



“Clinical Trial to Study the effect of *Vriddadaru Kalpa* on Aging in Apparently Healthy Elderly Subjects.”

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ABSTRACT

With the growing number of elderly individuals in today's society the health problems of old age are becoming more and more overt. Accordingly, Geriatrics is emerging as a major medical specialty world over. In India too the last decade has projected significantly rising rate of population- aging and hence a great need is now felt to strengthen the geriatric care system in this fast developing most populous country. According to an estimation, India currently has 6.7% over 65 years of age, which is expected to increase to 20% by the year 2050. As growing old is a part of the life cycle, the effect of time is bound to happen and is unavoidable. The *kalaja jara* is a *swabhavika vyadhi*, wherein, it is clearly mentioned that *swabhava bala pravritta vyadhis* being *yapya*, can be managed through *bhojana*, *paana*, and *rasayana*. *Vriddadaru Rasayana* is one such *rasayana* mentioned in *Gadanigraha* especially for the elderly to promote healthy ageing and helping to prevent old age problems. **Aims and objectives:** To assess the effect of *Vriddadaru Kalpa* in improving the general body health and quality of life in the apparently healthy elderly subjects. **Methodology** – A Randomized control study where 50 healthy elderly subjects were administered with *Vriddadaru kalpa* for a period of 12 weeks and it was compared with group of 50 healthy elderly subjects were administered with *Bhargavaproktha Rasayana* for a period of 12 weeks. **Observations and Results-** *Vriddadaru Kalpa* showed significant increase in DHEAS levels, significant decrease in lipid profile, inflammatory markers and CRP and 6MWT. **Conclusion:** *Vriddadaru* does *vatashamana*, balancing the *doshas*, increasing the *utsaha* and *parakrama* and helps in improving the *agni* thus helping in *dhatuposhana* in the elderly.

Keywords: *Rasayana*, *Vriddadaru*, *Jara*, *ageing*

INTRODUCTION:

Ageing is a physiological process that starts from birth, continues throughout life and ends with death. This process of ageing is assessed by comparing biological age with chronological age. If biological age corresponds to chronological age, the ageing process is normal. If biological age lags behind chronological age, the ageing is delayed. If biological age has advanced ahead of chronological age, the ageing is described as precocious or premature.

According to an estimation, India currently has 757 million persons over 65 years of age – coming to around 6.7% of the population – a gigantic leap from 3.4% in 1988, which is expected to increase to 20% by the year 2050. Elderly people often have limited regenerative abilities and are more susceptible to diseases. Increasing life span and poor health care add to the degree of disability among the elderly. Therefore, the care of elderly is mandatory.

In *Ayurveda* ageing is defined as '*Jara*'. *Jara* word derived from the root word "*jrushvayohanau*" explained as "*vayahkrita slathamamsadi avastha*" meaning loosening of muscle and other tissues under the

influence of ageing ^[1]. According the *sushruta samhita*, *Vaya* (age) has been divided into three parts viz. *balyavastha* (young age 0-16 yrs), *madhyamavastha* (middle age 16-70 yrs) and *jirnavastha* (old age >70 yrs). After 70 years there will be progressive diminution of *dhatu*, strength of sense organs, vigor, masculinity, bravery, power of understanding, retaining and memorizing, speech and analyzing facts ^[2]. Thus, the *vridhnavastha* or *jirnavastha* is the last phase of life and is represented by the decay or degeneration of the body. *Sushrutacharya* has mentioned '*Jara*' (ageing) under '*swabhavabala pravritta vyadhi*' which is of two types viz. *kalaja* (*Parirakshanakrita*), appearing at the proper time even after proper protection and *akalaja* (*Aparirakshanakrita*), appearing before the proper time due to improper care and prevention ^[3]. *Jara* is an inescapable part of life, *Jara* occurring timely is unavoidable and irreversible. Whereas it can be delayed by maintaining the health of the elderly which can be achieved by *rasayana* ^[4] which has been justified by *chakrapani* with an example of *chyavanamuni* who regained his youthfulness by the consumption of *chyavanaprasha rasayana* (*Bhargavaprokta rasayana*) ^[5].

