

Effect of Rasayana Therapy on Ageing: An Ayurvedic Perspective¹

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Abstract

Ageing is a multidimensional process of physical, psychological and social change. Ayurveda Rasayana² therapy has given powerful contribution to overcome age related disorders and act essentially on nutrition dynamics and rejuvenate the body and the mind. The present study has been carried out to assess the effect of Guduchyadi Rasayana³ on Agnibala⁴, Dehabala⁵ and Sattvabala⁶ on elderly individuals. 138 patients were registered to the study and divided in to two groups. The drugs were prepared as granules form and administered three times per day and continued for three months. Result of the study revealed that the trial group obtained statistically significant improvement in the signs and symptoms of Agnibala, Dehabala and Sattvabala on elderly individuals.

Keywords: Ageing; Guduchyadi Rasayana; Rasayana Therapy

1. This paper is based on the PhD research work carried out at Institute for Post Graduate Teaching and Research in Ayurveda at Gujarat Ayurved University, Jamnagar, India, 2011.

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2. Rejuvenation

3. Name of the trial drug

4. Power of digestion and metabolism

5. Strength of body

6. Strength of the mind

Introduction

Ageing is essentially a physiological phenomenon usually defined as the progressive loses of biological functions accompanied by decreasing fertility and increasing mortality with advancing age. It represents structural and functional changes of an organism over its life span. Ayurveda considers ageing as *Jaivika swabhava*⁷ or biological nature of the living being and believes in the natural cycle of birth-senescence-death-rebirth as the very destiny of life (Singh, 2008).

*Tridosha*⁸ *Dhatus*⁹ and *Agni*¹⁰ in Ageing

As per the fundamental principles of Ayurveda the balance state of *vata*¹¹, *pitta*¹² and *kapha doshas*¹³ maintains the health of an individual by controlling the physiological factors in the body. Ayurveda *Susruta Samhita* has clearly emphasized that the *vata dosha* increases greatly during old age (Sharma, 1999). So it is responsible for most of the manifestations of ageing. There are tendencies of gradual diminution of all *dhatus*, *indriyas*¹⁴, *ojas*¹⁵ during ageing because in old age *vata* predominates and its fundamental properties precipitates the *sosana*¹⁶ and *kshaya*¹⁷ of different *dhatus* which are responsible for the most of the manifestations of ageing. Ayurveda has elaborated that *Agni* represents the digestive and metabolic functions of the body which consists of the digestive juices and different kinds of hormones, enzymes and co-enzymes. The optimum activity of *Agni* maintains the vigor and vitality of an individual and also keeps up the growth, development of the body (Singh, 1998). According to Ayurveda with the advancing age that *Ahara rasa*¹⁸ will not be able to produce satisfactory in elderly persons by nourishing since their tissues are over matured by geriatric decay (Sharma, 1999).

7. Biologically natural phenomenon

8. Three major biological components of the living body

9. Tissues

10. Digestion and metabolism

11. Motional energy component

12. Chemical moieties

13. Solid substratum of the body

14. Cognitive and conative functions

15. Immunity

16. Involution

17. Atrophy

18. Essence of food

Importance of Rasayana on Ageing

According to the modern discipline that ageing is probably the result of the breakdown of the cellular safety nets. Some of the causes are unavoidable such as ultraviolet radiation, free radicals and genetic effects, environmental and behavioral influences. Free radicals which are highly reactive and can do tremendous damage to the cell. They are capable of attacking the healthy cells of the body causing them to lose their structure and the function. It appears to be a major contribution to ageing and degenerative disorders in ageing. Thus cell has responded to this threat by creating various enzymes that bind to free radicals and inactivate them which are called anti oxidants. So it has been reported by scientific studies that Ayurvedic *rasayana* formulations are potent anti oxidant drugs and having immunomodulatory, anti stress and cytoprotective properties.

Ayurveda *Rasayana Tantra* which is exclusively committed to the science of ageing and its prevention with the help of *rasayana* or rejuvenation therapy. It consists of drugs and specific therapeutic measures which act on *Dhatu*, *Agni*, *Srotas*¹⁹ in the body and results healthy tissues development in the body. Ultimately it gives to the person long life, immunity, strength, happiness and intellect promotion. So all these improvements are considered as anti aging effects.

