EVALUATION OF AN AYURVEDIC COMPOUND OF
H. SPICATUM, I. RACEMOSA AND E. OFFICINALIS FOR
THE TREATMENT OF EOSINOPHILIA IN BRONCHIAL ASTHMA

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Abstract: Background - Tamaka shvasa mentioned in Ayurvedic classics is equated with bronchial asthma. Eosinophilia is normally observed in bronchial asthma patients with range of 500 to 2000 eosinophils /µl in blood. Eosinophils are able to produce many mediators responsible for inflammatory reaction. Safer herbal formulation having anti eosinophilic effect is required to decrease the Eosinophil circulation in peripheral blood. Material and Method - Twelve freshly diagnosed cases of bronchial asthma having the eosinophil percentage between 5-24% and absolute eosinophil count between 540-1700/µl were selected for the study. An Ayurvedic compound containing Sati (Hedychium spicatum Rose), Puskaramoola (Inula racemosa Linn) and Amalaki (Emblica officinalis Linn) was administered orally in dose of 9 grams in three divided doses in powdered form along with honey. Assessment was made on the basis of Eosinophil percentage and absolute eosinophil count. Result - On treatment for 6 weeks with the trial drug, the mean percentage of eosinophil was 6, 4.25 and 2.16 was decreased to 5.6, 7.25 and 9.33 after 2, 4, and 6 weeks respectively which shows highly significant effect (p<0.001). The mean absolute count (AEC) before treatment was 942.1±136.9 which declined to 582.8, 375.5 and 218.3 at 2, 4, and 6 weeks respectively. Conclusion - The results of the clinical study confirmed the anti-eosinophilic effect of the Sati, Pusaka and Amalakichoorna which further supports the fact that it is a safe formulation for the treatment of eosinophilia in bronchial asthma.

Key words: Amalaki compound; Anti eosinophilic effect; Bronchial asthma; Eosinophilia; Sati Puskaramoola; Tamaka Shvasa;
INTRODUCTION

Symptom of breathless, cough with or without expectoration, tightness of chest, wheezing, elevated eosinophils, increased absolute eosinophil count and decreased pulmonary functions are the cardinal features observed in bronchial asthma / Tamakashvasa [1] [2] (Charaka Samhita.Chikitasa Sthana 17/55-62). Eosinophils produce various inflammatory mediators responsible for inflammation in bronchioles, broncho-constriction and vaso-permiability which leads to bronchospasm, micro vascular lavage and oedema of bronchioles. The main mediators released from eosinophils are Platelet Activating Factor, Leucotriene B₄ (LTB₄), Leucotrene C₄ (LTC₄), Prostaglandin E₂ (PGE₂) and four Cytotoxic proteins, Major Basic Protein (MBP), Eosinophil Cationic Protein (ECP), Eosinophil – Derived Neurotoxin and Eosinophil Peroxidase (EPO) [3] (Michel, et al.1987).


MATERIAL AND METHODS

Twelve patients of bronchial asthma attending the Kayachikitsa OPD of S.S. Hospital, IMS, BHU, Varanasi (India) having the eosinophil percentage ranging between 5-24% and absolute eosinophil count between 540-1700/μl were selected for the study and tried with Hedychium spicatum Rose(Sati ), Inula racemosa Linn (Puskaramoola) and Emblica officinalis Linn (Amalaki) compound.

Study Design:

Study Type: Interventional  Purpose: Treatment
Masking: Open label  Control: Not Controlled
Timing: Prospective  No of Groups: one

Inclusion Criteria:

1. Patients of either sex with age between 18 and 60 years.
2. Willing to participate in the study.
3. Bronchial asthma patients with Eosinophil percentage ranging between 5-24%
4. Absolute eosinophil count between 540-1700/μl.

**Exclusion Criteria:**

1. Tropical pulmonary Eosinophilia.
2. Helminthiasis infestation - Ascariasis
3. Aspergillosis
4. Eosinophilic Granulomatosis with Polyangiitis (Churg-Strauss Syndrome)
5. Eosinophilic Pneumonia
6. Filariasis
7. Food Allergies
8. Hyper-eosinophilic Syndrome
9. Other than Bronchial asthma patients.

**Drug Interventions**

*Preparation of Drug and Mode of Administration*

Equal parts of root of *Puskara* (Inularacemosa)[6], rhizome of *Sati* (Hedychium spicatum) [7](Sharma Pp.505-513, 2002) and seedless fruit of *Amalaki* (Emblica officinalis)[8] (Sharma PC, pp.11, 2002) were fine powdered. The effect of the drug was assessed fortnightly for a period of 6 weeks.

