



## Research Article

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### TRADITIONAL USE OF SWARNAMRITA PRASHANA AS A PREVENTIVE MEASURE: EVIDENCE BASED OBSERVATIONAL STUDY IN CHILDREN

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#### ABSTRACT

Swarna Prashana has been traditionally practiced across India as a recipe for child growth and memory enhancement and also to promote longevity. Swarnamrita Prashana is a modified preparation of Swarna Prashana, containing Swarnabhasma along with Medhya (nootropic) drugs in the media of ghee. It is administered once a month on the day of Pushyanakshatra. This has been started as public health initiative by SDM College of Ayurveda and Hospital, Hassan in 16 centers spread across Karnataka. Acceptance of this public health initiative assessed on the basis of public response.

**Keywords:** Swarnamrita Prashana, public health initiative, Swarna Bhasma, Medhya Rasayana, nootropic drugs, Pushyanakshatra, immunity.

#### INTRODUCTION

Ayurveda, a translational science with rich heritage and antiquity; its essence is percolated from knowledge based Veda. Later on, this got systemized to professionalism for the prevention, promotion and care of disease condition. In addition to promote, maintain positive health employment of Rasayana treatment in the contemporary literature is also advised.<sup>1,2</sup> There are immense information on the drug formulation pertaining to Rasayana activity aimed to nourish Rasa (nutrient) and Rasayani (transportation channels) for optimum preventive and promotive effect.<sup>3</sup> In Kashyapa Samhita, Swarna Prashana has been mentioned as it is an important recipe for child growth and memory enhancement and also to promote longevity in children on one month use.<sup>4</sup> On evaluation, it came to notice that people living in coastal area of Maharashtra, Karnataka and Goa were administering drugs to children with ritual flavor for health promotion on advice by the traditional Vaidyas. These drugs were identified as Swarna in different form with Ghrita and Madhu.

Swarnaprashana was modified on the literary back up from classical compendiums to Swarnamrita Prashana. Besides Swarna Bhasma, Medhya drugs like Amrita (Guduchi) were added which was added to enhance the nootropic property. It contains plant extractives mixed with Ghee and honey and was given to lick (Prashana). As a public health initiative, it is being administrated at different centers every month on an auspicious day i.e. on Pushyanakshatra for children. To validate this initiative, pilot clinical study was also conducted.

#### MATERIALS AND METHODS

##### Preparation and Posology of Swarnamrita Prashana

Swarnamrita Prashana, herbo-mineral formulation was prepared in Pharmacy of Shri Dharmasthala Manjunatheshwara (SDM) College of Ayurveda and Hospital, Hassan, Karnataka.

Guduchi (*Tinospora cordifolia*) green stem Kashaya (water extract) was prepared reducing to quarter. In 200 ml of Guduchi Kashaya, 50 ml of Ghee was added along with Brahmi (*Bacopa monnieri*), Vacha (*Acorus calamus*), Jatamamsi (*Nordostyichys jatamamsi*), Ashvagandha (*Withania somnifera*), Shankhapuspi (*Convolvulus pluricaulis*), Yasthimadhu (*Glycerrhiza glabra*), Pippali (*Piper longum*) and Maricha (*Piper nigrum*) 2 g powder of each and 50 ml of Murchita Ghrita (processed Ghee) and heated on low temperature according to Ghrita Paka. At the time of administration 1.2 gram of Swarna Bhasma and 50 ml of honey were added to this Ghrita and triturated. To maintain the consistency, the bowl of Swarnamrita Prashana kept in hot water. This preparation was used in a dose of 4 drops to children using dropper. Each dose consisted of 2 mg of Swarna Bhasma (24 drops=1 ml).

##### Multi-Centric Public Health Initiative

Children aged between 0-16 years were administered Swarnamrita Prashana once in a month on Pushyanakshatra day at 16 centers.

On the days of Pushya Nakshatra, children accompanied by their parents reported to the registration counter. A card was handed over with registration number containing details about name, date of birth, age and address along with parent's name. Afterwards they reported to the

examination hall at different counters to determine the anthropometric measurements and following details were entered into the card. Weight (kg up to gram), height (in cm), head circumference (cm) and chest circumference (cm) were recorded. Any illness and its duration were also documented. On completion, they reported to the card collection counter and carried a slip to Swarnamrita Prashana drop counter. All the parents were advised not to give any food to child for 1 hour after drug administration. The same procedure was followed in all the 16 identified centers of Swarnamrita Prashana.