Therefore considering above all literary views and ideas the present study has been designed to evaluate the effect of Ayurvedic *Rasayana* formulae in ageing with following objectives:

Objectives of the Study

- a) To assess the therapeutic potential of the trial drug on *Agni bala*, *Dehabala*, and *Sattvabala* of aged individuals.
- b) To evaluate the *Rasayana* effect of the trial drug on haematologically and biochemically on elders.
- c) To assess the antioxidant activity of the trial drug.

19. Microcirculation

Data and Sampling

Patients attending to the Out Patient Department (OPD) and Inward Patient Department (IPD) of Department of *Kayachikitsa* of Institute for Postgraduate Teaching and Research in Ayurveda (IPGT & RA) Hospital in Jamnagar at Gujarat Ayurved University is the place where the study is conducted and purposive sampling technique was adopted irrespective of their sex, religion, occupation etc.

Criteria of Inclusion

The patients belonged to age group 55-75 years were included to the present study.

Criteria of Exclusion

The Patients aged below 55 years and above 75 years,

Patients are suffering from Diabetes mellitus, Neoplasms, Stroke, Intracranial haemorrhage and any medical disorder that could produce cognitive deterioration.

Patients having renal, respiratory, cardiac, metabolic, endocrine, history of alcoholism or drug dependence, Alzheimer's diseases, tuberculosis etc were excluded.

Plan of the Study

The patients who were subjected to the haematological and biochemical investigation as well as fulfilling the criteria were registered to the study and the special clinical proforma prepared has been used for this purpose.

Drugs and Dosages

Trial drug is found in Ayurvedic authentic text *Chakradatta* (Sharma, 2007) and it was prepared by adding Ghee and *Sharkara*²⁰ to convert to the granules form and 5g at a time is administered three times per day for the patients in group - A (Brahmasankar , 2002).

Control drug was prepared only with *Sharkara* and Cow Ghee in the form of granules and 3 g at a time is administered three times per day for the patients in group - B.

20. Sugar

Duration of Clinical Trial

The selected patients were randomly divided in to two groups viz.

Group - A

Patients were given only *Guduchayadi Rasayana* for three months.

Group - B

Patients were given only *Sharkaradi*²¹ granules for three months.

Subjective Parameters for the Assessment

- a) Previously published and approved scoring methods have been adopted to find out *Agni bala*, *Deha bala* and *Sattva bala* (Agrawal & Baghel, 2008).

Objective Parameters for the Assessment

- a) Haematological Full Blood Count
- b) Biochemical - Fasting Blood Sugar level, Serum Protein level, Serum Cholesterol level and
- c) Anti oxidant activity of the trial drug has been evaluated using *in Vitro*²² models and ABTS²³ (2, 2 azino-bis 3- ethyl benzothiazoline-6 sulfonic acid) methods.

Follow up Study

After the completion of full treatment course the patients were advised to report to the clinic monthly for the follow up.

21. Name of the control drug

22. *In vitro* studies in experimental biology are those that are conducted using components of an organism that have been isolated from their usual biological surroundings in order to permit a more detailed or more convenient analysis that can be done with whole organisms. Colloquially, these experiments are commonly called "test tube experiments".

23. 2, 2 azino-bis 3- ethyl benzothiazoline-6 sulfonic acid

Statistical Analysis

The obtained data has been analyzed statistically by adopting student's t-test as paired and unpaired. Paired' test in order to find out effect of therapy in patients group A and B. Unpaired is used to evaluate the comparative effect between group A and B. The obtained results were interpreted that value of $p < 0.001$ or $p < 0.01$ as statistically highly significant, $p < 0.05$ is considered as statistically significant and $p > 0.05$ is insignificant as per the analysis.

Observations

In this study total 138 patients were registered. 43 patients in trial group and 56 patients in control group completed the treatment while, 30 in trial and 9 patients in the control groups discontinued. There were 60.8% of patients belonged to the age group of 55-64 years and 60% were female.

Effect of Therapy on Agnibala

The Table 1 reveals the effect on *Abyavaharana shakti*²⁴ that 91.41% of improvement was obtained by group A patients. When the effect is compared improvement of group A patients was statistically highly significant than group B at the level of $p < 0.001$. On *Jarana shakti*²⁵ 90.3% of improvement was obtained by group A and 71.81% was found group B. When the effect is compared effect of group A shows statistically highly significant improvement than group B at the level of $p < 0.01$. Regarding the effect on feeling of well being 89.7% of achievement had been obtained by group A while, 70.38% from group B and comparative effect group A shows statistically highly significant relief than group B at the level of $p < 0.01$.