Rasayana therapy is one such unique dedicated stream of *Ayurveda*, which includes immune protective and promotive, anti-degenerative and rejuvenated health care. It is known for its preventive action on ageing and improving the quality of life of healthy as well as diseased ^[6]. In order to obtain best results of *rasayana* therapy it has been told to administer to a person who has self-control and has undergone proper *shodhana* therapy. It has been clarified that, as the *baala* and *vridha* cannot tolerate the *samshodhana* therapy, it is not advised to give *shodhana* to them. The person who are fit for *shodhana* are also eligible for *rasayana* therapy ^[7]. Administration of *rasayana* is highlighted during *madhya vayas*. *Rasayana* administration during *madhya vayas* is justifiable to control the damage and postponing the occurrence of *jara avastha* ^[8]. *Vriddadaru Rasayana* is one such *rasayana* preparation mentioned in *Gadanigraha* for elderly individuals ^[9].

Thus a clinical research study was planned to assess the *Rasayana* effect of the *Vriddadaru Rasayana* in healthy elderly subjects and to compare the effects of *Vriddadaru Rasayana* with *Bhargavaprokta Rasayana* as control group.

OBJECTIVES OF THE STUDY:

1. Change in Quality of life using WHO-QOL-BREF.
2. Change (improvement) in functional exercise capacity by **6 min. walk test** (from baseline with the end of 12th week).
3. Improvement in metabolic profile or change in the laboratory parameters.
4. HbA1c (baseline & end of 12th week).
5. CBC (Complete Blood Count) (from baseline & 12th week).
6. CRP (high sensitivity C-reactive protein) (from baseline & 12th week).
7. Lipid profile (from baseline & 12th week).
8. Inflammatory markers- TNF-Alpha and INF –Gamma (from baseline & 12th week).
9. Catalase Assay (from baseline & 12th week).
10. DHEAS hormonal assay (from baseline & 12th week).

MATERIALS AND METHODS

The drug compound *Vriddadaru* was procured from SDM pharmacy, Udupi. In this preparation the *Vriddadru moola* has been dried under sunlight and powdered and mixed with *grita* (ghee) and kept in a *gritalipta paatra* in *dhanya rashi* for 1 *paksha* (15 days). After 15 days the obtained final product (*avaleha*) can be consumed with milk as *anupana*. The *avaleha* was administered to patients of study group.

SUBJECTS AND METHODS:

A total of 112 elderly volunteers were screened for the present study and amongst which 100 apparently healthy elderly individuals who were fulfilling the inclusion criteria were selected irrespective of their sex, caste, religion and socio-economic status after obtaining the informed written consent. Subjects were randomized to either group- study and control group, 50 in each group by Simple Random Sampling Method. The subjects underwent routine examination including vital parameters and complete details were collected. The individuals were assessed before and after the intervention.

CRITERIA FOR SELECTION OF VOLUNTEERS:

Inclusion criteria

1. Apparently Healthy Male/Female volunteers of age between 60 and 75 years.
2. Willing to participate for 12 weeks and come for follow up after 4 weeks.

Exclusion criteria

1. Patient with systemic illness like uncontrolled hypertension, uncontrolled diabetes, ischemic heart disease, chronic obstructive pulmonary disease and other chronic diseases etc.
2. Patients who have completed participation in any other clinical trial during the past six months.

STUDY DESIGN:

- Study Type: Interventional
- Allocation: Randomized
- Purpose: Prevention
- Blinding: Single Blind
- Timing: Prospective
- Control: *Bhargavaprokta Rasayana* (active control)
- No. of Groups: Two

DOSE FIXATION

Based on a previous study conducted on the control drug *Bhargavaprokta Rasayana* on clinical efficacy and safety in apparently healthy elderly subjects, where in the dose given was 12 gm orally twice daily for 12 weeks with milk as anupana ^[10].

INTERVENTION:

Group-A – *Vriddadaru kalpa* (Intervention Group): 12 gm administered orally twice daily on empty stomach in the form of *Avaleha* with milk

Group-B – *Bhargavaprokta Rasayana* (Control Group): 12 gm administered orally twice daily on empty stomach in the form of *Avaleha* with milk

Duration of the study: 12 weeks after Randomization and drug administration. Subjects were reviewed on 0th, 30th, 60th and 84th day.

Follow up: 4 weeks after the completion of the study.

