A clinical evaluation of Rajata Bhasma and Shankhpushpi syrup as medhya

Pritika Devi1, C.P. Kashyap2
1 Lecturer, Department of Rasa Shastra and Bhaishajya Kalpana, Babe ke Ayurvedic Medical and Hospital, Daudhar Moga, Punjab, India
2 Ex Professor, Department of Rasa Shastra and Bhaishjaya Kalpana, Rajiv Gandhi Ayurvedic Medical and Hospital, Paprola (H.P.), India

ABSTRACT

Use of metallic (dhatu varga) preparations in health care is one of an irreplaceable feature in Ayurveda system of medicine. In ancient times, processed minerals, metals including Parada, Swarna, Rajata, etc were used very frequently by Acharyas in different diseases conditions with great authority. It is generally claimed that these metals are purified and detoxified by the various procedures used for formulations which are described especially in the classical texts of Rasa Shastra and Bhaishajya kalpana. Rajata in itself is comparatively less explored but best advocated for Medha, Smritikara, Matikaranam, Unmaadhurar, Apasmarhara, Naadi Dorbalyakara (Nervous system disorders) and Rasayana (wellbeing) according to our Rasavaidyas. Along with the classical formulations, in Rasa Shastra & Bhaishajya Kalpana, there is need to study and develop existing & new modern pharmaceutical products out of different raw material of Ayurveda formulations, those are more acceptable, palatable, stable & keeping therapeutic potency intact. So Shankhpushi Syrup for the study has been selected. The mental health of the individual plays a significant role in the well-being of a person. Ayurveda also defines health as a state of mental, physical & spiritual wellbeing, which was acclaimed by W.H.O as features of a healthy individual. Keeping these views in mind, A complete & combined therapy; Rajata Bhasma and Shankhpushpi syrup as Medhya was given and result was significant.

Keywords: Bhasma, Rajata, Shankhpushpi, Syrup, Medhya, Mental Health.

INTRODUCTION

Various herbs, metals or minerals are heated at high temperature for red hot or melting state and then quenched in suitable media like herbal juices, decoction for specified times. The bhasma is obtained by repeating these processes to several times and reduced toxic effect of metals that are not only nullified but are transformed into biological active nanoparticles. When the various bhasma viz. swarna bhasma, makshika bhasma, tamra bhasma etc. were subjected to analysis to under electron microscope it was found they are similar to nanocrystalline materials possessing similar physio-chemical properties. So, the therapeutic effect of bhasma may attributed to large surface area of materials and small particle size by which they can easily transported to specified target sites. Hence the use of metals & minerals became the strength of Ayurvedic therapeutics. Being in the speciality of Rasa Shastra the pharmaceutical work on classical Ayurveda formulation is always knowledgeable and interesting. Rajata in itself is comparatively less explored and best advocated in classics for Medha, Smritikara, Matikaranam, Unmaadhurar, Apasmarhara, Naadi Dorbalyakara (Nervous system disorders) and Rasayana (wellbeing).

Along with the classical formulations, in Rasa Shastra & Bhaishajya Kalpana, there is need to study and develop existing & new modern pharmaceutical products out of different raw material of Ayurvedic formulations, those are more acceptable, palatable, stable & keeping therapeutic potency intact. So Shankhpushi Syrup for the study has been selected. In classical texts, while describing various mental functions and disorders, the word ‘Medha’ has been quoted. Medha is further differentially studied as Dhee, Dhriti and Smriti [2]. Though, the ‘Smriti’ described as the characteristics features of Atma [3], which is closely related with the Manas. Without proper functioning of Manas nothing can be remembered or recall because the first phase of memory is registration of the information which comes through various kind of perceptions and without Manas, perception is not possible. This is how Manas plays active part in the process of ‘Dhee, Dhriti and Smriti’ [4]. Keeping these views in mind, A complete & combined therapy; Rajata Bhasma and Shankhpushpi syrup as Medhya was supposed result oriented, that was expected to roll down to the field and patients from lab and thesis, if encouraging results found.
Aims and Objectives

To study the therapeutic efficacy of Rajata Bhasma with Shankhpushpi syrup as Medhya.

MATERIALS AND METHOD

Selection of the patients

A total no. of 10 volunteers was selected for the present study from OPD of Ras-Shastra Department of Rajiv Gandhi Govt. Post Graduate Ayurvedic College & Hospital, Paprola Distt. Kangra (H.P.) irrespective of their sex, religion and socio-economic status. These 10 individuals were taken to see the memory booster effects in healthy individuals. All the selected individuals were studied under single group.

