CLINICAL STUDY ON AMAVATA WITH SPECIAL REFERENCE TO JUVENILE RHEUMATOID ARTHRITIS BY PIPPALI VARDHAMANA RASAYANA

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ABSTRACT

Amavata is a very distressing disease among joint disorders. It occurs throughout the world but higher proportions of patients are seen in urban areas, and predominant in female compared to male. It is a debilitating disease in view of its chronicity and complications therefore it has taken the foremost place among the joint disorders. The most common disease involving joints in children is Rheumatoid Arthritis. The rheumatoid arthritis in children below 16 years is prefixed with the term Juvenile hence known as Juvenile Rheumatoid Arthritis by American Rheumatism Association. This study includes evaluating the efficacy of trial drugs Pippali Vardhamana Rasayana and Rasna saptak kashaya in the management of Amavata. Amavata is a challenging and burning disease for the physicians and medical field. Amavata can be compared with rheumatoid arthritis due to its similarity in clinical picture mentioned in Ayurvedic classics. As the etiopathogenesis of the disease mentioned in texts is obvious hence the Ayurvedic treatment is also specific and effective. However, till today no satisfactory modern medical management has been developed for these problems. A lot of study has been taken place in the past few decades to liberate human kind from the tremendous agony which one faces in this disease. In Ayurvedic classics also many treatment modalities like Shodhana and
Shamana Chikitsa are mentioned. Here in this study specifically focused on Samprapti Vighatanatmak Chikitsa. The drug Pippali Vardhamana Rasayana and Rasna Saptak Kashaya are chosen to evaluate its efficacy in the disease Amavata.

Key words: Amavata, Juvenile Rheumatoid Arthritis, Pippali Vardhamana Rasayana, Rasna saptak kashaya.

1. INTRODUCTION
The terms Ama and Vata unite to form the word Amavata, which are the two main pathogenic factors in the causation of disease Amavata. When Vitiated vata and ama simultaneously move towards the trika and sandhis leading to stabdhata of the body. This condition is known as Amavata. Ama and vata get vitiated due to their own respective causes to promote disease. The nidana of amavata can be Viruddha Ahara (Unwholesome Diet), Viruddha Chesta (Erroneous Habits), Mandagni (Diminished Agni) Nishchalata (Sedentary Life) Vyayama soon after the Snigdha Ahara. The accumulated ama circulate throughout the body along with vitiated vata, exhibiting an affinity to get lodged in Shleshma Sthana i.e. sandhi and immune system. There by due to action of vitiated vata, ama propelled into the whole body through the Dhamani. Then by the combined action of vata, pitta and kapha, ama becomes more vitiated further with the interaction of tridoshas. So after the lodging of ama and vitiated vata dosha-dushya sammurchana starts in the sandhisthana. The features of the pain present in the sandhi is typical like Scorpion string and other symptoms like Stabdhata, Sandhisoola, Sandhisotha, Sparsasahata Trisna, Gaurava, Gatrastabdhatra, Agnimandya, Apaka, Angamarda, Aruchi and Jwar are found in this disease. Juvenile Rheumatoid Arthritis (JRA), also often referred to as Juvenile Idiopathic Arthritis (JIA) or Juvenile Chronic Arthritis (JCA), is a chronic autoimmune inflammatory disorder affecting children and adolescents. It is the most common chronic disease affecting children. Juvenile Rheumatoid Arthritis is a significant cause of pain and impaired mobility as well as depressed growth in children. It is characterized by a synovitis of the peripheral joints manifesting in soft tissue swelling and effusion. The Trail drug Pippali Vardhamana Rasayana and Pippali Vardhamana Rasayana along with Rasna saptak kashaya will be work on disease amavata and breakdown the samprapti of amavata.

2. AIMS & OBJECTS
A. Preparation of Pippali Vardhamana Rasayana and Rasna saptak kashaya.
B. Clinical study on management of Amavata by Pippali Vardhamana Rasayana and Rasna saptak kashaya.

3. MATERIALS & METHODS

Step 1: preparation of Pippali Vardhamana Rasayana

Materials
A. *Pippali* (*Piper longum* Linn.) - 500 mg to 3 gm, Cow milk – 150 ml, Water – 150 ml.
B. *Pippali* (*Piper longum* Linn.) - 3 gm to 5 gm, Cow milk – 300 ml, Water – 300 ml.
C. *Pippali* (*Piper longum* Linn.) - 5 gm to 7 gm, Cow milk – 450 ml, Water – 450 ml.

METHOD

After mixing the *Pippali*, water and cow milk, it is boiled up to *Ksheera Avashesha* and administered.