**Clinical Research Group**

Children reporting with cough and common cold of the age group 3-8 years were included from the outpatient department of SDM college of Ayurveda and Hospital, Hassan in the study. They were subjected to physical examination. X-ray chest was done, wherever necessary, for exclusion of any underlying pathologies. Symptoms of upper respiratory tract infection were scored arbitrarily and noted before and after treatment. Measured dose of 1 ml per day pack was given to parents and advised to administer early in morning empty stomach, once daily for 30 days. Date of birth, age, height (cm), weight (kg up to gram), and different measurements like head circumference, chest diameter and detailed history of all the children included in the study were recorded.

**PROGRESS AND MONITORING**

**Multicentric Public Health Initiative**

The study on Swarnamrita Prashana was started on 29<sup>th</sup> May, 2009 on Pushyanakshatra at the SDM College of Ayurveda and Hospital, Hassan with 334 children. In the second (1749) and third month (3259) only Hassan centre was involved. After third month, SDM outlet Hospital at Chikmagalore was included. From 11<sup>th</sup> month onwards, SDM Women’s College at Mysore was included as another centre. From 15<sup>th</sup> month onwards, HAL Jain temple, Bangalore started functioning. Mahaveera Bhawan at Chamrajanagar was included from 19<sup>th</sup> month

and Rotary Bhawan at Bellur from 21<sup>st</sup> month. Four more centers at Kollegal, Javagal, Chintamani, and Sakaleshpura were added from 23<sup>rd</sup> month. Based on public response, new centres viz. from 30<sup>th</sup> month at Davanagere; from 32<sup>nd</sup> month at Arisikere and Birur; from 33<sup>rd</sup> month at Belagur; from 35<sup>th</sup> month Rajarajeshwari Nagar, Bangalore was added. Overall 3,48,177 children have participated in this public health initiative. (Table 1) Hassan Centre alone has administered 1,63,927 doses till date. (Table 2) Mean attendance in every cycle of Swarnamrita Prashana in different centers shown in Table 3.

After the completion of 21 (monthly) doses opinion of parents were recorded for drug response with proforma containing nine questions. The responses were recorded as feedback (in local Kannada language). (Table 4)

Public response study was assessed through questionnaire. Into, 400 questionnaires were distributed for the first instance and 312 responded. Analysis of the same revealed following facts: 94.73% reported improvement in mental and physical health. 56.14% parents reported that the child is free from recurrent respiratory tract infection in past 6 months. 92.10% parents explained their neighbors about Swarnamrita Prashana and its benefits. The results are summarized in Table 5.

**Clinical Study**

30 children between 3-8 years participated in clinical study. 22 children were in the age group between 3-5 years; 18 were male and rest were female. 21 children were from lower income group. They were administered 1 ml Swarnamrita Prashana once daily for thirty days before food on empty stomach. Symptoms of upper respiratory tract infections like cough, sleep disturbance, ronchi, tonsillitis, dyspnea and pharyngitis were scored arbitrarily and noted before and after treatment. The results are summarized in Table 6.

**Table 1: Centers Participating In Swarnamrita Prashana Camps Once in a month**

Sl.	Camps (Month )	Centers	Number of centers on operation	Number Dose/Day
1	1 -3	Hassan	1	5,342
2	4 - 10	Chikmagalore	1 + 1 = 2	46,518
3	11 - 14	Mysore	2 + 1 + 3	31,346
4	15 - 18	Bangalore	3 + 1 + 4	37,725
5	19 - 20	Chamarajanagar	4 + 1 = 5	22,098
6	21 - 22	Bellur	5 + 1 = 6	45,631
7	23 - 29	Kollegal, Javagal, Chintamani, Sakleshpura, Malur	6 + 5 = 11	84,412
8	30 -31	Davanagere	11 + 1 = 12	23,468
9	32	Arsikere, Birur	12 + 2 = 14	12,050
10	33 - 34	Belagur	14 + 1 = 15	22,955
11	35 - 38	Rajarajeshwari Nagar	15 + 1 = 16	43,484
Total	38 dose cycle	Hassan, Chikmagalore, Mysore, Bangalore, Chamrajanagar , Bellur, Kollegal, Javagal, Chintamani, Sakleshpura, Malur, Davanagere, Arisikere, Birur, Belagur, Rajarajeshwari Nagar, Bangalore.	16	3,48,177