Criteria of diagnosis

The patients were diagnosed on the basis of an objective criteria “PGI memory scale” which includes different tests to evaluate the different types of memory.

Inclusion criteria

1. Patient’s willing to participate in the trial.
2. Age between 16-60 years, irrespective of sex, education and socio-economic status.
3. Healthy volunteers who wished to improve their memory.
4. Uncomplicated cases of memory disorder.
5. Only those volunteers have been included who have fulfilled the objective criteria of diagnosis.

Exclusion criteria

1. Patients unwilling to participate in the trial.
2. Patients presenting with complications like mental retardation or psychoneurosis.
3. If the condition of a patient deteriorated during the trial, the patient was excluded from the study.

Laboratory Investigations

The Routine haematological and biochemical tests were carried out before and after the clinical trial.

Criteria of diagnosis

The patients were diagnosed on the basis of an objective criteria “PGI memory scale” which includes different tests to evaluate the different types of memory.

Criteria for Assessment

The efficacy of the medicine given was assessed on the basis of Improvement in total score which was assessed by ‘Memory Scale’.

Criteria for Categorization

A difference in improvement in terms of percentage of total memory score were recorded as follows:

**Highly Improved**

> Improvement in total memory score > 15 %

**Improved**

> Improvement in total memory score between 15 to 10 %

**Mild Improved**

> Improvement in total memory score between 5 to 10%

**Not Improved**

> Improvement in total memory score between 1 to 5 %

**Deteriorated**

> Reduction in memory score

Method Of Study

All the volunteers selected for the study were explained the nature of the study. Their consent was obtained in the history Performa before inclusion in the study. The history Performa was completed for each patient in whom following information was recorded:

> Complete bio-data of the patient
> Duration of chief complaints
> History
> General physical examination
> Systemic examination

Trial group

Total 10 volunteers were selected for the present study who were fulfilled the criteria of diagnosis and consented for the study. All the selected volunteers were studied under single group.

Dose: Rajata Bhasma was given in a dose of 100mg O.D. with Luke warm water Shankhpushpi syrup 10ml B.D.

Duration of trial: 30 days

Follow – up Studies: The patients were advised to come after 15 days.

The total duration of trial was 30 days. Laboratory investigations were done at the beginning and the end of the trial.

OBSERVATIONS AND RESULT

Disturbances in different type of Memory Subtests of PGI Memory Scale in the volunteers at the time of registration:

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Types of Memory</th>
<th>No. of volunteers (N=10)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Remote memory</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>2.</td>
<td>Recent memory</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>3.</td>
<td>Mental balance</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>4.</td>
<td>Attention and Concentration</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>5.</td>
<td>Delayed recall</td>
<td>9</td>
<td>90</td>
</tr>
<tr>
<td>6.</td>
<td>Immediate recall</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>7.</td>
<td>Verbal retention for similar pairs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8.</td>
<td>Verbal retention for dissimilar pairs</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>9.</td>
<td>Visual retention</td>
<td>9</td>
<td>90</td>
</tr>
<tr>
<td>10.</td>
<td>Recognition</td>
<td>3</td>
<td>30</td>
</tr>
</tbody>
</table>

|
Effect of Trial Drug over total memory score in the Volunteers:

<table>
<thead>
<tr>
<th>Subtests</th>
<th>Memory Score</th>
<th>% Improvement</th>
<th>SD</th>
<th>'p' value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BT</td>
<td>AT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote Memory</td>
<td>4.7</td>
<td>5.50</td>
<td>17.02</td>
<td>0.422</td>
</tr>
<tr>
<td>Recent memory</td>
<td>4.40</td>
<td>5.00</td>
<td>13.63</td>
<td>0.699</td>
</tr>
<tr>
<td>Mental balance</td>
<td>7.60</td>
<td>7.90</td>
<td>3.94</td>
<td>0.675</td>
</tr>
<tr>
<td>Attention &amp; Concentration</td>
<td>10.50</td>
<td>11.60</td>
<td>10.47</td>
<td>1.524</td>
</tr>
<tr>
<td>Delayed recall</td>
<td>7.300</td>
<td>8.20</td>
<td>12.32</td>
<td>0.568</td>
</tr>
<tr>
<td>Immediate recall</td>
<td>9.00</td>
<td>10.30</td>
<td>14.44</td>
<td>1.160</td>
</tr>
<tr>
<td>Verbal Retention in Similar pair</td>
<td>5.00</td>
<td>5.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Verbal Retention in dissimilar pair</td>
<td>5.40</td>
<td>8.80</td>
<td>62.96</td>
<td>2.319</td>
</tr>
<tr>
<td>Visual Retention</td>
<td>8.80</td>
<td>10.0</td>
<td>13.63</td>
<td>1.476</td>
</tr>
<tr>
<td>Recognition</td>
<td>9.60</td>
<td>10.0</td>
<td>4.16</td>
<td>0.699</td>
</tr>
</tbody>
</table>