Step 2: preparation of Rasna saptak kashaya

Materials
B. Shunthi (*Zinzibar officinale*) – 1 gm as a praksepa dravya.

METHOD

All seven ingredients are taken in equal quantity and to make coarse powder. This powder should be mixed with 16 times of water and boiling on low flame with constant stirring to reduce the 1 / 4th, after that it should be filtered using cloth and collected in clean sterile container.

Step 3: Clinical study on management of Amavata by Pippali Vardhamana Rasayana and Rasna saptak kashaya

The patients were selected from the OPD/IPD of the Department of Kaumarabhritya (Bal Roga Unit), S.V. Ayurved Hospital, Tirupati. 24 patients were registered for the present study. Cases were treated with the firstly *Pippali Vardhamana Rasayana* for 13 days and then treated with the *Pippali Vardhamana Rasayana* and *Rasna saptak kashaya* for 53 days. Initial dose of *Pippali choorna* in *Pippali Vardhamana Rasayana* will be given according to the *Vaya* (Age) of the patient. The dose of *pippali choorna* will be 500mg for (7-10 yrs.), 800mg
for (11-13 yrs.) and 1000mg for (14-16 yrs.). Initial dose will be doubled on the next day. Thus the dose will be increased up to 7th days, from 8th day onwards the dose is decelerated in the same manner as in case of increase up to 13 days. The dose of *Rasna Saptak Kashaya* will be 7-10 ml for (7-10 yrs.), 10-15 ml for (11-13 yrs.) and 15-20 ml for (14-16 yrs.) TID.

**A. Inclusion Criteria**

1. Diagnosed patients of *Amavata* bearing the classical *lakshanas*.
2. Observation of symptom profile of the patient of Rheumatoid Arthritis (Diagnosis as per the American College of Rheumatology Criteria 1987).
3. Patients between the ages of 7-16 yrs. of age.

**B. Exclusion Criteria**

1. Age more than 16 years, Patients having other depilatory disease.
2. Chronicity for more than 5 years.
3. Having severe crippling deformity.
4. Having Cardiac disease, Pulmonary Tuberculosis, Diabetes mellitus.

**C. Investigation**

To exclude the other pathologies and to assess the disease activity, following investigations were carried out before and after treatment.

1. **Hematological**
   - (a) Hemoglobin (Hb.) and RBC count
   - (b) Total and Differential Leukocyte count (TLC and DLC)
   - (c) Erythrocyte Sedimentation Rate (ESR)

These routine investigations of blood were carried out before and after treatment.

2. **RA factor**

The serum of the patient was tested for Rheumatoid factor to assess the severity of the disease activity.

3. **Radiological examination** – For the assessment and detection of articular changes, for the confirmation of diagnosis and to grade the disease, the radiological examination were carried out of affected joints. (If needed)
D. Parameter with gradation Score of Amavata

**Stabdhatā (Morning Stiffness)**
No Stiffness - 0, Stiffness lasting for 20 min to 2 hours - 1, Stiffness lasting for 2 hrs to 5 hours - 2, Stiffness lasting for more than 5 hours - 3.

**Sandhi Ruja (Joint Pain)**
No pain - 0, Mild - bearable pain - 1, Moderate - Frequently complain of pain with painful look - 2, Moderate - Difficulty in joint movement, excruciating pain with painful cries - 3.

**Sandhi Shotha (Joint Swelling)**
No Swelling – 0, Mild - Not marking the bony landmarks of joints – 1, Moderate - Just covering the bony prominence – 2, Moderate - Considerable above the landmarks may be with positive fluctuation (Huge Swelling) – 3

**Sparshasahyata (Tenderness)**
Patients say the joint is tender – 0, The patient’s winces – 1, The patients wince and withdraw the affected part – 2, The patients will not allow to touching the joint – 3

E. General symptoms and associated symptoms of Amavata
General symptoms like Angamarda, Aruchi, Trishna, Aalasya, Gaurava, Jwara, Apaka, and Associated symptom like Agnidaurbalya, Bahumutratam, etc. were scored as mentioned below, Symptoms observed before treatment – 2, Mild relief after treatment – 1, Complete relief after treatment – 0, No improvement after treatment – 2

F. Total effect of therapy
The obtained results were measured according to the grades given below.
Remarkable Improvement - 100% relief, Marked Improvement - ≥75% relief, Moderate Improvement - 50 % to 75 % relief, Mild Improvement - 25 % to 50 % relief, Unchanged - <25 % or No relief.

