



Research Article

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EVALUATION OF RASAYANA (REJUVENATIVE) EFFECT OF AMALAKI (*EMBLICA OFFICINALIS*) IN HEALTHY VOLUNTEERS

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ABSTRACT

Ayurveda is unique system of medicine which has holistic approach to treat individuals. Ayurveda is divided into eight branches. Rasayana is one of them. Rasayana is a therapy mainly aiming for prevention from untimely ageing (Akalaja Jara) and diseases which deteriorate the life in old age. Properly used Rasayana drugs, diet, regime gives wonderful results. Amalaki (*Embllica officinalis*) said to be the best vayasthapana¹ and Rasayana drug². 10 healthy volunteers of age group 40-60 years old were treated with Amalaki (*Embllica officinalis*) juice as per basic fundamentals of Rasayana (Rejuvenation) chikitsa. Rasayana (Rejuvenative) effects were evaluated on scientific parameters. Rasayana (Rejuvenative) effects were assessed on symptomatic, haematological, biochemical, physiological and functional parameters. Rasayana effects Prabha (glow of skin), varna (complexion), Dehbal (physical capacity), old age related changes (wrinkles on skin) ($p < 0.001$) were found to be statistically significant. In biochemical parameters, its hypocholesterolaemic ($p < 0.05$) and triglyceride ($p < 0.05$) lowering action has been proved. It also increases serum high density lipoproteins ($p < 0.001$) which were encouraging. Amalaki (*Embllica officinalis*) offers best Rasayana (Rejuvenative) effect.

Keywords: Rasayana, Rejuvenation, Amalaki (*Embllica officinalis*), vayasthapana, hypocholesterolaemic, hypolipedaemic, Antioxidant.

INTRODUCTION

Amalaki (*Embllica officinalis*) was selected for Rasayana. Acharya Charaka has mentioned Amalaki (*Embllica officinalis*) a best vayasthapana¹ drug. It has properties like Rasayana², chakshushya, sarvadoshaghna and vrushya³. Amalaki (*Embllica officinalis*) fruit is probably the richest known natural source of vitamin C⁴. The current understanding about the role of “free radicals” is quite contributory to have an insight about the mode of action of Rasayana drugs. The Recent studies done on Rasayana preparation highlight the antioxidant property of many widely used rasayana drugs⁵. Allen and Shoal 1990, suggests that ageing occurs because of the interference of oxidative stress on specific genetic programme. Reported age related changes in gene expression could possibly also result from oxidative stress⁶. The drug Amalaki (*Embllica officinalis*) has been proved as an antioxidant⁵. Vitamin C has been reported to be an important hypocholesterolaemic and hypolipedaemic agent⁷. Rasayana therapy was aimed for decreasing the susceptibility of cell to injury and also removal of the injurious factors including hyperlipidaemia. Amalaki (*Embllica officinalis*) has been shown too helpful in both aspects.

Aim

The aim of this study was to evaluate Rasayana (Rejuvenation) effect of Amalaki (*Embllica officinalis*) on the basis of scientific parameters.

Objective

The objective of this study was to study the Rasayana effects on symptomatic, physiological, functional, hematological and biochemical parameters.

MATERIALS AND METHODS

Evaluation of Rasayana (Rejuvenative) effect of Amalaki (*Embllica officinalis*) was carried out in healthy volunteers with Institutional ethical clearance number E-No. 96/40380.

Selection of Volunteers

10 healthy Volunteers were selected of age group 40-60 years. for the trial.

Clinical assessment

Symptomatic improvement

Rejuvenation effects were observed on Prabha (glow on skin), Varna (complexion), Dehbal (physical capacity), Swara (voice), Indriyabal (sense organ), general health, old age related changes (wrinkles on skin), psychological improvement and visual improvement.

Physiological improvement

Physiological assessment was done on change in body weight in kg, systolic and diastolic blood pressure, pulse rate per minutes, rate of respiration per minutes and breath holding time in seconds.

Functional Assessment was done on grip power in mm of Hg. and walking time in minutes.

Haematological investigations parameters included TLC (Total leukocyte count), DLC (Differential leukocyte count), Hemoglobin % (g %) and E.S.R. (Erythrocyte sedimentation rate / 1 hour).

Biochemical investigations include HDL (High density lipoproteins), LDL (Low density lipoproteins), VLDL (Very low density lipoproteins), triglycerides and serum cholesterol.

Selection of Drug

The drug Amalaki (*Emblica officinalis*) is said to be the best vayasthapana¹ and Rasayana drug². It was selected for evaluation of Rasayana effect.

Samshodhana

According to basic fundamentals of Rasayana chikitsa, samshodhana is essential prior to start rasayana drug treatment.

First day payasa (rice boiled in milk with udad dal (Black gram) and ghee in large quantity) was given at night⁸.