METHODS OF ASSESSMENT

The assessment of the study was done based on the subjective and objective parameters.

Subjective parameters –

- A. **WHO-QOL-OLD** ^[11] Questionnaire assessment – they were assessed as FACETs once before administration of study and once after administration of study drug.
- B. **6-minute walk test** ^[12] - once before and once after administration of drug.

Objective parameters:

1. CBC (Complete Blood Count) with ESR.
2. Hs - CRP (High sensitivity C-reactive protein).
3. Inflammatory markers – TNF-Alpha, INF-Gamma.
4. DHEAS hormonal assay.

OBSERVATIONS:

In the present study overall majority (57.5%) were females. In group A majority 14 (70%) were females, but in group B majority were males 11 (55%). Majority of the individuals (65%) included belonged

to the age group 60-65years, with 12 (60%) in group A and 14 (70%) in group B. All subjects were married and majority belonged to Hindu religion (97.5%).

In the present study maximum number of individuals belonged to middle class (50%) and around 52.5% of subjects having completed their primary education. As majority were females, most of them were home makers (55 %), with another 25 % presently working and 20% retired employees. All the subjects were apparently healthy with good appetite with regular bowel and bladder habits and more than 60% of them having a sound sleep at night.

Demographic variables like height, weight, BMI and healthy vital parameters like Blood Pressure (BP)- both systolic (SBP) and diastolic (DBP), Heart Rate (HR), Respiratory Rate (RR) were captured before administration of study drug and were comparable among both groups as shown below in table no.1.

Table No-1: Mean, Maximum (M) and minimum (m) value of all for the variables – Height, Weight, BMI, BP, Pulse Rate, and Respiratory Rate.

VARIABLES	GROUP A				GROUP B			
	MEAN	m	M	SD	MEAN	m	M	SD
HEIGHT (cm)	155	142	169	6.14	163.72	144	180	10.20
WEIGHT (Kg)	58.91	37	82.8	12.48	62.32	51	75	7.41
BMI (Kg/m ²)	24.3	18.10	32.3	4.10	23.37	16.6	27.5	2.98
SBP (mm Hg)	137	120	160	12.60	137	110	160	14.17
DBP (mm Hg)	84	70	90	5.98	86	80	100	5.98
PULSE RATE (per min)	81.2	68	90	4.17	76.2	50	94	9.01
RESP. RATE (per min)	19.3	18	22	1.62	19.15	18	22	1.49

RESULTS:

Both groups showed improvements in subjective and objective parameters. When compared, Group A (*Vriddadaru Kalpa*) shows better improvements than Group B (*Bhargavaprokta Rasayana*) in some of the parameters like;

- WHOQOL-OLD module– WHO Facet 2 and Facet 5 (table no.1 and table no.2).
- Objective parameters –like High sensitivity C-Reactive Protein (Hs-CRP), TNF Alpha, INF Gamma and 6-minute walk test (table no. 3,4,5 and 6).

Table No-1: Effect of *Vriddadaru Rasayana* on WHOQOL-OLD FACET scores

	Data	Paired t test						% of change
		Mean	±SD	±SEM	Diff	t	P	
FACET I	BT	15.65	1.89	0.42	0	-	-	0
	AT	15.65						
	BT	15.65	1.89	0.42	0	-	-	
	FU	15.65						
FACET II	BT	13.35	1.72	0.38	0	-	-	0
	AT	13.35						
	BT	13.35	1.72	0.38	0	-	-	
	FU	13.35						
FACET III	BT	13.15	1.69	0.37	0	-	-	0
	AT	13.15						
	BT	13.15	1.69	0.37	0	-	-	
	FU	13.15						

FACET IV	BT	11.80	2.94	0.65	0	-	-	0
	AT	11.80						
	BT	11.80	2.94	0.65	0	-	-	0
	FU	11.80						
FACET V	BT	15.55	2.70	0.60	0	-	-	0
	AT	15.55						
	BT	15.55	2.70	0.60	0	-	-	0
	FU	15.55						
FACET VI	BT	14.45	1.87	0.41	0	-	-	0
	AT	14.45						
	BT	14.45	1.87	0.41	0	-	-	0
	FU	14.45						