G. Statistical Analysis
The information gathered on the basis of above observations was subjected to statistical analysis in terms of mean (x), standard deviation (S.D.) and standard error (S.E.) and Paired ‘t’ test was carried out at P>0.05, P<0.01 and P<0.001 levels. The obtained results were interpreted as Insignificant P > 0.05 ns, Significant P < 0.01, Highly Significant P < 0.001 **
4. OBSERVATION

I. Stabdhatā
It is observed that the application of student’s paired t-test after 13 days that there is significant effect of *Pippali Vardhamana Rasayana* treatment with reference to *Stabdhatā*. The corresponding t-value is given by 6.78 which are highly significant. (*P*<0.001) and application of student’s paired t-test after 56 days that there is significant effect of *Pippali Vardhamana Rasayana* followed by *Rasna Saptak Kashaya* treatment with reference to *Stabdhatā*. The corresponding t-value is given by 11 which are highly significant. (*P*<0.001)

II. Sandhisshoolā
It is observed that the application of student’s paired t-test after 13 days that there is significant effect of *Pippali Vardhamana Rasayana* treatment with reference to *Sandhisshoolā*. The corresponding t-value is given by 4.05 which are highly significant. (*P*<0.001) and application of student’s paired t-test after 56 days that there is significant effect of *Pippali Vardhamana Rasayana* followed by *Rasna Saptak Kashaya* treatment with reference to *Sandhisshoolā*. The corresponding t-value is given by 7.52 which are highly significant. (*P*<0.001)

III. Sandhishothā
It is observed that the application of student’s paired t-test after 13 days that there is significant effect of *Pippali Vardhamana Rasayana* treatment with reference to *Sandhishothā*. The corresponding t-value is given by 15.90 which are highly significant. (*P*<0.001) and application of student’s paired t-test after 56 days that there is significant effect of *Pippali Vardhamana Rasayana* followed by *Rasna Saptak Kashaya* treatment with reference to *Sandhishothā*. The corresponding t-value is given by 8.99 which are highly significant. (*P*<0.001)

IV. Sparsasahata
It is observed that the application of student’s paired t-test after 13 days that there is significant effect of *Pippali Vardhamana Rasayana* treatment with reference to *Sparsasahata*. The corresponding t-value is given by 6.15 which are highly significant. (*P*<0.001) and application of student’s paired t-test after 56 days that there is significant effect of *Pippali Vardhamana Rasayana* followed by *Rasna Saptak Kashaya* treatment with reference to *Sparsasahata*. The corresponding t-value is given by 11 which are highly significant. (*P*<0.001)
V. Overall effect of therapy

The assessment of the effect of *Pippali Vardhamana Rasayana* treatment 4.2% patient show remarkable improvement. Marked and Moderate improvement seen in 25% of the patients, 29.2% patients Mild and 16.6% patients show unchanged improvement. The assessment of the overall effect of the treatment revealed that 20.8% of the patients show remarkable improvement. Markedly improvement was seen in 29.2% of the patients. 20.8% of patient responded moderately, 16.7% of the patients show mildly improved and remaining 12.5% patients got no relief.

![Graph showing overall effect of therapy](image)

**Fig.-1 Overall effect of therapy**

| Table 1: Effect of treatment on *Stabdhata* |
|-----------------|----------------|-----------------|-------|---------|-------|
| **Days**        | **Mean**       | **%**           | **SD ±** | **SE ±** | **t**  |
|                 | **BT**         | **AT**          | **BT-AT**|          |       |
| 0-13 days       | 1.66           | 1.00            | 0.66     | 40       | 0.48  | 0.09  | 6.78** |
| 14-56 days      | 1.66           | 0.75            | 0.91     | 55       | 0.40  | 0.08  | 11**   |

| Table 2: Effect of treatment on *Sandhisshoola* |
|-----------------|----------------|-----------------|-------|---------|-------|
| **Days**        | **Mean**       | **%**           | **SD ±** | **SE ±** | **t**  |
|                 | **BT**         | **AT**          | **BT-AT**|          |       |
| 0-13 days       | 1.88           | 1.46            | 0.42     | 22.22    | 0.50  | 0.10  | 4.05** |
| 14-56 days      | 1.88           | 0.92            | 0.96     | 51.11    | 0.62  | 0.12  | 7.52** |
Table 3: Effect of treatment on Sandhishotha

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<th>SD ±</th>
<th>SE ±</th>
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<td>BT AT BT-AT</td>
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<tr>
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Table 4: Effect of treatment on Sparsasahata