Second day hot water bath was given at morning for swedana and Haritakyadi yog⁹ was given at night. Haritakyadi yog contains equal quantity of Haritaki (*Terminalia chebula*), Saindhav (Rock salt), Aamalaki (*Emblica officinalis*), Guda (Jaggery), Vacha (*Acorus calamus*), Vidang (*Embelia ribes*), Rajani (*Curcuma longa*), Pimpali (*Piper longum*) and Sunthi (*Zingiber officinalis*).

Haritakyadi yog

Mode of administration	orally
Preparation of drug	Granule form
Dose	10 grams
Anupana	Lukewarm water
Time of administration	At bed time
Duration	3-7 days (depending upon koshta. mrudu-3 days, madhyam-5 days, krura-7 days.

Administration of drug (Amalaki)

Mode of administration	orally
Preparation of drug	juice
Dose	100 ml daily
Time of administration	Morning (Empty stomach-Apan kala)
Duration of treatment	30 days.

Diet

Daily one time diet containing two chapati (roti made by wheat flour) and 100 grams mung dal (Boiled green gram) was recommended. Adequate milk was recommended as pathya whenever volunteers feel appetite.

RESULTS

Rejuvenation effects showed that Prabha ($P < 0.001$), Varna ($P < 0.01$), Dehbala ($P < 0.05$) were improved significantly. Improvement in Prabha was observed highly significant than other Rejuvenation effects. Symptomatic improvement in mental morbidity ($P < 0.01$), general health ($P < 0.05$), visual impairment ($P < 0.01$) were found significant. Old age related changes were improved highly significant ($P < 0.001$). Psychological improvement was observed significant ($P < 0.05$). Subjective improvement was found highly significant ($P < 0.001$) (Table 1).

Biochemical investigations showed significant decrease in total cholesterol ($P < 0.05$), triglycerides ($P < 0.05$). It indicates that Amalaki has hypocholesterolaemic effect. Highly significant increase in High density lipoprotein (H.D.L.) ($P < 0.001$) was found; which was encouraging result whereas selected drug was found to be effective in increasing good cholesterol and decreasing bad cholesterol (Table 2).

Hematological investigations results showed that erythrocyte sedimentation rate (E.S.R.) was decreased significantly ($P < 0.05$), hence the drug was not found to have significant effect on Haemoglobin %, Total leukocyte count and Differential leukocyte count (Table 3)

In physiological changes, weight was increased significantly ($P < 0.01$), systolic and diastolic blood pressure was increased significantly but didn't cross the normal blood pressure level. Thus effect considered as normotensive. Pulse was significantly decreased ($P < 0.05$) but not below the normal pulse rate / minute. This effect also indicates that the action of drug was always tends to maintain homeostasis (Dhatu-samyā) of body (Table 4). Breath holding time was significantly increased ($P < 0.001$) (Table 5).

Functional assessment showed the increase in grip power of both hands and decrease in walking time were observed significantly. It indicates Dehbal (Physical capacity) of volunteers increased after the trial (Table 6).

Table 1: The pattern of symptomatic improvement (Rasayana effect) in 10 healthy volunteers (40-60 years) following treatment with Amalaki juice

S. No.	Observation	BT (Mean)	AT (Mean)	Mean Difference	S.D. of Mean difference	t (Paired test)	P
1.	Visual impairment	2.5	1.4	1.1	0.97	3.66	< 0.001
2.	Mental morbidity symptoms	1.9	1.3	0.6	0.51	3.75	< 0.01
3.	Subjective improvement	0.7	1.9	1.2	0.55	7.06	< 0.001
4.	General health	1.1	0.6	0.5	0.52	3.12	< 0.05
5.	Old age related changes	2.5	0.8	1.7	0.82	6.8	< 0.001
6.	Psychological improvement	0.8	1.2	0.4	0.51	2.5	< 0.05
7.	Prabha	1.1	2.3	1.2	0.42	9.23	< 0.001
8.	Varna	1.2	2.0	0.8	0.63	4.0	< 0.01
9.	Dehbal	1.5	1.9	0.4	0.52	2.5	< 0.05
10.	Swara	1.3	1.4	0.1	0.43	0.73	> 0.05
11.	Indriyabala	1.7	1.9	0.2	0.42	1.53	> 0.05

BT: Before Treatment, AT: After Treatment

Table 2: The pattern of lipid profile in 10 healthy volunteers (40-60 years) following treatment with Amalaki juice

S. No.	Observation	BT (Mean)	AT (Mean)	Mean Difference	S.D. of Mean difference	t (Paired test)	p
1.	Serum Cholesterol	189.71	143.47	46.24	46.28	3.15	< 0.05
2.	H.D.L.	41.25	59.93	18.68	11.94	4.95	< 0.001
3.	L.D.L.	115.94	85.87	30.07	54.59	1.74	> 0.05
4.	V.L.D.L.	32.51	27.76	4.75	7.71	1.94	> 0.05
5.	T.G.	162.57	105.66	56.91	56.70	3.17	< 0.05

