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Clinical study on the combined effectiveness of *Mashasaptaka Kwatha* and *Marsha Nasya* with *Mashasaptaka Taila* in *Pakshaghata* (cerebrovascular accident-infarct)

Nidhi Gusain¹, Totad Muttappa², Vasantha B³, Yadu Gopan⁴

¹Post Graduate Scholar, Department of Kayachikitsa, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India.

²Associate Professor & HOD, ³Associate Professor, Department of Kayachikitsa, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India.

⁴Assistant Professor, Department of Kayachikitsa, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India.

ABSTRACT

Background: *Pakshaghata* is one among *Vataja Nanatmaja Vyadhis* which are considered as *Mahavyadhis*. *Pakshaghata* can be correlated with Hemiplegia, the commonest pathology of which is cerebrovascular accident (stroke). Stroke is defined as sudden onset of neurologic deficit from vascular mechanism. 85% of all strokes are ischemic and 15% are hemorrhagic. **Aims And Objectives:** To evaluate the combined effectiveness of *Mashasaptaka Kwatha* and *Marsha Nasya* with *Mashasaptaka Taila* in the management of *Pakshaghata* (Cerebrovascular Accident-infarct). **Methods:** Thirty diagnosed subjects of *Pakshaghata* (CVA due to infarct) were administered with *Mashasaptaka Kwatha* and *Marsha Nasya* with *Mashasaptaka Taila* for 7 days. The data of patients was recorded before and after treatment using an elaborate proforma. Assessment was done based on the primary and secondary outcome measures. For statistical analysis, Wilcoxon Signed Rank test, McNemar tests were used. **Results:** In this study it was found that there was statistically significant relief in the symptoms of *Pakshaghata* (Cerebrovascular accident-infarct). **Conclusion:** Relief in the symptoms was achieved by the drugs having properties such as *Vatakaphahara*, *Anulomana*, *Brimhana*, *Srotoshodhana* etc. Hence, *Mashasaptaka Kwatha* and *Marsha Nasya* with *Mashasaptaka Taila* for 7 days is effective in the management of *Pakshaghata* (Cerebrovascular accident-infarct).

Key words: *Pakshaghata*, Cerebrovascular Accident, *Mashasaptaka Kwatha*, *Marsha Nasya*.

INTRODUCTION

Vatavyadhi is considered to be one among the *Ashtamahagadas*.^[1] *Pakshaghata* is one among the 80 *Vatajananatmaja Vikaras* and is a *Roga* of *Madhyamarogamarga*.^[2] Gravity of the disease was perfectly judged by ancient physicians even the name

given suggests the egregious nature of *Pakshaghata*. *Pakshavadha* is used synonymously with *Pakshaghata*. 'Vadha' means to assassinate and 'Ghata' means to strike hard and suddenly. Both the words suggest a sudden appearance of strong symptoms and sequel like *Shiromarmaghata*, *Indriyanasha*, *Karmahani* and even death.

The etiopathogenesis of *Pakshaghata* is explained in classics^[3] in which the vitiated *Vata* resides in one half of body and causes *Shoshana* of *Sira* and *Snayu* leading to loosening of joints. This in turn leads to symptoms like *Cheshtanivrutti*, *Ruja* and *Vakstambha*.^[4] *Anya Dasha Anubandha Lakshanas* are also explained.^[5]

CVA is not a disease in itself but is heterogeneous group of disorders. Hemiplegia is one of the most frequent and commonest clinical presentations of CVA.^[6] A stroke or cerebrovascular disease, is defined as an abrupt onset of neurological deficit that is

Address for correspondence:

Dr. Nidhi Gusain

Post Graduate Scholar, Department of Kayachikitsa, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan, Karnataka, India.