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<tr>
<td>0-13 days</td>
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<td>0.49</td>
<td>0.10</td>
<td>6.15**</td>
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<td>14-56 days</td>
<td>1.75 0.83 0.92</td>
<td>52.38</td>
<td>0.41</td>
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Table 4: Overall effect of therapy

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<th>Moderately Improved</th>
<th>Mildly Improved</th>
<th>Unchanged</th>
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<tr>
<td></td>
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<tr>
<td>After 13 days</td>
<td>1 4.2</td>
<td>6 25</td>
<td>6 25</td>
<td>7 29.2</td>
<td>4 16.6</td>
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<tr>
<td>After 56 days</td>
<td>5 20.8</td>
<td>7 29.2</td>
<td>5 20.8</td>
<td>4 16.7</td>
<td>3 12.5</td>
<td></td>
</tr>
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Fig.-2 Pippali, Rasna, Amrita, Punarnava

Fig.-3 Devadaru, Trikantaka, Erandamool, Aaragvadha
4. DISCUSSION

After 13 days of follow up period Pippali Vardhamana Rasayana shows highly significant relief (P<0.001) in the management of all the pradhana lakshanas of Amavata i.e. Stabdhata, Sandhisoola, Sandhisotha and Sparsasahata with a relief of 40%, 22.22%, 46.80% and 35.71% respectively. After 56 days of therapy trial drug provide highly significant relief (P<0.001) in the management of all the pradhana lakshanas of Amavata i.e. Stabdhata, Sandhisoola, Sandhisotha and Sparsasahata with a relief of 55%, 51.11%, 61.70% and 52.38% respectively.

**Stabdhata:** Stabdhata caused due to spreading of Ama throughout the body by vitiated Vata. Pippali have the property of Deepan-pachana, Laghu, Tikshna guna and Katu rasa to increase the Agni and digest the Ama as well as Srotosodhak. Rasna Saptak Kashaya has Ushna Virya pradhana, Vata shamak property to reduce the Stabdhata in joints.