*Sati Puskaramoola* and *Amalaki* combination mentioned in *Charaka Samhita Chikitsa Sthana* for the treatment of *Shvasa*. Based on the following research data:


The combination was tried in eosinophilia infreshly diagnosed pateints of bronchial asthma. The clinical profile of the selected 12 patients for the present pilot study is listed in **Table -1**.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Sati-Puskaramoola-Amalaki choorna (Ref: Charaka Chikista C S 17/129).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose</td>
<td>3 grams thrice a day</td>
</tr>
<tr>
<td>Dosage form</td>
<td>Powder</td>
</tr>
<tr>
<td>Route of Administration</td>
<td>Oral</td>
</tr>
<tr>
<td>Time of Administration</td>
<td>Thrice a day 30 minutes before meals.</td>
</tr>
<tr>
<td>Anupana</td>
<td>Honey.</td>
</tr>
<tr>
<td>Duration of therapy</td>
<td>6 weeks</td>
</tr>
</tbody>
</table>
Parameters for Assessment:

Assessment was made on the basis of following laboratory investigations:-
(1). Eosinophil percentage on differential cell count (E %).
(2). Absolute eosinophil count / μl (AEC)

The effect of the drug was assessed fortnightly for a period of 6 weeks.

Table 1. Clinical profile of the study subjects (n=12). See below

RESULT

On treatment with the Sati, Puskara and Amalaki choorna, the mean percentage of eosinophil was 6, 4.25 and 2.16 respectively and the mean difference observed was 5.6, 7.25 and 9.33 at 2, 4, and 6 weeks respectively (Table-2).

Table 2. Response of Sati, Puskara and Amalaki choorna on Eosinophil percentage (n=12). See below

The mean absolute count (AEC) in 12patients before treatment was 942.1±136.9 which declined to 582.8, 375.5 and 218.3 at 2, 4, and 6 weeks respectively. The mean difference was 359.3, 558.6 and 702.5 at 2, 4, and 6 weeks respectively (Table-3).

Table-3: Response of Sati, Puskara and Amalaki choorna on Absolute Eosinophil Count (n=12). See below

DISCUSSION

Bronchial asthma is now recognised as an inflammatory disease of the air ways associated with inflammatory cell infiltration, epithelial damage and sub epithelial fibrosis. Eosinophils play an important role in the inflammatory process of the air ways which leads to the bronchial constriction. Eosinophils are able to produce many mediators responsible for bronchoconstriction, mucous secretion and alteration in vaso-permeability. The drugs like Sati, Puskara and Amalaki may be responsible for either decrease in the eosinophil count or arrest the release of inflammatory mediators. The results of the clinical study confirmed the anti-eosinophilic effect of the Sati, Puskara and Amalaki choorna. There was a significant reduction in eosinophil percentage after 2 weeks of treatment. The eosinophil percentage also came down to 2.16±1.64 after 6 weeks of treatment which was statistically highly significant. Absolute eosinophil count after treatment depicted significant decrease after 2, 4 and 6 weeks of treatment. Sati is anti inflammatory [9].(Srimal, et al. 1984), analgesic [10](Tandon et al. 1997) anti allergic and useful in Tropical Pulmonary Eosinophilia (TPE) [11] (Sahu RB.1979) and is an anti asthmatic drug [12] (Chaturvedi and Sharma, 1975). Emblica officinalis Gaertn. –Amalaki, an Ayurvedic herb useful for the ailments of Respiratory, ophthalmic, rejuvenation, inflammation, cancer, age-related renal disease, diabetes, dermatological and also in Tropical Pulmonary Eosinophilia is a best immune modulator and regulates expression of pro-inflammatory genes in bronchial epithelial cells.[13] (Nicolis E., et al 2008). Puskaramoola is having bronchodilator, anti inflammatory and antiasthmatic property[14] (N. Singh, et al 2008) and isuseful in angina pectoris.[15] (Tripathi, and Upadhya 1998). This ideal combination is significantly useful in eosinophilia and also in bronchial asthma. [16] (Sai Prasad and Upadhya, 1998).
Cough (Kasa) and breathlessness (shvasa) are cardinal symptoms of tamakashvasa. Tamakashvasa is kaphavatapre dominant disorder. Kasahara, shvasahara and kaphavata pacifying drugs are very useful in Tamaka Shvasa. Acharya Charkahas explained this model combination of three drug along with honey in patients of Shvasa in the Hikka Shavasa Chikistadyaya. Sati (H.spicatum)is having the dravyakarmukata (Pharmacological actions) of Kaphatagnag rogagnata (therapeutic indication) of kasshvahara .Sati is a kasahara drug and mentioned in Shvasahara gana in Charaka Samhita. It is indicated in Kasa, Shvasa, Hikka [(C.Su.27.155, S.S.U.51.50). Clinical studies have showed Satyadi choorna decreasing the absolute eosinophil count in asthma patients [12 ](Chaturvedi GN.1975). Amalaki mentioned in kasaharagana in Caraka Samhita, has properties of Tridosahara, Kustagna, Jvaragna, and Rasayana. Puskaramool as the best drug of choice for hikka and shvasa. On the basis of drug actions and indications,one can statethat satipuskaramoola and amalaki formulation showed a significant improvement in tamaka shvasa and has a potencial role in treatment of Eosinophilia. This combination not only relives the symptoms of breathlessness, tightness of chest, coughs with difficulty in expectoration and, wheezing but also acts as a Sampatrivighatana karana in Tamaka Shava.