E-mail: ng5.12.94@gmail.com

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attributed to a focal vascular cause. Stroke is the second major cause of death worldwide with 6.2 million dying from stroke in 2015, an increase of 830,000 since the year 2000.^[8] The world wide incidence has been quoted as 2/1000 population/annum; about 4/1000 in people aged 45-84 years.^[9] Over the last four decades the stroke incidence in low and middle-income countries has more than doubled. Community surveys in India have shown a crude prevalence rate for CVA in the range of 200 in 100,000 persons.^[10]

Eighty five percentages of stroke cases are due to cerebral infarction and fifteen percentages due to cerebral haemorrhage and 1.5 times more often in male than female,^[11] According to the India stroke fact sheet updated in 2012, the estimated age-adjusted prevalence rate for stroke ranges between 84/100,000 and 262/100,000 in rural and between 334/100,000 and 424/100,000 in urban areas.^[12]

The allopathic line of treatment for CVA is medical support, thrombolysis, antiplatelet agents, anticoagulation, neuroprotection and rehabilitation.^[13]

Pakshaghata Chikitsa explained by the classics mainly include *Snehana*, *Swedana* and *Virechana*.^[14] Detailed description of other line of treatment for *Pakshaghata* is also available such as *Snehana*, *Swedana*, *Mruduvirechana*, *Mastishkya*, *Salvanaupanaha* and *Basti*.^[15]

Mashasaptaka Kwatha is a multiherb decoction quoted to reduce the symptoms of *Pakshaghata* in 7 days.^[16] In this study it was administered orally and the *Taila* prepared out of the same formulation is used for *Nasya*.

Mashasaptaka kwatha is combination of *Masha*, *Bala*, *Kapikacchu*, *Eranda*, *Rasna*, *Ashwagandha* and *Katruna* taken along with *Hingu* and *Saindhava*. Majority of drugs in this formulation possess *Madhura Rasa* and *Ushna Veerya* which are *Vatashamaka*. *Masha*, *Bala* and *Hingu* also possess *Vedanashamaka* property. *Hingu* and *Saindhava* being *Teekshna* and *Sukshma* would have aided in removing the *Margavarna* present in the *Srotas* while the drugs like *Masha*, *Eranda*, *Kapikachu* and *Bala*, being *Brimhana*

and *Dhatuwardhaka* may have aided in relieving *Dhatukshaya*.

OBJECTIVE

To assess the combined effectiveness of *Mashasaptaka Kwatha* in a dose of 30ml thrice after food with *Anupana* of *Hingu* and *Saindhava* and *Marsha Nasya* with *Mashasaptaka Taila* twice daily for a duration of 7 days in the management of *Pakshaghata* (Cerebrovascular accident-infarct).

MATERIALS AND METHODS

Source of data: Patients who attended the in-patient department of Kayachikitsa at Sri Dharmasthala Manjunatheswara Ayurveda Hospital, Hassan.

Method of collection of data: Data was collected using specially prepared case report form. The Demographic data of 34 enrolled patients of *Pakshaghata* such as age, gender, educational status etc. was collected.

Screening of the patient

Diagnostic criteria - subjects with classical features of *Pakshaghata*

- *Cheshtanivritti*
- *Ruja*
- *Vaakstambha*

Inclusion criteria

- Subjects who are conscious and oriented
- Subjects fit for *Nasya*
- Subjects of either gender
- Subjects aged between 30-80 years
- Subjects who are ready to participate and sign the informed consent form

Exclusion criteria

- Subjects with uncontrolled diabetes mellitus and uncontrolled hypertension
- Diagnosed cases of haemorrhagic stroke, intra cranial space occupying lesion, Congenital defects and carcinoma, Intra cranial infections.

- Pregnant women and lactating mother

Sampling technique - Convenient sample

Sample size - 34

Statistical method

Analysis Data is entered using SPSS 23 and data is analyzed. For significance of change in Nominal data, McNemar test was performed for significance of change in Ordinal data Wilcoxon signed rank test was performed.

Ethical consideration

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Study design

The study was open label, single arm, exploratory, prospective clinical on 34 patients of *Pakshaghata* selected using the convenience/ purposive (nonrandom) sampling technique with pre and post-test design conducted in a tertiary Ayurveda hospital attached to quarters in southern India.

Treatment plan

- 1. Oral medication** - *Mashasaptaka Kwatha* 30ml tid A/F with *Hingu* (125mg) and *Saindhav* (350mg) as *Anupana*.
- 2. Procedure** - *Marsha Nasya* with *Mashasaptaka Taila* 8 Bindu, twice daily

Duration: 7 days

Source and authentication of raw drug

Required raw drug for the treatment were purchased from CKKM Ayurveda Pharmacy, Kerala, a GMP certified pharmacy and 1 drug was purchased from a local farm and authentication certificate was obtained from *Dravyaguna* Department of Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan.

