundreds of herbal drugs are used in various alternative systems of medicine for the treatment of bronchial asthma. Other aspects of alternative system of medicine should also be explored, so that hidden potential of these systems could be utilized to serve the mankind and provide a complete and safe remedy for asthma.

Acknowledgement

Authors are highly thankful to the Department of AYUSH, Ministry of Health & Family Welfare, Govt of India, New Delhi, for sponsoring the study and Department of TB & Chest Diseases, JNMC, AMU, Aligarh for their extended support in clinical trial. Authors are also grateful to the Centre for Safety and Rational Use of Indian Systems of Medicine (CSRUISM), Ibn Sīnā Academy of Medieval Medicine and Sciences, Aligarh, for providing resource materials.

References

- Barnes P J, Is immunotherapy for asthma worthwhile, *N Engl J Med*, 334 (1996) 531-532.
- Gupta K B & Tandon S, Nocturnal Asthma, *Lung India*, (1) (1999) 1-5.
- Steering Committee of the International Study of Asthma, Allergy in Childhood (ISAAC), Worldwide prevalence of symptoms of Asthma, Allergic, Rhino conjunctivitis and Atopic Asthma, *Lancet*, 351 (1998) 1221-1223.
- Weiss K B & Wagenar D K, Changing Pattern of Asthma Mortality: identifying target population at risk, *J Amer Med Assoc*, 284 (1990) 1683-1687.
- Ibn Sina, *Al Qanoon-fi- tib*, (Urdu Translation by Hussain SG 1303 H), (Matab Naval Kishore Lucknow) Vol II, 60, 93, 94.
- Braunwald Fauci, Kasper E R, Hauser Longo & Jameson, *Asthma, Harrison's Principal of Internal Medicine*, Vol 2 (McGraw Hill Medical Publication Division, USA), 2005, 1512.
- Shoab A, Mannan A & Khan A B, *Arusa (Adhatoda vasica Nees) - an herbal bronchodilator*, *Cure J Unani Med*, 3 (4) (2005) 25, 26.
- Rastogi R P & Mehrotra B N, *Compendium of Indian Medicinal plants*, Vol 1, (Central Drug Research Institute Lucknow & NISCAIR, New Delhi), 1999, 10.
- Rastogi R P & Mehrotra B N, *Compendium of Indian Medicinal plants*, Vol 2, (Central Drug Research Institute Lucknow & NISCAIR, New Delhi), 1999, 15.
- Rastogi R P & Mehrotra B N, *Compendium of Indian Medicinal Plants*, Vol 3, (Central Drug Research Institute Lucknow & NISCAIR, New Delhi), 2001, 15.
- Mehta D R, Bronchodilator alkaloid from leaves of *Adhatoda vasica*, *India*, 64 (1960) 603.
- Chaudhary M K, Chemical Investigation of *Adhatoda vasica* Nees, *Naturwissenschaften*, 66 (9) (1979) 205.
- Ikram M, Chemical composition of *Adhatoda vasica*, *Pak J Sci Industrial Res*, 8 (3) (1965) 71-79.
- Chopra R N, *Indigenous Drugs of India*, (UN Dhar & Sons Calcutta), 1958, 265-266.

- 15 Rastogi R P & Mehrotra B N, *Compendium of Indian Medicinal Plants*, Vol 4 (Central Drug Research Institute Lucknow & NISCAIR, New Delhi), 1995, 394, 570.
- 16 Rastogi R P & Mehrotra B N, *Compendium of Indian Medicinal Plants*, Vol 5 (Central Drug Research Institute Lucknow & NISCAIR, New Delhi), 1998, 16.
- 17 Anonymous, *The wealth of India*, Vol 1, (Publications and Information Directorate, New Delhi), 1959, 76-78.
- 18 Kritikar K R & Basu B D, *Indian Medicinal Plants*, Vol 2, (International Books Distributions, Dehradun), 1996, 1901, 1904, 1990.
- 19 Anonymous, *The wealth of India*, Vol 8, (Publications and Information Directorate, New Delhi), 1976, 96-98.
- 20 Doshi V B, Shetge V M, Mahashul A A & Kamat S R, *Picrorrhiza kurroa* in bronchial asthma, *J Postgrad Med*, 29 (1983) 89-95.
- 21 Anonymous, *The wealth of India*, Vol 6 (Rep), (Publications and Information Directorate, New Delhi), 1998, 126.
- 22 Farkhunda Jabin, Krishna Chandra Singhal, Rakesh Bhargava, Abdul Latif & Syed Ziaur Rahman, Clinical trial of an herbal formulation and associated adverse drug reactions in patients of bronchial asthma, *J Pharmacovigilance Drug Safety*, 2 (2005) 16-19.