Observations from above table

- In Remote memory subtest, 17.02% improvement was found which is statistically highly significant (<0.001).
- In Recent memory subtest, 13.63% improvement was found which is statistically significant (<0.05).
- In Mental Balance subtest, improvement was only 3.4% which is non-significant (>0.05).
- Only 10.47% improvement was found, in Attention and Concentration subtest which indicates statistically significant result (<0.05).

Effect of trial medicine on Haematological Investigations

No considerable change in haematological investigations were noted as a result of therapy

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>%age Change</th>
<th>p- value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BT</td>
<td>AT</td>
<td></td>
</tr>
<tr>
<td>Hb (gm%)</td>
<td>13.090</td>
<td>13.100</td>
<td>0.07</td>
</tr>
<tr>
<td>TLC/cu mm</td>
<td>6.21</td>
<td>6.17</td>
<td>0.64</td>
</tr>
<tr>
<td>DLC (%)Lymphocytes</td>
<td>29.56</td>
<td>29.49</td>
<td>0.23</td>
</tr>
<tr>
<td>Mixed</td>
<td>8.42</td>
<td>10.80</td>
<td>28.26</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>62.02</td>
<td>59.71</td>
<td>3.72</td>
</tr>
<tr>
<td>ESR</td>
<td>7.60</td>
<td>9.40</td>
<td>23.68</td>
</tr>
<tr>
<td>SGOT</td>
<td>17.90</td>
<td>21.80</td>
<td>21.78</td>
</tr>
<tr>
<td>SGPT</td>
<td>21.30</td>
<td>25.50</td>
<td>19.71</td>
</tr>
<tr>
<td>FBS(mg/dl)</td>
<td>92.00</td>
<td>90.30</td>
<td>1.84</td>
</tr>
<tr>
<td>B. Urea (mg/dl)</td>
<td>22.60</td>
<td>22.60</td>
<td>0</td>
</tr>
<tr>
<td>S. Creatinine (mg/dl)</td>
<td>0.790</td>
<td>0.870</td>
<td>10.12</td>
</tr>
<tr>
<td>Lipid Profile(mg/dl)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T. Cholesterol</td>
<td>149.6</td>
<td>148.8</td>
<td>0.53</td>
</tr>
<tr>
<td>S. Triglycerides</td>
<td>124.0</td>
<td>129.4</td>
<td>4.11</td>
</tr>
<tr>
<td>HDL</td>
<td>42.90</td>
<td>40.10</td>
<td>6.52</td>
</tr>
<tr>
<td>VLDL</td>
<td>24.80</td>
<td>25.90</td>
<td>4.43</td>
</tr>
<tr>
<td>LDL</td>
<td>89.70</td>
<td>83.20</td>
<td>7.24</td>
</tr>
</tbody>
</table>
Overall Effect Of The Therapy: Total memory score for all subtests is 101.

It can be calculated as: Improvement in score (AT-BT)/ total memory score * 100

<table>
<thead>
<tr>
<th>Overall Effect</th>
<th>No. of Cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Improved (&gt;15%)</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Improved (&gt;10%)</td>
<td>06</td>
<td>60%</td>
</tr>
<tr>
<td>Mild Improved (&gt;5%)</td>
<td>04</td>
<td>40%</td>
</tr>
<tr>
<td>No Improvement</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Deteriorated</td>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>

DISCUSSION

Remote memory: In Remote memory subtest 17.02% improvement was found which is statistically highly significant (<0.001). It may be due to sheer virya property of Rajata Bhasma [5] and Shankhpushpi [6], which nourishes the Kapha dosha, for enhancing the dhriti karma [1] or retention property.

Recent memory: In Recent memory subtest, 13.63% improvement was found which is statistically significant (<0.05). It may be due to kashaya Rasa of Rajata Bhasma [5] and Tikat, Katu, Kashaya rasa of Shankhpushpi for the proper functioning of Udaan vayu [1] as it aggravates the smriti karma.