**Table 2: Details of Registered Children and those completed 21 Dose (Hassan Center)**

1	Total centers (as on 05.03.2012)	16
2	Total registration (Hassan) 05.03.2012	26,798
3	Total dose administered in Hassan	1,63,927
4	Children who have completed 21 dose in Hassan centre	1,900

**Table 3: Mean Attendance in cycle at Different Centers**

Name of the Centers	Total Cycle (month)	Total Participant	Mean attendance/cycle
Hassan	38	163927	4313
Chikmagalore	34	48944	1439
Mysore	27	47696	1766
Bengaluru	23	48580	2112
Chamarajanagar	19	9168	482
Belluru	17	5684	334
Kollegala	15	7559	503
Javagal	15	4681	312
Chintamani	15	3588	239
Sakleshpura	15	3616	241
Malur	1	93	93
Davangere	5	527	106
Arsikere	6	1305	218
Birur	6	1178	196
Belaguru	5	864	173
Rajarajeshwari Nagar, Bangalore	3	767	256
Total	16	348177	

**Table 4: Questions for assessment of Response**

Sl.	Questions
1.	How long your child was under Swarnamrita Prashana therapy?
2.	Have you noticed any physical and mental change?
3.	Whether your child was suffering from any respiratory infection like, cough, running nose and recurrent fever?
4.	Whether your child suffering from digestive tract complaints like loose motion vomiting?
5.	Response to infection reduction?
6.	Change in behavior?
7.	Any change you have noticed in attention to studies and concentration?
8.	Does your child had asthma or convulsions, if yes what is the response about Swarnamrita Prashana therapy?
9.	Have you suggested your neighbor for Swarnamrita Prashana therapy?

**Table 5: Public Response on the efficacy of Swarnamrita Prashana once in a month**

Sl.	Public Response	Reduction in percent
	Total responded	312
1	Improvement of mental and physical health	94.73
2	Recurrent respiratory tract infections	56.14
3	Improvement in intelligence, memory and concentration	79.46
4	Improvement in digestion related complaints	79.82
5	Volunteered to create awareness	92.10

**Table 6: Improvement in Symptoms on the use of Swarnamrita Prashana once daily for 30 days**

Sl.	Symptoms	Symptoms Score		Reduction in symptoms (%)	P value
		Before	After		
1	Cough	2.43	1.37	43.83	<0.001
2	Sleep disturbance	0.87	0.27	69.22	<0.001
3	Ronchi	1.17	0.63	37	<0.001
4	Tonsillitis	0.53	0.27	50	>0.001
5	Dyspnoea	0.77	0.27	65.21	<0.001
6	Pharyngitis	0.10	0.03	66.70	<0.05

**DISCUSSION**

Both multicentric public health initiative and clinical study pilot were conducted to note the preventive and promotive aspect of Swarnamrita Prashana in children. Acharya Kashyapa provided ideas regarding its importance, indication and contraindication etc. Swarnamrita Prashana a herbo-mineral preparation with extractives of herbs in Ghrita media; having Balya, Rasayana, Medhya, Tridoshahara properties. Gold is one of the noble metals being used in continuity to increase the vitality and immunity.<sup>5</sup> Swarna Bhasma promotes immunity through phagocytosis and found to be effective in motor neuron diseases in small dose.<sup>6</sup> Several studies on gold nano-particles (GNP) reported that it conjugates with antigen to influence activation of T-cells; reducing RES uptake producing a hydrated barrier causing steric hindrance to the attachment of phagocytes.<sup>7</sup> In medicine, most interesting part is the use of nanoparticles to enhance drug delivery system.<sup>8</sup> GNP exhibits unique physico-chemical properties including

surface plasmin resonance and ability to bind amine and thiol group allowing surface modification and use in bio-medical application.<sup>9</sup> Gold nanoparticle as drug carrier an important demonstration of potential of multifunctional for drug delivery.<sup>10</sup> GNPs (5 nm) as delivery vehicle covalently bound to centuximab, as an active targeting agent and gemcitabine as a therapeutic payload in cancer.<sup>11</sup> The protein adsorption was studied by ellipsometry-antibody techniques in situ, and adhering platelets were visualized with fluorescein isothiocyanate-labelled anti-CD 61 antibodies. Adhering platelets were quantified by counting labeled cells in microscopic image fields. The spreading of platelets was studied by scanning electron microscopy. The results show that after 1 minute of plasma exposure, fibrinogen, IgG and albumin were detectable with antibodies on both surfaces. The amount of deposited fibrinogen and complement decreased with time on titanium, and the amount of adsorbed anti-high molecular weight kininogen increased. No complement

was detected on gold surfaces after plasma incubation, and the antibody binding pattern also remained unchanged after prolonged plasma exposure. The surface-bound platelets were found to spread on the gold but not on titanium.<sup>12</sup>