BT: Before Treatment, AT: After Treatment

H.D.L. – High Density Lipoproteins, L.D.L. – Low Density Lipoproteins, V.L.D.L. – Very Low Density Lipoproteins, T.G. – Triglycerides

Table 3: Pattern of Hematological changes in 10 Healthy Volunteer's age 40-60 years treated with Amalki Juice

S. No.	Observation	BT	AT	Mean	SD +	t (paired test)	P
1.	Hb % (g %)	13.44	13.99	0.57	1.39	1.29	> 0.05
2.	E.S.R. (mm/1 hour)	12.5	7.9	4.6	5.34	2.73	< 0.05
3.	T.L.C. (/cu. Mm)	5900	6120	220	626.45	1.11	> 0.05

BT: Before Treatment, AT: After Treatment

Hb %-Hemoglobin %, T.L.C.- Total leukocyte count, D.L.C.-Differential leukocyte count, E.S.R.- Erythrocyte Sedimentation Rate

Table 4: Pattern of physiological changes in 10 Healthy Volunteer's age 40-60 years treated with Amalki Juice

S. No.	Observation	BT	AT	Mean	SD +	t (paired test)	P
1.	Systolic blood pressure mm Hg.	113.0	124.6	11.6	11.5	3.18	< 0.05
2.	Diastolic blood pressure mm Hg	75.8	78.0	2.2	8.18	7.09	< 0.001
3.	Pulse rate (/m)	77.8	74.4	3.4	3.65	2.95	< 0.05

BT: Before Treatment, AT: After Treatment

Table 5: Pattern of respiratory functions in 10 healthy volunteers treated with Amalki Juice

S. No.	Observation	BT	AT	Mean	SD +	t (paired test)	P
1.	Breath holding time	31.0	38.6	7.6	4.00	5.94	< 0.001
2.	Respiration Rate/m	18.0	17.8	0.2	2.78	0.22	> 0.05

BT: Before Treatment, AT: After Treatment

Table 6: Pattern of Dehbal (Physical strength improving status of body) in 10 Healthy volunteers

S. No.	Observation	BT	AT	Mean	SD +	t (paired test)	P
1.	Grip power of Rt. hand in (mm of Hg)	162.0	172.62	10.2	7.85	4.11	< 0.01
2.	Grip power of Lt. Hand in (mm of Hg)	129.0	136.6	7.6	2.95	8.17	< 0.001
3.	Walking time in minutes	18.0	16.6	1.4	1.27	3.51	< 0.01

BT: Before Treatment, AT: After Treatment

DISCUSSION

Acharya Sushruta has defined Rasayana which retards the ageing process, increase longevity, talent, vitality and make the body fit to overcome the factors causing ailments¹⁰. The drug Amalaki was selected which is having vayasthapana¹ and Rasayana² property. Dalhana who written commentary on Sushruta samhita has expressed his idea explaining the word vayasthapana which has got two meanings; first which maintains the age of hundred years or more and second which helps in alleviating the senility and maintaining young age for a longer time. The term Rasayana has a specific meaning. Drug, Diet & Regimens which promotes longevity, preventing untimely ageing and disease are called Rasayana. The effects of Rasayana therapy are longevity (good long life), memory (great), intelligence (perfect), good health, youthfulness, bright complexion, bold voice and magnanimity, increase strength of body and the sense organs.¹¹ Rasayana effects of Amalaki found in this study were as per classics¹¹ and these effects were assessed on objective scientific parameters.

Antioxidant defense systems represent longevity¹². Amalaki is having antioxidant property so it acts on longevity⁶.

Memory and intelligence come under psychological improvement. In present study psychological assessment has been done. The drug was effective in psychological improvement ($p < 0.05$). Also the drug was significantly decreases mental morbidity symptoms ($p < 0.01$). Both evidences show its effects on memory and intelligence.

General health of volunteers improved significantly ($p < 0.05$). From these improvements we can conclude that the drug was effective in improving health. Health is one of the most important Rasayan effect. Youthfulness is nothing but absence of old age related changes, sustains libido and valour. The drug was effective to reduce some sort of old age related changes specially wrinkles on skin and improve prabha (glow of skin) and varna (complexion).

The drug was found significantly effective to increase grip power of hands and reduced walking time. This result indicates the drug increases the strength of body (Dehbal). According to above discussed facts it can be inferred that Amalaki drug gives Rasayana effects as per classics¹¹. It offers best Rasayana effect.

CONCLUSION

Amalaki (*Embllica officinalis*) retards the untimely ageing (Akalaja Jara) process by its Rasayana (rejuvenative) effect. It prevents diseases among elderly by its hypocholesterolaemic, triglyceride lowering action. It also Increases serum high density lipoproteins which is encouraging. It also lowers E.S.R. (Erythrocyte Sedimentation Rate) may act on immune system. Thus it offers best Rasayana (Rejuvenative) effect.

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