Mental balance: In Mental Balance subtest, improvement was only 3.4% although it was statistically non-significant (<0.05) might have due to short duration of trial. The reason behind the improvement it may be the madhura vipaka [5] of both trial drugs, as it may normalize the Pitta dosha and further it may nourishes the Sadhak pitta [9] for perception of objects.

Attention and concentration: Only 10.47% improvement was found, in Attention and Concentration subtest, which indicates statistically significant result (<0.05). In this test particular, dheer (perception) and smriti (recalling) type of medhya can be included. Amla rasa of Rajata Bhasma and katu rasa of Shankhpushpi may nourishes the prakaritaka karma of pitta dosha i.e. Dhee [10], Katu, Tikat, Kashaya rasa of Shankhpushpi [8] and Kashaya Rasa of Rajata bhasma [5] may help in Udaan vayu [8] for its smriti karma.

Rajata bhasma and Shankhpushpi by virtue of madhura vipaka might have helpful in correcting the vitiated Vaat dosha and Pitta dosha.

Immediate recall: In Immediate Recall subtests, 14.44% improvement was found respectively which shows highly significant result (<0.001), garahan shakti or dheer [10] may be due to ashu and tikshana guna of Pitta dosha it may helpful in subjective perception, Amla rasa of Rajata Bhasma and tikat, katu rasa of Shankhpushpi may useful in dheer karma of Pitta dosha. Madhura vipaka of both drugs might have helped to normalise the vitiated Pitta dosha as Medha is prakarit karma [11], (Ch.Su 18/50.)

Delayed recall: Only 12.32% improvement was found, which shows highly significant result (<0.001). The improvement was found in perception and recalling of subjects it may be due to prakriti karma of Pitta dosha [14] and Udaan vayu [16].

Verbal retention for similar pair: In Verbal Retention for Similar pair subtest, no change was found, though patients were scored full marks.

Verbal retention for dissimilar pair: In Verbal Retention for dissimilar Pair subtest, 62.96% improvement was found which is highly statistically significant (<0.001) result. Grahana (Dheer) [10] and Dharana (dhriti) [7] may be amla rasa of Rajata bhasma and katu, tikat rasa of Shankhpushpi nourishes the prakaritaka karma of Pitta i.e. Dhee. Madhura rasa of Rajata bhasma, madhura vipaka both drugs helps in maintaining the dharana (dhriti) prakarit karma of Kapha dosha.

Visual: In Visual Retention Subtest, 13.63% improvement was found which is statistically significant (<0.05) in result. The dheer [10] (perception) and smriti [9] (recall) types of medhya were used for this type of subtest. It may only helpful when vaat and Pitta dosha will be in balance state. Kashaya, katu, tikat rasa may helpful for nourishment.

Recognition: In Recognition subtest, mean score before treatment was 9.60 and after treatment was 10.0 with percentage relief was only 4.16%, although observations were statistically non-significant. All these Grahana and Dharana Shakti of visual subject may be because of its Pitta Shamaka property of madhura vipaka hence normalise the Alokachka Pitta which resides in Chakshu [12].

CONCLUSION

Since Rajata bhasma have attained Sara, Lekhana guna [5] or its microsized particles may penetrate the microchannels so that it may have shown the synergistic effect with Shankhpushpi syrup as Medhya. As Medhya comprises of three mental faculties dheer, dhriti, smriti and these are interrelated with each other. The karma of Rajata bhasma might have balance their natural phenomenon by maintaining involved strotas i.e. manoavaha satrotas.

Rajata bhasma is also known to be Smritikar, Medhyakar,Bharmhar, Apasmarhar, Unmadhar by various Ayurveda Acharyas. By virtue of its Smritivardhaka and Medhyakar properties, it might have shown the significant result on Memory Scale subtests. It is also reported that Silver nanoparticles reduce the brain inflammation and related neurotoxicity through induction of H 2 S synthesizing enzymes [13].

Shankhpushpi is said to be Medhya Rasayana by our classical texts. Its tridoshhara karma and Medhyakara Prabhava might have shown significant result on Memory scale.

Various clinical and experimental studies were done Shankhpushpi which have proved its antioxidative property, free radicle scavenging property, memory enhancer, antistress property.

It has been observed that dietry feeding of this plant has been found to increase protein synthesis of hippocampus, thus enhancing the learning ain experimental animals. Neurtransmitters are basically aminocids, by increasing the protein synthesis it may acts best on neurons for brain activity.

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