Assessment criteria

Assessment was done based on the improvement in the primary and secondary outcome measures after the administration of the medicine for 7 days.

Primary outcome measures

Assessment was done based on the symptoms like *Cheshta Nivritti* (Table 1), *Vakstambha* (Table 2), *Ruja* (Table 3).

Secondary outcome measure

National Institute of Health (NIH) Stroke Scale, Modified Medical Research Council (MRC) Scale for Muscle strength.

Table 1: Cheshta Nivritti Grading

Parameter	Grading	Observation
<i>Cheshta Nivritti</i>	1	Normal
	2	Needs minor help
	3	Needs major help
	4	Complete loss of function

Table 2: Vakstambha Grading

Parameter	Grading	Observation
<i>Vakstambha</i>	1	Able to pronounce compound word
	2	Able to pronounce simple word but unable to pronounce compound words
	3	Slurred speech
	4	Aphasia

Table 3: Ruja Grading

Parameter	Grading	Observation
<i>Ruja</i>	1	No pain
	2	Mild pain occasionally
	3	Moderate tolerable pain
	4	Severe intolerable pain

RESULTS

34 patients were screened and enrolled in the clinical trial and 33 completed their course of treatment for 7 days and were assessed with before and after treatment. The socio demographic data of the patient's shows that average age of the patients enrolled in the

study was from 51 to 60 and among the gender male were 23 in number (Table 4)

Table 4: Demographic data of 34 patients of Pakshaghata

Age in Years	No. of Patients	Percentage
30-40	3	8.8
41-50	10	29.4
51-60	6	17.6
61-70	14	41.2

71-80	1	2.9
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The effectiveness of the drug imperatively evaluated with improvement in *Cheshta Nivritti*, *Vaaksthambha*, *Ruja* and NIH stroke scale, which showed improvement among the patients.

The primary outcome measure was assessed by *Cheshta Nivritti*, *Vaaksthambha* and *Ruja*. *Cheshta Nivritti* was improved in 19 patients, *Vakstambha* was improved in 13 patients and *Ruk* was improved in 18 patients. Statistically Wilcoxon signed rank test showed significant p value see table number 1: primary outcome measures.

Table 5: Wilcoxon Signed rank test showing the effect of *Mashasaptaka Kwatha* and *Mashasaptaka Taila* on primary outcome measures

Primary outcome measure	Negative ranks			Positive ranks			Ties	Total	Z	P	Remarks
	N	MR	SR	N	MR	SR					
<i>Chestanivrittii</i> AT-BT	19	10.0	190.0	0	.00	.00	14	33	-4.264	<0.05	S
<i>Vakstambha</i> AT-BT	13	7.00	91.00	0	.00	.00	20	33	-3.606	<0.05	S
<i>Ruja</i> AT-BT	18	9.50	171.0	0	.00	.00	15	33	-4.243	<0.05	S

MR = Mean Rank, SR = Sum of Ranks, S= Significant, NS = Non Significant

The secondary outcome measures was assessed by Wilcoxon signed rank test for muscle power of both upper and lower limbs statistically test showed significant value and there was improvement after the treatment. NIH stroke scale showed significant improvement in motor arm drift, motor leg drift and dysarthria see table number 3 NIH stroke scale.

Table 6 : NIH Stroke scale parameters

NIH stroke scale	Negative ranks			Positive ranks			Ties	Total	Z	P	Remarks
	N	MR	SM	N	MR	SM					
Facial Palsy AT-BT	14	7.5	105.0	0	.00	.00	19	33	-3.742	.000	S
Motor arm AT-BT	28	14.5	406.00	0	.00	.00	5	33	-4.88	.000	S
Motor leg AT-BT	29	15.0	435.00	0	.00	.00	4	33	-4.893	.000	S
Dysarthria AT-BT	12	6.50	78.00	0	.00	.00	21	33	-3.357	.001	S

MR = Mean Rank, SR = Sum of Ranks, S= Significant, NS = Non Significant

Table 7: Wilcoxon Signed rank test showing the effect of *Mashasaptaka* and *Mashasaptaka Taila* on Muscle power.