CONCLUSION

Present work is only a pilot study on bronchial asthma patients having eosinophilia, mostly observed in extrinsic type of asthma. This is a novel contribution in the management of eosinophilia in bronchial asthma. It is required to further establish the anti-eosinophilic effect of the trial drug in other clinical conditions also. There is a scope for a separate clinical, biochemical, immunological study to establish the clear cut mode of action of Sati, Puskara and Amalaki combination in eosinophilia.

Acknowledgements

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Conflicts of Interest: No conflict of interest

Reference


11. **Sahu RB.** Clinical Trial of *Hedychium spicatum* in tropical pulmonary eosinophilia. *J. Nepal Pharm. Assoc* 1979;(7): (Special issue); 65-72.


**Table 1.** Clinical profile of the study subjects (n=12).

<table>
<thead>
<tr>
<th>Clinical profile</th>
<th>Blood picture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex ratio-M:F</td>
<td>TLC</td>
</tr>
<tr>
<td>Habitat:Urban: Rural</td>
<td>8.4</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>6.6</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>30.06 ± 9.6%</td>
</tr>
<tr>
<td>Monocytes</td>
<td>0.428 ± 0.69%</td>
</tr>
<tr>
<td>Eosinophilis</td>
<td>6.65 ± 5.74%</td>
</tr>
<tr>
<td>AEC</td>
<td>558.9 ± 469.9/ μl</td>
</tr>
<tr>
<td>Hb</td>
<td>34.31 ± 8.24</td>
</tr>
<tr>
<td>11.2 ± 1.05 gm/dl</td>
<td></td>
</tr>
<tr>
<td>E.S.R.</td>
<td>88.74 ± 2.16</td>
</tr>
<tr>
<td>15.17 ± 10.88 mm/hr</td>
<td></td>
</tr>
</tbody>
</table>
### Table 2. Response of Sati, Puskara and Amalaki choorna on Eosinophil percentage (n=12).

<table>
<thead>
<tr>
<th></th>
<th>M.G.S.±S.D.</th>
<th>S.E.</th>
<th>t(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT</td>
<td>1.5±5.86</td>
<td>1.69</td>
<td></td>
</tr>
<tr>
<td>AT₁</td>
<td>6.0±4.19</td>
<td>1.21</td>
<td></td>
</tr>
<tr>
<td>d₁</td>
<td>5.6±4.07</td>
<td>1.07</td>
<td>5.29(&lt;0.001)</td>
</tr>
<tr>
<td>AT₂</td>
<td>4.25±1.65</td>
<td>0.479</td>
<td></td>
</tr>
<tr>
<td>d₂</td>
<td>7.25±5.37</td>
<td>1.56</td>
<td>4.64(&lt;0.001)</td>
</tr>
<tr>
<td>AT₃</td>
<td>2.16±1.64</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>d₃</td>
<td>9.33±5.31</td>
<td>1.53</td>
<td>6.10(&lt;0.001)</td>
</tr>
</tbody>
</table>

BT: Before treatment; AT₁: After treatment of 2 weeks; AT₂: After treatment of 4 weeks; AT₃: After treatment of 6 weeks; d₁: Difference between before treatment and after treatment of 2 weeks; d₂: Difference between before treatment and treatment of 4 weeks; d₃: Difference between before treatment and treatment of 6 weeks.

### Table 3. Response of Sati, Puskara and Amalaki on Absolute Eosinophil Count (n=12).

<table>
<thead>
<tr>
<th></th>
<th>M.G.S.±S.D.</th>
<th>S.E.</th>
<th>t(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT</td>
<td>942.1±369.1</td>
<td>106.6</td>
<td></td>
</tr>
<tr>
<td>AT₁</td>
<td>582.8±247.5</td>
<td>71.5</td>
<td></td>
</tr>
<tr>
<td>d₁</td>
<td>359.3±373.3</td>
<td>107.9</td>
<td>3.33(&lt;0.001)</td>
</tr>
<tr>
<td>AT₂</td>
<td>375.5±176.6</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>d₂</td>
<td>558.6±382.5</td>
<td>110.4</td>
<td>5.06(&lt;0.001)</td>
</tr>
<tr>
<td>AT₃</td>
<td>218.3±106.6</td>
<td>30.8</td>
<td></td>
</tr>
<tr>
<td>d₃</td>
<td>702.5±320.10</td>
<td>92.5</td>
<td>7.59(&lt;0.001)</td>
</tr>
</tbody>
</table>

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