Table No-2: Comparison of effects of Vriddadaru Rasayana and Bhargavaprokta Rasayana on WHOQOL-OLD FACET scores

	Group	Data	Unpaired t test			Between Gp	
			±SD	±SEM	Diff	t	P
FACET I	A	BT-AT	0	0	0	-	-
	B		0	0	0		
	A	BT-FU	0	0	0	0.80	0.42
	B		0.55	0.12	0.1		
FACET II	A	BT-AT	0	0	0	1	0.33
	B		0.44	0.1	-0.1		
	A	BT-FU	0	0	0	1	0.33
	B		0.44	0.1	-0.1		
FACET III	A	BT-AT	0	0	0	-	-
	B		0	0	0		
	A	BT-FU	0	0	0	-	-
	B		0	0	0		
FACET IV	A	BT-AT	0	0	0	1	0.33
	B		0.89	0.2	0.2		
	A	BT-FU	0	0	0	1	0.33
	B		0.89	0.2	0.2		
FACET V	A	BT-AT	2.70	0.60	0	1.45	0.16
	B		2.70	0.60	0		
	A	BT-FU	2.32	0.51	-0.3	1.45	0.16
	B		2.32	0.51	-0.3		
FACET VI	A	BT-AT	1.87	0.41	0	-	-
	B		1.87	0.41	0		
	A	BT-FU	2.59	0.58	0	-	-
	B		2.59	0.58	0		

Table No.3: Effects of *Vriddadaru Rasayana* and *Bhargavaprokta Rasayana* on objective parameters

	Group	Data	Unpaired t test				Within Group		Comparison b/n Groups	
			Mean	±SD	±SEM	Diff	t	P	t	P
Hb (gm%)	A	BT	13.25	1.30	0.29	-0.38	1.59	0.12	-1.73	0.091
		AT	12.87	1.45	0.32					
	B	BT	13.24	1.36	0.30	0.14	-0.76	0.45		
		AT	13.38	1.32	0.29					
ESR (mm/hr)	A	BT	30	16.6	3.71	1.3	-0.27	0.78	0.708	0.486
		AT	31.3	18.9	4.24					
	B	BT	28.5	9.94	2.22	-2.3	1.36	0.18		
		AT	26.2	10.3	2.31					
TNF α (pg/ml)	A	BT	19.26	13.3	2.98	-1.54	1.69	0.10	0.376	0.709
		AT	17.72	11.7	2.62					
	B	BT	45.46	81.6	18.2	-2.12	1.72	0.10		
		AT	43.34	79.8	17.8					
INF γ (ng/ml)	A	BT	6.34	3.19	0.71	2.24	-0.94	0.35	0.60	0.551
		AT	8.58	11.0	2.46					
	B	BT	6.00	4.78	1.07	0.75	-1.13	0.27		
		AT	6.75	7.54	1.68					
DHEAS (mcg/dl)	A	BT	1.02	1.08	0.24	-0.22	2.44	0.02	-1.44	0.158
		AT	0.80	0.73	0.16					
	B	BT	1.11	0.72	0.16	-0.03	0.28	0.77		
		AT	1.08	0.73	0.16					

Table No.4: Effects of *Vriddadaru Rasayana* on Hs-CRP

Wilcoxon Signed Rank Test			
Hs-CRP	Z value	P value	Inference
BT-AT	-1.00	0.317	NS

Table No.5: Comparison of effects of *Vriddadaru Rasayana* and *Bhargavaprokta Rasayana* on Hs-CRP

Mann Whitney U test					
Objective parameter	Data	Mean Rank		Z value	P value
		Group A	Group B		
Hs-CRP	BT-AT	19.13	21.88	-1.125	0.261

Table No.6: Comparison of effects of *Vriddadaru Rasayana* and *Bhargavaprokta Rasayana* on 6MWT

	Group	Data	Unpaired t test				Within Group		Between Group	
			Mean	±SD	±SEM	diff	t	P	t	P
6MWT	A	BT	333.0	41.1	9.20	34.5	-5.5	0	1.48	0.145
		AT	367.5							
	B	BT	336	45.2	10.1	21	-3.1	0.005		
		AT	357							

DISCUSSION

Rasayana chikitsa or rejuvenation therapy is one among the eight specialities of *ayurveda* helps to promote and preserve health and longevity in the healthy and to cure diseases in sick population. *Rasayana* may not be always a drug therapy alone, but also include various other aspects like food as *nityasevaniya*

dravya, good conducts as *sadvritta* and behaviour as *achara rasayana* and thereby they preserve positive health by influencing the fundamental aspects of a body through *dosha*, *dhatu*, *agni* and *srotas*.