Muscle power	Negative ranks			Positive ranks			Tie s	Total	Z	P	Rem arks
	N	MR	SR	P	MR	SR					
UL-Proximal AT- BT	0	.00	.00	31	16.00	496.00	2	33	-4.936	.000	S
UL -Distal AT-BT	0	.00	.00	31	16.00	496.00	2	33	-4.936	.000	S
LL- Proxi mal AT- BT	0	.00	.00	31	16.00	496.00	2	33	-4.933	.000	S
LL- Distal AT- BT	0	.00	.00	31	16.00	496.00	2	33	-4.933	.000	S

MR = Mean Rank, SR = Sum of Ranks, S= Significant, NS = Non Significant

DISCUSSION

Statistically significant improvement was found in muscle strength and consequently motor arm, motor leg and *Cheshta nivrutti* after treatment. Wilcoxon signed rank test (P value>0.05) showed improvements in mean after treatment.

All the ingredients of the *Kwatha* are *Vatahara*. *Tila Taila* used as base oil for *Sneha Nasya* is best *Vatahara Sneha* and thereby improves the *Bala*. *Sneha* may have helped in nourishing the *Gritakaram Majja* as *Samanyo Vridhikaranam* thereby regaining motor function.

Cheshta Nivrutti is also a result of the *Shoshana* of *Sira* and *Snayu* by *Rukshateekshna Nidana Sevana*, *Dhatukshaya* etc. The *Ruksha Guna* of *Vata* may have been combated by the *Snigdha Guna* present in the ingredients of *Kwatha* as well as by the *Sneha*. *Ashwagandha*, *Bala*, *Masha*, *Kapikacchu* does *Vatanulomana* which helps in corrects the flow of *Vayu*. They also possess *Karma* like *Balya*, *Brimhana*, *Nadibalya*, *Dhatuvarhdhaka*, *Ojovardhaka* and *Rasayana* which would have improved the nourishment of the muscles leading to improved activity.

Motor activities of the body are attributed to the normal functioning *Vyana*. *Hridaya* is the seat of *Vyana Vayu*. *Katrina* and *Hingu* are *Hridya* and *Hridaya Srotoshodhaka* respectively aiding in removing any *Avarana* present and thereby facilitating unobstructed flow of *Vyana*.

Loss of functions of *Udana* such as maintenance of *Prayatna*, *Urja* and *Bala* as well as loss of function of *Vyana* like *Gati*, *Apakshepana*, *Utkshepa* presents as *Cheshta Nivrutti* in *Pakshaghata*. *Oushadha Sevana Kala* advised for *Vyana Vata* and *Udana Vata* is after food, morning and evening respectively. The medicine is administered in this *Kala*. This would have helped in improving the deranged *Vyana* and *Udana*.

The importance of *Hetu* and *Sthana* for the correct diagnosis and accordingly planning the treatment is mentioned in *Vatavyadhi*.

Targeting the *Sthana*: *Sthana* in case of *Pakshaghata* can be considered as *Shiromarma* and *Hetus* are multifaceted. *Shiras* is the *Sthana* of *Prana Vayu* which nourishes all the other types of *Vata*. As *Nasa is Shiraso Dwaram*, *Nasya* acted as the appropriate route of drug administration.

Research findings on ingredients w.r.t. enhancing locomotion: The results of a study showed that *Withania somnifera* has neuroprotective potential in both pre and post-stroke treatment paradigms in a mouse model of focal ischemia. In addition to the infarct volumes, WS also showed a definite trend in improving the locomotor activities of mice subjected to ischemia, which was an important finding vis-a-vis the functional recovery following stroke. *Rasna* contains chemical components such as pluchine, flavonoids, quercetin and isorhamnetin. Previous studies have revealed that Pluchine acts as CNS stimulant, has

neuroprotective and neuromodulatory action. Flavonoids have both antioxidant and antithrombotic property. Quercetin, attenuate severe neurological deficits and reduces infarct volume. Isorhamnetin improves blood brain barrier function. In a previous study, root extract has effect on locomotor activity and pentobarbital induced sleep, social isolation-induced aggressive behavior, motor coordination in the rotarod test.^[17]

Effect on *Vakstambha* and dysarthria

Statistically significant improvement was noticed in *Vakstambha* and dysarthria after treatment. Wilcoxon signed rank test (P value=.005) showed improvements in mean after treatment.

