



Research Article

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A clinical evaluation of Rajata Bhasma and Shankhpushpi syrup as medhya

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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*, *Unmaadhar*, *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 *Shankhpushpi* 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 classical for *Medha*, *Smritikara*, *Matikaranam*, *Unmaadhar*, *Apasmarhara*, *Naadi Dorbalyakara* (Nervous system disorders) and *Rasayana*^[1] (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 *Shankhpushpi* 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.

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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:

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

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

Subtests	Memory Score		%Improvement	SD	'p' value
	BT	AT			
Remote Memory	4.7	5.50	17.02	0.422	<0.001
Recent memory	4.40	5.00	13.63	0.699	0.024
Mental balance	7.60	7.90	3.94	0.675	0.193
Attention & Concentration	10.50	11.60	10.47	1.524	0.048
Delayed recall	7.300	8.20	12.32	0.568	<0.001
Immediate recall	9.00	10.30	14.44	1.160	<0.001
Verbal Retention in Similar pair	5.00	5.00	00	00	1.00
Verbal Retention in dissimilar pair	5.40	8.80	62.96	2.319	<0.001
Visual retention	8.80	10.0	13.63	1.476	0.030
Recognition	9.60	10.0	4.16	0.699	0.104

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).
- In *Delayed and Immediate Recall subtests*, 12.32% and 14.44% improvement was found respectively which shows highly significant result (<0.001).
- In *Verbal Retention for Similar pair subtest*, no change was found, though patients scored full marks.
- In *Verbal Retention for dissimilar Pair subtest*, 62.96% improvement was found which is highly statistically significant (<0.001) result.
- In *visual Retention subtest* with 13.63% improvement, which is statistically significant (<0.05) in result.
- In *Recognition subtest*, percentage relief was only 4.16%, which is statistically non-significant.

Effect of trial medicine on Haematological Investigations

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

Variable	Mean		%age Change	p- value
	BT	AT		
Hb (gm%)	13.090	13.100	0.07	0.954
TLC(/cu mm)	6.21	6.17	0.64	0.814
DLC (%)Lymphocytes	29.56	29.49	0.23	0.962
Mixed	8.42	10.80	28.26	0.066
Neutrophils	62.02	59.71	3.72	0.334
ESR	7.60	9.40	23.68	0.485
SGOT	17.90	21.80	21.78	0.135
SGPT	21.30	25.50	19.71	0.472
FBS(mg/dl)	92.00	90.30	1.84	0.764
B. Urea (mg/dl)	22.60	22.60	0	1.00
S. Creatinine (mg/dl)	0.790	0.870	10.12	0.0868
Lipid Profile(mg/dl)				
T. Cholesterol	149.6	148.8	0.53	0.943
S. Triglycerides	124.0	129.4	4.11	0.790
HDL	42.90	40.10	6.52	0.286
VLDL	24.80	25.90	4.43	0.774
LDL	89.70	83.20	7.24	0.452

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

Overall Effect	No. of Cases	Percentage
Highly Improved (>15%)	00	00
Improved (>10%)	06	60%
Mild Improved (>5%)	04	40%
No Improvement	00	00
Deteriorated	00	00

DISCUSSION

Remote memory: In Remote memory subtest 17.02% improvement was found which is *statistically highly significant* (<0.001). It may be due to *sheet virya* property of *Rajata Bhasma*^[5] and *Shankhpushpi*^[6], which nourishes the *Kapha dosha*, for enhances the *dhriti karma*^[7] 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*⁶ *rasa* of *Shankhpushpi* for the proper functioning of *Udaan vayu*⁸ 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, *dhee* (perception) and *smriti* (recalling) type of *medhya* can be included. *Amla rasa* of *Rajata bhasma* and *katu rasa* of *Shankhpushpi* may nourishes the *prakritika karma* of *pitta dosha* i.e. *Dhee*^[10]. *Katu, Tikat, Kashya rasa* of *Shankhpushpi*^[6] and *Kashya 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 *dhee*^[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 *dhee karma* of *Pitta dosha*. *Madhura vipaka* of both drugs might have helped to normalise the vitiated *Pitta dosha* as *Medha* is *prakaritak karma*^[11]. (Ch.S.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 *prakritik karma* of *Pitta dosha*^[11] and *Udaan vayu*^[8].

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 (Dhee)*^[10] and *Dharana(dhriti)*^[7] may be *amla rasa* of *Rajata bhasma* and *katu, tikat rasa* of *Shankhpushpi* nourishes the *prakaritak karma* of *Pitta* i.e. *Dhee*. *Madhura rasa* of *Rajata bhasma*, *madhura vipaka* both drugs helps in maintaining the *dharana (dhriti)* prakartik karma of *Kapha dosha*.

Visual: In *Visual Retention Subtest*, 13.63% improvement was found which is *statistically significant* (<0.05) in result. The *dhee*^[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 *Alochaka 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 might have shown the *synergistic* effect with *Shankhpushpi syrup* as *Medhya*. As *Medhya* comprises of three mental faculties *dhee, 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. *manovaha satrotas*.

Rajata bhasma is also known to be *Smritikar, Medhyakar, Bharamhar, Apasmarhar, Unmadahar* by various *Ayurveda Acharya*. 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 *tridoshara 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 sacvenging property, memory enhancer, antistress property*.

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

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