Swarna Bhasma is considered as best among the metals used and considered as Sada Louha.<sup>13</sup> In Ayurveda, gold is used either as Swarnabhasma or Swarnaparpati or Swarnapatra or in colloid red solution. Swarnabhasma is prepared by incinerating gold processed with herbal preparations. Gold is used in calcined form (Bhasma) in interior science.<sup>13</sup> Human, animals and plants cannot survive without 21 elements.<sup>5</sup> The clinical applications of Swarnabhasma and gold salts are integrated both in Ayurveda and medical science for rejuvenation and immunomodulation for some chronic diseases. In Ayurveda, herbo-mineral compounds are used for healing properties with an objective to health promotion.<sup>14</sup>

Traditional gold preparations are attributed with rejuvenating and antioxidant properties. Earlier studies revealed analgesic, immunostimulant, adaptogenic and glycogen sparing properties. Significant restoration of altered values to near normal levels suggest potentials for gold preparations in stress and depression.<sup>15</sup> Traditional preparations of gold exhibited immunostimulant activity on macrophage functions in contrast to immunosuppressive effects of a gold containing drug auranofin. This is an interesting observation and gives a rational basis to the claim of efficacy and safety of gold when used in calcined forms.<sup>16</sup> Gold in calcined (Bhasma) form is used in various ailments like tuberculosis, anemia, cough, debility, infertility and muscular dystrophy.<sup>17</sup> It is considered best rejuvenator, promotes longevity and prevents aging.<sup>18</sup>

Many studies support immunomodulatory, antiaging, nootropic and antistress effect of Ashwagandha.<sup>19,20,21</sup> It is found to be efficacious in the treatment of pulmonary tuberculosis as adjunct therapy with anti-tubercular drugs (ATD). The quality of life of the patients was improved on the arbitrary well-being scale along with estimations of immunoglobulins (IgA, IgM).<sup>2</sup> In humans four Rasayana drugs Mandukaparni (*Centella asiatica*), Tulasi (*Ocimum sanctum*), Vacha (*Acorus calamus*) and Tagara (*Valeriana wallichii*) are found to be effective in enhancement of memory, stress, lack of attention, neurotism and depression.<sup>22,23</sup> Inclusion of Vacha in Swarnamrita is also substantiated by the facts that it shows the immunomodulatory activity. Yastimadhu (*Glycyrrhiza glabra*) shows vast range of biological activities including immunomodulatory, anti-inflammatory, antiallergic and antiviral activity. It also enhances permeability in drug delivery system.<sup>24</sup>

Brahmi is popular among common people that it enhances memory. Brahmi Ghrita or Brahmi plant fried with ghee are usual practice in Indian community. Behavioural learning improvement in rats including significant improvement in mental control, logical memory and paired associated learning during 12 weeks of treatment.<sup>25</sup>

Guduchi (*Tinospora cordifolia*) is widely used for the treatment of diabetes mellitus, arthritis and inflammation. Experimental studies reveal that it is immunostimulant and combats sepsis in animals.<sup>26-32</sup> Pippali and Maricha are important drugs for the treatment of cough, common

cold and useful as digestive. The active principle piperine has shown to increase bioavailability especially to anti-tubercular drugs.<sup>33</sup> Recently the research outcome with piperine got approval of Drug Controller of India for the reason that it halved rifampicin dose when administered along with piperine with the plea that bioavailability of ATD will be optimum. Honey has got potential role to play as drug delivery system with immunomodulatory effect.<sup>34</sup>

In a study conducted among school going children of Kolkata of low income group showed that underweight and overweight were found to be the risk factors for diseases.<sup>35</sup> This public health initiative is an example of health economics involvement with improvement. Further research on Swarnamrita Prashana can shed light on preventive aspect of health on the completion of 21 cycles. It is likely that many questions need to be addressed in near future. The pilot clinical study provided information that continued one month use of Swarnamrita Prashana reduced different respiratory symptoms. Rigorous quality assurance needs to be ensured for minimizing batch to batch variation when production scales up for clinical use extensively.

This study suggests that controlled clinical trial needs to be taken up with biomarkers to support the immunomodulatory activity of Swarnamrita Prashana. Comprehensive controlled clinical trials with immunological profile determination can only open way for wide use in National Health Programme for the benefit of the children.

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