Vaksanga occur due to affliction of *Udana Vayu*. *Nasa* is one of the site of *Udana Vayu*. The *Nasya Karma* is indicated in *Vakgraha*, *Gadgadatva* etc. *Nasya* administered using *Mashasaptaka Taila* which have *Indriyabalakara* and *Tridoshahara* and *Vatakaphashamaka* properties respectively would have helped in improving speech.

In *Swarabheda Chikitsa*, *Vatakaphahara* line of treatment is mentioned. The cumulative effect of *Mashasaptaka Kashaya* is also *Vatakaphahara*.

Samana Avruta Prana causes *Gadgada* and *Mookatva*. *Rasna*, *Eranda*, *Kattruna*, *Hingu* and *Saindhava* have *Deepana*, *Pachana* and *Vatanulomana* effect which might have helped in removing the *Avarana*. *Kaphavruta Udana* causes *Vak Graha*. *Tila Taila*, *Hingu*, *Saindhava* are *Vyavayi*, *Vikasi* and *Teekshna*. By virtue of this, it acts as *Margavarana* and *Kapha Nisaraka* leading to the normal *Gati* of *Udana* and *Pranavata*. *Oushadha Sevana Kala* advised for *Udana Vata* that is evening after food was adopted in order to improve the function of *Udana*.

Effect on *Ruja*: Statistically significant improvement was noticed in *Ruk* after treatment. Wilcoxon signed rank test (P value=.000) showed improvements in mean after treatment. *Ruja* is caused by the *Laghu*, *Ruksha* and *Ashukari Guna* of *Vata Dosha*. *Masha*, *Bala*, *Rasna* and *Hingu* and *Saindhava* has *Shoolaprashamana* and *Vedanasthapana* properties by virtue of *Guru Snigdha* and *Ushna Guna*.

Effect on Facial Palsy: The deviation of angle of mouth and obliteration of naso labial fold is due to facial weakness on the affected side due to corrupted nerve supply. *Vaktrardhvakra* occur due to aggravation of *Chala Guna* of *Vata*, which is responsible for '*Anavasthitatva*'. *Mukhabhyanga* done with *Tila Taila* as *Purva karma* of *Nasya* is *Vvatahara* and *Dadyakara*. *Nasya* due to its therapeutic effect as well as pharmacological effect of *Mashasaptaka Taila* and oral intake of *Mashasaptaka Kwatha* helps to combat it by its *Shodhana*, *Snehana Balya*, *Brinhaniya*, *Nadibalya* and *Sthairyakara* properties.

Mode of action of drug: Most of the drugs in *Mashasaptaka Kwatha* are having *Snigdha*, *Guru Guna*, *Ushna Veerya*, and *Vata Shamaka* properties. All the above properties are very useful to alleviate the *Vata* which is aggravated by *Dhatukshaya*, *Vata Prakopaka Ahara & Vihar*, *Abhighata* etc. *Tikshna*, *Sukshma*, *Vyavayi Guna* and *Ushna Veerya* (Properties of drugs and *Til Taila*) remove the *Avarana* of *Vayu* and retain its normal *Gati*. *Balya*, *Brimhaniya* properties of drugs can nourish and increase the tone of *Dhatu*. *Ushna Veerya*, *Tikshna-Sukshma Guna* of *Taila* & Drugs which is administered by *Nasya Karma* (Target to site), remove the *Mamsadi Dushya Samurcchana* with *Dosha*. *Nasya* is directly affect the site i.e., *Murdha* where *Khavaigunya* takes place. ("*Nasa Hi Shiraso Dvarum*")

Mode of action of *Nasya*: *Nasa* being gateway to *Shirah*, the drug administered through nostrils reaches *Shringataka*, a *Siramarma* by *Nasa Srota* and spreads in the *Murdha* (~Brain), taking routes of *Netra* (Eyes), *Shrotas* (Ears), *Kantha* (Throat) and stretches the morbid *Doshas* from *Urdhwajatru* and expels them from *Uttamanga*. The nasal route of drug administration helps in by passing the hepatic first pass mechanism and drug degradation, leads to rapid drug absorption and quick onset of action. The blood brain barrier is highly permeable for lipid and lipid soluble substances. Therefore, these substances can pass easily through the blood brain barrier and can exert their actions. Certain lipids are used for providing energy to nervous tissues. *Nasya* acts at the level of blood circulation, lymphatic channel including CSF,

causes neuroendocrinal and neurovascular stimulation and also acts at neuropsychological levels