Drug Review and its probable mode of action

In *Gadanigraha*, *samanya rasayanadhikara* and *astanga sangraha rasayanadhikara*, we get a detailed description of the drug *Vriddadaru*. Due to its *katu*, *tikta*, *kashaya rasa* and *ushna veerya* it does *kapha-vata shamana*. And it is told that the person who consumes *Vriddadaru Rasayana* will become vigorous and active like a young adult. Further it is explained that *bhagnasti* person will attain *shlistasthi*, *gadgada vaak* will have *madhura vaak*, person having *pangu* will walk properly, *krusha* will become *sthula* and *hrisva* will become *dheergha*.

According to *sushrutha samhita* there are two varieties of *Vriddadaru*, which are mentioned in *gulmavishapaha gana* along with the other drugs like *trivrit*, *danti*, *kampillaka*, *kramuka*, etc. Here there is mentioning of the word *chagalantri* which is a synonym of *Vriddadaru*, whereas *dalhana* comments it as *Vriddadaru bedha*. But, there is no detail description of the 2 varieties of *Vriddadaru*.

The ingredient of *Vriddadaru Rasayana* is *Vriddadaru moola* which is said to have *kapha-vata shamaka* property. In *vriddhavastha* as we have seen there will be predominancy of *vata dosha*, so this yoga may help in controlling *vata dosha* and can bring it to normalcy. *Katu*, *tikta* and *kashaya rasa* has the property of enhancement of *agni* and does the dilatation of *srotus*. Due to this there will be improvement in digestion as well as absorption of *ahara rasa*. Proper absorption of *ahara rasa* in *grahani* will promote the nourishment of all *dhatu*. Since it has got *ushna virya* and *madhura vipaka*, which leads to further enhancement of *agni*, because of which the *rasa* will form the *uttarottara dhatu* properly and does *dhatu poshana*. The *laghu-snigdha guna* of *Vriddadaru* further does *dhatu poshana* and helps to relieve the problem established because of depleted *dhatu*. *Katu*, *tikta* and *kashaya rasa* of *Vriddadaru* in combination shows the quality of *sandhanakara* as well as *sthirikarana of dhatu*.

Due to *laghu-snigdha guna*, *vatahara* property there was reduction in *twakparushata*. Due to *tikta* and *kashaya rasa* which shows the effect in the form of *sthirikarana* (stabilising) and *sandhanakarana* of the *shareera*, *dhatu* and *asti*, the symptom of *slata asthi* which is due to depletion of *asthi dhatu* was rectified. The improvement in *slata sandhi* can be justified because of the *laghu-snigdha guna*, *ushna veerya*, *deepana* action and *vata-kaphahara* properties.

The improvement in *smarana shakti* is may be because of *katu rasa* and *madhura vipaka*. *Katu rasa* nourishes all the *indriya* and does the *vivarana of srotas* and maintain their patency and also it helps to attain the normalcy of *manas* leading to the improvement in *smarana shakti*. In elderly the *smaran hani* can also be due to *vata prakopa* which can be rectified by the *madhura vipaka* as well as *brihmana* property of *Vriddadaru*.

The *katu-tikta-kashaya rasa*, *laghu-snigdha guna*, *ushna veerya*, *deepana*, *balya* and *vata-kaphahara* properties of *Vriddadaru* will lead to improved *utsaha* in the elderly. And, the quality of *parakrama* is influenced by *dhatu* as well as *manas*. *Vriddadaru* by its *rasayana* effect improves the quality of *rasadi dhatu* and shows the positive effect over *manas* by its *katu rasa*. Due to which there was improved strength in the subjects. Also, *Vriddadaru* has *snigdha guna*, *balya* action and *vata-kaphahara* property which helps to improves the *parakrama*.