**Sandhisoola:** In Amavata, Vitiation of Asthi and Majjagata Vata causes pain in Sandhi. Pippali has affinity to all 7 dhatus acts as Rasayana to provide nutrition of all Sandhis, and Rasna Saptak Kashaya has Tikta rasa pradhanya, Vata-Kaphahara and Ushna Virya to reduce the Soola in Sandhis. **Sandhisotha:** Sandhisotha caused when vitiated Ama and Tridosha afflicts Twaka, Rakta and Mamsa in joints. Pippali acts as Ama pachana, Tridoshahar and Srotosodhak property and Rasna Saptak Kashaya has Vata-Kaphahara, Ushna Virya and Madhura Vipaka to reduce the shotha in joints. **Sparsasahata:** In Amavata Ama and vata dosha is more influenced in joints. Pippali have Vatakaphashamak and Srotosodhak property and Rasna Saptak Kashaya have vata-kaphahar to reduce the soola and shotha in the joints. **Angamarda:** In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows highly significant relief (P<0.001) in the management of samanya lakshana of Amavata i.e. Angamarda with a relief of 47.50% and after 56 days of
therapy trial drug provide highly significant (P<0.001) with relief of 60%. Main causative factor of Angamarda is Dhatu-daurbalya and Vata prakopa. Pippali work as Rasayana provide the proper nourishment of all 7 Dhatus. Rasna Saptak Kashaya is Vata-shamak due to Ushana Virya and Madhura Vipaka provides relief in Angamarda. Aruchi: In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows significant relief (P<0.01) in the management of samanya lakshana of Amavata i.e. Aruchi with a relief of 24% and after 56 days of therapy trial drug provide significant (P<0.01) with relief of 40%. Ama vitiates of Rasa Dhatu and Bodhaka Kapha impairs the function of Rasanendriya. Pippali is best deepan-pachan to improve the Agni and Rasna Saptak Kashaya is a Tikta rasa pradhan, Kaphahara and Ushna Virya Kashaya to digest the Ama and provide relief in Aruchi. Trishna: In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows significant relief (P<0.01) in the management of samanya lakshana of Amavata i.e. Trishna with a relief of 27.27% and after 56 days of therapy trial drug provide significant (P<0.01) with relief of 36.36%. Trishna is due to Agnidushti, Sama Pitta and Vata. It shows Rasavaha, Udakavaha srotodushti in disease process. Pippali has Anushnasheeta Virya and proper formation of Rasa dhatu to open the Rasavaha Srotas give relief in Trishna. Alasya: In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows significant relief (P<0.01) in the management of samanya lakshana of Amavata i.e. Alasya with a relief of 25% and after 56 days of therapy trial drug provide highly significant (P<0.001) with relief of 53.12%. Ama produces Alasya by Srotharodha. Pippali digest the Ama open the channel of srotas provide proper nourishment of dhatu to give relief in Alasya. Gaurava: In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows significant relief (P<0.01) in the management of samanya lakshana of Amavata i.e. Gaurava with a relief of 46.43% and after 56 days of therapy trial drug provide highly significant (P<0.001) with relief of 57.14%. Ama has Guru and Picchila guna produce Gaurava. Pippali have Katu Rasa, Kapha shamak and Laghu, Tikshna guna to digest the Ama. Rasna Saptak Kashaya has property of Katu Rasa, Kaphahara, and Ushna Virya against Ama. Jwara: In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows significant relief (P<0.01) in the management of samanya lakshana of Amavata i.e. Jwara with a relief of 50% and after 56 days of therapy trial drug provide significant (P<0.01) with relief of 64.29%. Agnimandya and Rasa Dhatu Dushti produce Jwara in the body. Proper formation of Adhya dhatu rasa to give relief in Jwara. Apaka: In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows highly significant relief (P<0.001) in the management of
samanya lakshana of Amavata i.e. Apaka with a relief of 64.58% and after 56 days of therapy trial drug provide highly significant (P<0.001) with relief of 68.75%. Ama and Kapha causes Srotorodha leads to Mandagni and causes Apaka. Due to lack of gastric and enzymatic secretion, Agni is hampered by which Ama formation occur cause Apaka. Ama is Apakva substance which is formatted by Jatharagnimandya and Dhatvagnimandhya. Pippali increase the gastric secretion and Ushna Virya pradhan Rasak Saptak Kashaya digest the Ama to give relief in Apaka. **Agnimandhya:** In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows highly significant relief (P<0.001) in the management of samanya lakshana of Amavata i.e. Agnimandhya with a relief of 68.75% and after 56 days of therapy trial drug provide highly significant (P<0.001) with relief of 77.08%. Agnimandhya is an important factor to cause the disease Amavata. Pippali have the quality of Deepan-pachana, Katu Rasa with Laghu Tiksha guna and Rasak Saptak Kashaya has Tikta rasa pradhanya, Kaphahara and Ushna Virya Kashaya to increase the Agni and give relief in Agnimandhya. **Bahumutrata:** In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows significant relief (P<0.01) in the management of samanya lakshana of Amavata i.e. Bahumutrata with a relief of 38.89% and after 56 days of therapy trial drug provide significant (P<0.01) with relief of 55.56%. In Amavata presence of vitiated Ama causes Sroto –Abhisyanda in the body, which leads to increase of Kleda. Due to Deepan-pachana, Agnivardhan and Srotosodhan property of Pippali it digests the Ama provides significant relief in Bahumutrata. **Discussion on ESR:** In present study after 13 days of follow up period Pippali Vardhamana Rasayana shows significant relief (P<0.01) in ESR with a relief of 20.67% and after 56 days of therapy trial drug provide highly significant (P<0.001) with relief of 37.93%. Erythrocyte sedimentation rate is increased in almost all the patients of Rheumatoid Arthritis due to autoimmune phenomena. Pippali Vardhamana Rasayana acts against autoantibody, increase the immune complex, and provide symptomatic relief with decrease the ESR. In present study 3 patients have unchanged improvement because Srothas was fully obstructed by Ama and health of patients was very poor. After use of Pippali Vardhamana Rasayana mild relief in Agni but still Ama condition persist. After use of Rasak Saptak Kashaya they get mild relief in Samanya Lakshanas.

5. **CONCLUSION**

Amavata is one of the most challenging problem that makes the patient weep in agony of pain and reduces functional capacity with severe stiffness and crippling deformities of joints making them bed ridden. After completion of present study and analyzing different criteria’s
following conclusion can be drawn, Pippali is the best Rasayana Dravya, and guna of pippali (i.e. Dipana, Pachana, Laghu, Tikta, Madhura Vipaka, Anushnasheeta Virya) help to break the samprapti of Amavata. The trial drug Pippali Vardhamana Rasayana and Rasna Saptak Kashaya is effective in the management of Amavata with respect to its different features. Pippali Vardhamana Rasayana has provided better relief in most of the Cardinal, General, Associated features and ESR of the disease at significant level. Also better relief was observed in Rasna Saptak Kashaya as Vatahara treatment at significant level. Trial drug did not show any intolerance or adverse effect during the course of treatment in any of the patients. The trial drug is safe and effective in oral formulation in the management of Amavata.

6. REFERENCES