CONCLUSION

Mashasaptaka Kwatha with *Hingu* and *Saindhava* as *Anupana* and *Marsha Nasya* with *Mashasaptaka Taila* was found beneficial in subjects of *Pakshaghata*. It showed improvement in primary outcome measures such as *Cheshta Nivrutti*, *Vakstambha* and *Ruk* in subjects of *Pakshaghata* with p value < 0.05. In this study, maximum improvement was found in “*Cheshta Nivrutti*” followed by “*Ruk*” and then *Vak Stambha*”. It showed improvement in the NIH stroke scale parameters with p value < 0.05. No adverse drug reactions were reported during the study. Research hypothesis was thus accepted.

REFERENCES

- Acharya Y T. Sushruta Samhita with Nibandhasangraha commentary of Dalhanacharya. Sutra Sthana 33/3. Reprint ed. Varanasi (India): Chaukambha Sanskrit Sansthan; 2014. p. 144.
- Acharya YT. Charaka Samhita with Ayurveda Dipika commentary of Chakrapani Datta. Sutra Sthana 20/11. Reprint ed. Varanasi (India): Chaukambha Orientalia; 2014.p.113
- Acharya YT. Charaka Samhita with Ayurveda Dipika commentary of Chakrapani Datta. Chikitsa Sthana 28/43. Reprint ed. Varanasi (India): Chaukambha Orientalia; 2014.p.619
- Acharya YT. Charaka Samhita with Ayurveda Dipika commentary of Chakrapani Datta. Chikitsa Sthana 28/44. Reprint ed. Varanasi (India): Chaukambha Orientalia; 2014.p.619
- Acharya Madhavakara, Madhava nidanam with madhukosha Sanskrit commentary by Acharya Vijaya Rakshit and Shrikanta Datt, Edited by Dr.Ravidatt Tripady, 1st Volume 22th chapter, 1st Edition – 1993 published by Varanaseya Sanskrit Sansthan, Page no.505
- John maclod edited Devid sons principles and practice of medicine edited 2003, pub: pitman press, Great Britain. pp432 th
- Warlow CP, Dennis MS, VanGinJ J et al : A practical approach to management of stroke patients. In : Stroke: a practical guide to management. Blackwell sciences, London. 1996; 360-384
- Kasper, Dennis L., et al. Harrison's Principles of Internal Medicine. 2nd volume 17th chapter, 19th edition. New York: McGraw Hill Education, 2015. P.3068
- Prasad K, Vibha D, Meenakshi Cerebrovascular disease in South Asia - Part I: A burning problem. JRSMB Cardiovasc Dis. 2012; 1:20.
- Prasad K: Epidemiology of cerebrovascular disorders in India. In: Recent concepts in stroke by Bansal BC (ed) Indian college of Physicians, New Delhi. 1994;p4-192
- Colledge Nick R, Walker BrainR, Ralston StuartH. Davidson, Principle and practice of medicine. Reprint 2010, pub:pitman press, Great Britain. P.1184
- StrokefactsheetIndia.Accessed21July2013;http://www.sanecd.org/Updated%20Stroke%20Fact%20sheet%202012.pdf)
- Kasper, Dennis L., et al. Harrison's Principles of Internal Medicine. 2nd volume 17th chapter, 19th edition. New York: McGraw Hill Education, 2015. P.2560
- Acharya YT. Charaka Samhita with Ayurveda Dipika commentary of Chakrapani Datta. Chikitsa Sthana 28/100. Reprint ed. Varanasi (India): Chaukambha Orientalia; 2014.p.621.
- Acharya Y T. Sushruta Samhita with Nibandhasangraha commentary of Dalhanacharya. Chikitsa Sthana 5/19. Reprint ed. Varanasi (India): Chaukambha Sanskrit Sansthan; 2014. p. 427-428
- Tripathi, Jagadishwar prasad, Chakradutta of Tripathi Jagadishwar prasad, Vatavyadhi chikitsa:22,23, chaukhamba Sanskrit series office, Varanasi,1986,185
- A. Raghavan: Z. A. Shah; Springer Science+Business Media New York 2014; Withania somnifera Improves Ischemic Stroke Outcomes by Attenuating PARP1-AIFMediated Caspase-Independent Apoptosis

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