Effect of Therapy on Dehabala

The Table 2 on *Bala vridhhi*²⁶ 88.37% of improvement was obtained by group A while 63.54% from group B and so far the comparative effect is concerned group A showed statistically highly significant improvement than group B at the level of $p < 0.01$.

24. Capacity to ingest

25. Capacity to digest

26. Assessment of body strength

Table 1: Comparative Effect of Group A with Group B on the Symptoms of Agnibala

Serial No	Signs and Symptoms of Agnibala	df	Percentage of Relief Group A	Percentage of Relief Group B	Mean Difference	S . E	t Value	P Value
1	Abyavaharana shakti	97	91.41	69.4	0.656	0.125	5.239	<0.001
2	Jarana Shakti	97	90.3	71.81	0.416	0.130	3.183	P<0.01
3	Sukhena cha pratibodhanam	97	89.7	70.38	0.342	0.114	2.976	P<0.01

Notes: df - Degree of freedom, S.E - Standard error

Source: Compiled by author based on survey data

Table 2: Comparative Effect of Group A with Group B on the Symptoms of Dehabala

Serial No	Signs and Symptoms of Dehabala	df	Percentage of Relief Group A	Percentage of Relief Group B	Mean Difference	S.E	t	P Value
1	Shanira Upachita Mamsa*	97	33	51.78	-0.367	0.252	-1.451	>0.05
2	Swara Varna Prasada**	97	81.7	71.42	0.145	0.134	1.080	>0.05
3	Bala Viddhi***	97	88.37	63.54	0.518	0.152	3.391	P<0.01

Notes: df - Degree of freedom, S.E - Standard error

*Body built assessed by weight, **Facial expression, ***Assessment of body strength

Source: Compiled by the based on survey data

Table 3: Comparative Effect of Group A with Group B on the Symptoms of Sattvabala

Serial No	Signs and Symptoms of Sattvabala	df	Percentage of Relief Group A	Percentage of Relief Group B	Mean Difference	S.E	t	P Value
1	Nidra Labhoyata Kalam*	97	86.82	80.80	0.118	0.145	0.813	>0.05
2	Sukhena Cha Pratibodhanam**	97	96.51	77.08	0.412	0.110	3.734	0<0.001
3	Vaikarika Swapnanam Adarshanam***	97	90.69	77.08	0.017	0.114	0.149	>0.05
4	Mano Buddhi Indriya Avyappatti****	97	86.04	80.85	0.103	0.107	0.960	>0.05

Notes: df - Degree of freedom, S.E - Standard error

*Sleep at proper time, **Feeling of well being after getting-up bed, ***Various dreams are not seen, ****No any psychological disturbances

Source: Compiled by the based on survey data

Effect of Therapy on Sattvabala

Table 3 shows effect on *sattvabala* that *Sukhena cha prati-bodhanam*²⁷ 96.51% of improvement has achieved by group A while, 77.08% given by group B and so far the comparative effect is concerned group A showed statistically highly significant improvement than group B at the level of $p < 0.001$.

Effect of Therapy on Haematological Parameters

When the effect of therapy on haemoglobin percentage is considered 1.34% increase had been achieved by group A and it was statistically significant at the level of $p < 0.05$ while 1.55% decrease had been achieved by group B. Effect on total Red Blood Cells (RBC) count was observed with 20% increase by group A and it was statistically highly significant at the level of $p < 0.01$ as well as Packed Cells Volume (PCV) had increased 1.30% by group A and it was statistically significant at the level of $p < 0.05$ while 3.34% decrease by group B. Effect on Erythrocyte Sedimentation Rate (ESR) was 7.40% decrease showed by group A and it was statistically significant at the level of $p < 0.05$ and insignificantly increased 24.43% by group B. Effect on lymphocyte count was 7.30% decrease showed by group A and it was statistically highly significant at the level of $p < 0.01$ and insignificantly decrease (1.69%) showed by group B. Other haematological parameters values were within the normal limits in both groups before the treatment and remained normal after the completion of the therapy.

Effect of Therapy on Biochemical Parameters

The effect on Fasting blood sugar, Serum protein, Serum creatinine and Serum Glutamic Pyruvic Transaminase (SGPT) values were within normal limits in both groups before and after the treatment. The blood urea level showed a highly significant decreased 13.80% of group A patients at the level of $p < 0.01$ while 10.04% has increased by group B. But blood urea values were within the normal limits in both groups before and after the treatments. Further, it has been observed that Serum cholesterol level had decreased 5.49% by group A which was statistically highly significant at the level of $p < 0.01$ while group B has given statistically insignificant at the level of $p > 0.05$.