Argyrea speciosa (botanical name of *Vriddadaru*) was reported to stimulate both cellular and humoral immunity^[13] and the alcoholic extract of the roots showed significant anti-inflammatory and analgesic activity^[14]. Few of the studies also showed a significant result in learning, memory and cognition in mice^[15] so, as in old age there will be diminution of the immunity, inflammatory changes and diminution in cognitive function, memory, grasping, speech, wisdom, etc. Thus this drug may help in improvement of these functions in elderly.

Since the study was conducted in apparently healthy individuals, the health status was maintained even after the administration of the study drug. Thus there was no significant improvement seen in all the parameters and hence, it can be interpreted that the health status was not deteriorated.

With regard to the objective parameters, Hemoglobin can be low in elderly due to various reasons like low production, iron deficiency, Vit B12 deficiency thus the discrepancy in scores between Group A and Group B. These results could have been by chance rather than a finding of the study. Like Hb, there could be age and sex related variations in ESR and majority of our study subjects were female. However, both these results of Hb and ESR did not show significant difference between the groups.

With regard to bio-chemical parameters, both study drug and control drug has anti-inflammatory properties, this is shown as decrease in TNF Alpha and improvements in Hs-CRP scores in both groups (in

subjects with positive Hs-CRP at baseline turned negative after study period). Though the study group showed improvement, it was not statistically significant.

As per literature, study drug has positive effects on both humoral immunity and cellular immunity and thus it shows improvement in INF Gamma. And, in elderly as age progresses the DHEAS levels decline to about 10-20% of young individuals. Thus the decrease in DHEAS levels in study group may be because of age related decrease and may not be related to trial drug.

With regard to 6-Minute Walk Test, In Group A, there was 10.3% improvement at $p=0$, which is statistically highly significant. But in Group B there was 6.25% improvement at $p=0.005$, which is statistically significant. Thus, it can be stated that the trial drug helps in improving physical health of the individual by increasing their functional capacity due to its rejuvenative and aphrodisiac action as it is helpful in improving the utsaha and parakrama.

With regard to WHO QOL-OLD Module, FACET I comprised of the sensory abilities. Some of the subjects in the study had refractive errors majorly compared to other sensory disabilities and thus some improvement was seen in Group A compared to Group B, however it was not statistically significant. FACET II comprised of autonomy in old age, the ability to take their own decisions, do the activities on their own, here again the study group showed better scores, however it was not statistically significant. FACET III referred to achievements of the subjects in the past, opportunity to achieve the same in present, looking forward into their future, and FACET IV comprised of level of activity, quality of activity and their participation of activities of community respectively. Both these scores showed no significant difference between Group A and Group B. we feel our sample size was small and study period brief to have any significant results effect on these FACETS. FACET V comprised fear of death and FACET VI feeling of companionship respectively, most of our study subjects were married and having a lovely family, thus study showed no significant difference in these scores.

Thus *Vriddadaru Rasayana*, with regard to all above mentioned parameters, though did not show improvement, was not inferior to control drug and can be incorporated into routine usage as *rasayana* in elderly.

CONCLUSION

Rasayana therapy serves both the aims of *ayurveda* that is preserving the health of a healthy individual and curing the illness. *Rasayana* therapy helps to improve both qualitative and quantitative aspects of life. Due to its benefits such as achieving *dheergayu*, improving *smriti* and *medha*, *vayahsthapana* and *jaravyadhinashana* it has been included under the eight major branches of *ayurveda*. Though when compared to active control *Bhargavaprokta rasayana* no significant difference was found, *Vriddadaru rasayana* showed significant improvements in *ayurvedic* parameters like *twakparushata*, *slata asti*, *slata sandhi*, *smarana*, *utsaha hani*, *parakrama hani*. Also, there was improvements in objective parameters like DHEAS hormonal assay, Hs-CRP, TNF α and INF γ , 6MWT in *Vriddadaru group*. This can be justified as *Vriddadaru* does *vatashamana*, balancing the *doshas*, increasing the *utsaha* and *parakrama* and helps in improving the *agni* thus helping in *dhatuposhana* in the elderly.

LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

Sample size of study was small. Future studies can be planned with larger sample size and with different combinations of *rasayana*. Studies with subjects equally influenced by food, lifestyle and environment can be planned.