27. Feeling of well being after getting up from the bed

The result from ABTS assay showed that the water extract *Guduchyadi Rasayana* has potent Antioxidant activity with percentage inhibition of IC_{50} $101.8 \pm 7.0 \mu\text{g/ml}$ while, the same for control drug is not detected.

Discussion

As per the Ayurvedic principles the ageing is a *swabhava*²⁸ or natural phenomena of life (Sharma, 1999). *Charaka samhita* mentions that the functional diminution of *dhatu*, *ojas*, strength of sense organs, power of cognition, strength of the body and valour are gradually decreasing during old age (Sharma & Dash, 2002). So effect of therapy of *Rasayana* affords comprehensive physiologic and metabolic restoration and gives important contribution to minimize these difficulties, including mental development and resistance against diseases among elders. Because *Rasayana* drugs and therapeutic measures act on *Dhatu*, *Agni*, *Srotas* and produce healthy tissues development in the body and in turn it provide a person longevity, immunity, resistance against disease, strength, happiness and intellect promotion in the mind (Singh, 2008).

a) Effect on *Agnibala*

From Ayurveda view point the *Agni* denotes the digestion and metabolism in the body (Sharma & Dash, 2002). It is considered to be the root or the most important sustaining factor of living beings. *Agni* has been observed by using *Anumana pariksha*²⁹ with reference to the *Abyavaharanashakti* and *Jaranashakti* in the human body (Sharma & Dash, 2002). In this study it was found that the majority of the elderly individuals were having derangement of *Agni*. After administration of *Guduchyadi Rasayana* a better improvement was achieved. Because most of the ingredients in the trial drug possess properties increasing digestive functions in the body. *Tinospora cordifolia* wild, *Acaenanthus aspera* Linn, *Embelia ribes* Burm.f., *Convolvulus-pluricaulis* chois, *Terminalia chebula* Zetz, *Saussurea lappa* C.B Clarke and *Acorus calamus* Linn. Furthermore, the pharmacological study has proven that Acetone extractor of *Saussurea lappa* C.B Clarke and costunolide which is major chemical constituents of *Saussurea lappa* C.B clark inhibit ulcer formation and increased bile secretion in mice (Yamahara et al. 1985). More over, that embelin which is the

28. Natural

29. Inference

major chemical constituents of *Embelia ribes* Burm.f., was found to enhance the absorptive and digestive functions of rat intestine (Gupta et al. 1991). So trial group obtained better relief than control group. Because the optimum activity of *Agni* provide vigour and vitality of an individual and perform healthy and enthusiasm. Ayurveda *Caraka Samhita* clearly emphasizes the effect of *Rasayana* therapy and most of the ingredients of *Guduchyadi Rasayana* are having property of *Rasayana* (Sharma & Dash, 1996).

b) Effect on Dehabala

Regarding the effect on *Bala vridhhi* that the comparative effect shows statistically highly significant at the level of $P < 0.01$. So trial drug provides better improvement than control drug. In Ayurveda *Ojas* is known as *Bala* in the body (Sharma, 1999). It provides strength to the body in terms of physical, mental, immunological strength and resistance to diseases (Singh, 2005). Majority of aged individuals found to have affected their *Bala* in the body. Furthermore, Pharmacological studies have proven that *Guduchi*, *Vidanga*, *Sankapushpi*, *Kustha* and *Shatavari* ingredients possess the the property of immunostimulant. Moreover, the water and ethanolic extract of *Guduchi* stem inhibited the cyclophosphamide induced immuno suppression (Manjekar et al., 2000). It is proved that immunomodulatory effects are ascribed to the root of *Shatavari* (*Asparagus racemosus*) (Rege et al., 1989). Furthermore, control group also has shown considerable improvement of *Bala* due to its property *Balya* particular to the ingredients of *Ghee* and *Sharkara* (Sharma, 1999).

c) Effect on Sattvabala

So far, the mental health of the elderly patients of this study is concerned the majority of the patients were not seen in a happy and healthy mood before the treatment. It was found that they were under different mental disorders such as anxiety, anger, fear, depression, worries etc as they were not having proper sleep. In Ayurveda *Caraka Samhita* has mentioned that the mental tension disturbs to the sound sleep. So it has been observed *Guduchyadi Rasayana* has given better improvement of *sattvabala* after the treatment. This enable person to subsiding mental tension and the potencies have already proven by the pharmacological studies. The table 4 has illustrated the pharmacologically proved therapeutic potencies of ingredients of the trial drug (Billore et al., 2005; Sharma et al., 2001; Sharma et al., 2000).