REFERENCES:

1. Geriatrics in Ayurveda by dr. S. Suresh Babu, chaukhamba orientalia, Varanasi, Reprint 2013, part-1, Geriatrics profile, P-11.
2. Sushruta. Susrutha Samhita with Nibandha sangraha commentary by Sri Dalhanacharya and Nyaya Chandrika panjika Commentary by Sri Gayadasacharya, Edited by Vaidya Yadavji Trikamji Acharya and Narayan Ram Acharya Kavyathirtha: Varanasi: Chaukhambha Sanskrit Sansthan; Reprint 2012. P-155.
3. Sushruta. Susrutha Samhita with Nibandha sangraha commentary by Sri Dalhanacharya and Nyaya Chandrika panjika Commentary by Sri Gayadasacharya, Edited by Vaidya Yadavji Trikamji Acharya and Narayan Ram Acharya Kavyathirtha: Varanasi: Chaukhambha Sanskrit Sansthan; Reprint 2012. P-114.

4. Sushruta. Susrutha Samhita with Nibandha sangraha commentary by Sri Dalhanacharya and Nyaya Chandrika panjika Commentary by Sri Gayadasacharya, Edited by Vaidya Yadavji Trikamji Acharya and Narayan Ram Acharya Kavyathirtha: Varanasi: Chaukhambha Sanskrit Sansthan; Reprint 2012. P-114.
5. Agnivesha. Charaka Samhita, with Ayurveda Dipika commentary by Chakrapanidatta, edited by Vaidya Yadavji Trikamji Acharya. Varanasi: Chaukhambha Subharati Prakashan;2013. P-298.
6. Sushruta. Susrutha Samhita with Nibandha sangraha commentary by Sri Dalhanacharya and Nyaya Chandrika panjika Commentary by Sri Gayadasacharya, Edited by Vaidya Yadavji Trikamji Acharya And Narayan Ram Acharya Kavyathirtha:Varanasi: Chaukhambha Sanskrit Sansthan; Reprint 2012. P-3.
7. Agnivesha. Charaka Samhita, with Ayurveda Dipika commentary by Chakrapanidatta, edited by Vaidya Yadavji Trikamji Acharya. Varanasi: Chaukhambha Subharati Prakashan;2013. P-377.
8. Sushruta. Susrutha Samhita with Nibandha sangraha commentary by Sri Dalhanacharya and Nyaya Chandrika panjika Commentary by Sri Gayadasacharya, Edited by Vaidya Yadavji Trikamji Acharya And Narayan Ram Acharya Kavyathirtha:Varanasi: Chaukhambha Sanskrit Sansthan; Reprint 2012. P-499.
9. Sri Vaidhya Sodhala: Gadanigraha, Indradeva Tripathi: Vidyotini Hindi Commentary, Sri Ganga Sahaya Pandeya: Editor, Varanasi: Chaukhambha Sanskrit Sansthan, Edition: Reprint 2011, vol-3, P-659.
10. Reddy, R., Srinivas, P., Giri, S., Marlewar, S., Devi, K. and Kumar, K., 2017. Clinical Efficacy and Safety of Chyavanaprasha on Aging in Apparently Healthy Elderly Subjects: A Prospective, Open-label, Multicenter Study. *Journal of Research in Ayurvedic Sciences*, 1(2), pp.81-89.
11. Power M, Quinn K, Schmidt S, Group W-O. Development of the WHOQOL-Old Module. *Quality of Life Research*, 2005; 14(10): P-2197–214.
12. ATS Statement. *American Journal of Respiratory and Critical Care Medicine*. 2002;166(1): P-111-117.
13. Gokhale AB, Damre AS, Saraf MN. Investigations into the immunomodulatory activity of *Argyrea speciosa*. *J Ethnopharmacol*. 2003; 84: P-109–14. [PubMed: 12499085]
14. Bachhav RS, Gulecha VS, Upasani CD. Analgesic and inflammatory activity of *Argyrea speciosa* root. *Indian J Pharmacol*. 2009; 41: P-158–61. [PMCID: PMC2875733] [PubMed: 20523865]
15. Joshi H, Kaur N, Chauhan J. Evaluation of Nootropic effect of *Argyrea speciosa* in mice. *J Health Sci*. 2007; 53: P-382–8.

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Declaration of competing interest

Nothing to declare.

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