Table 4: Therapeutic Potential of Some Ingredients of Guduchyadi Rasayana

Ingredients	Botanical Names	Pharmacological Properties
Guduchi	<i>Tinosporacordifolia</i> Wild	Antistress, CNS Depressant
Shankapushpi	<i>Convolvulus Pluricaulis</i> Chois	Anti-stress, Anti-anxiety, Sedative, CNS Depressant,
Vacha	<i>Acorus Calamus</i> Linn	Sedative , Tranquilizer, CNS Depressant
Haritaki	<i>Terminalia Chebula</i> Zetz	Antistress , Purgative , Hypotensive

Source: Database on medicinal plants used in Ayurveda.

d) Effect on Haematological Parameters

It can be decided that the *Rakta dhatu*³⁰ is improved as a result of treatment with *Guduchyadi Rasayana* which is attributed to the Pharmacokinetic properties of the ingredients (Sharma et al., 2001; Sharma et al., 2002).

Further , pharmacological studies have proved that the *Vacha*, *Haritaki* and *Kustha*³¹ are having properties of Antibacterial, while *Apamarga*³² having properties of Anti microbial and Antibacterial, *Vidanga*³³ having properties of Antibiotic and Anti tubercular, *Sankhapushpi*³⁴ having properties of Antimicrobial and Anti inflammatory, *Shatavar*³⁵ having properties of Phagocytic and Antibacterial (Billore et al., 2005; Sharma et al., 2001). Those potentials may have reduced ESR value. Hence it gives valuable information that the *Guduchyadi Rasayana* provides better health status to the elderly patients. Moreover, *Guduchi*, *Vidanga* and *Kustha* possess properties of Immunostimulant. This has an impact on neuro humoral immunity system which is exhibited by maintaining normal Lymphocytic count.

30. Haemopoietic

31. *Saussurea lappa* C.B. Clarke

32. *Acarenthus aspera* Linn

33. *Embelia ribes* Burm.f

34. *Convolvulus Pluricaulis* Chois

35. *Asparagus Racemosus* wild

e) Effect on Biochemical Parameters

Fasting Blood Sugar, Serum Protein, Serum Creatinine and SGPT values were within the normal limits in both groups before the treatment and remained normal even after the treatment. Further normal value of SGPT reveals that the both drugs do not have any toxic effects to the patients during treatments.

On the basis of reduction of serum cholesterol values it has been revealed that *Guduchyadi Rasayana* has supported to Tissue Metabolism to be normalized. So it reflects as a normalization of all ongoing physiological, chemical, molecular and atomic processes in the body. Hence serum cholesterol has come to the normal level after the treatment. Further, Pharmacological studies have proven that *Haritaki* and *Kustha* are having *Medohara*³⁶ effect (Sharma et al., 2001; Billore et al., 2005).

f) Antioxidant Activity of the Trial Drug

The data of this study revealed that the *Guduchyadi Rasayana* has its potency of anti-oxidant activity that helped combat Ageing. The radical scavenging activity of the sample was calculated as percentage inhibition activity compared to absorbance in assay control and expressed as IC_{50} value $101.8 \pm 7.0 \mu\text{g/ml}$. So this property would be helped to combat Ageing.

Conclusion

Finally, it can be concluded that the trial drug *Guduchyadi Rasayana* has following potentials by which the deranged *Agnibala*, *Dehabala* and *Sattvabala* of aged people have been improved. The trial drug normalizes the function of *Agni* and thereby it regularizes digestion and tissue metabolism in elderly individuals and provided strength to the body. Furthermore, it has given better improved *Sattvabala* with the potentials of Anti-stress, Anti-depressant, Anxiolytic, Sedative and Tranquilizer. Moreover, that *Guduchyadi Rasayana* has provided haemopoietic, hypolipidaemic, and antioxidant and nontoxic effects on elders. So the trial drug *Guduchyadi Rasayana* can be used as an effective treatment in the management of Age related disorders.

36. Hypolipidaemic

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