



International Journal of  
Ayurveda and Pharmaceutical  
Chemistry

[www.ijapc.com](http://www.ijapc.com)

# IJAPC

VOLUME 11 ISSUE 1 2019

E ISSN 2350-0204

GREENTREE GROUP  
PUBLISHERS



## Current Trend in the Management of *Pakshaghata* with Special Reference to Stroke

Ajay Kumar Tikoo<sup>1\*</sup> and Dustidev Sahu<sup>2</sup>

<sup>1</sup>Department of Panchkarma, Govt. Ayurvedic Medical College, Jammu, India

<sup>2</sup>Deptt. of Rognidan and VikrutiVigyan, Seth J.P. Govt. Ayurved College, Bhavnagar, GJ, India

### ABSTRACT

*Pakshaghata* or hemiplegia is a most crippling disease causing physical, mental and economic burden not only to the patient but also to whole family. The foremost cause of hemiplegia is stroke. Most of the death and disability in India are caused by Stroke. The incidence rate of stroke ranges 119-145/100,000 as per the population based studies conducted recently. Although the treatment available in Modern science is very effective in emergency management of acute stroke yet there is no effective post stroke management of disability produced by stroke. So global attention has shifted towards *Ayurveda* to get safe and cost-effective remedies for the management of *Pakshaghata* due to stroke in *Ayurveda*. *Snehana*, *Swedana*, *Mrudu Virechana*, *Basti*, *Sirovasti*, *Nasya* are the commonly used *Panchakarma* therapies in *Pakshaghata* due to stroke. The commonly used single drugs are *Withania somnifera*, *Nardostachys jatamansi*, *Bacopa monneri*, *Convolvulus pluricaulis* etc.

### KEYWORDS

*Stroke, Pakshaghata, Panchakarma, Vatavyadhi*



**Greentree Group Publishers**

Received 03/04/19 Accepted 20/06/19 Published 10/07/19



## INTRODUCTION

*Pakshaghata* is the loss of function of one side of the body. The most common cause of *Pakshaghata* is Stroke or Cerebrovascular accident. Stroke is evolving as a major cause of death and disability in India. The prevalence rate of stroke in rural area range, 84-262/100,000 whereas in urban area range, 334-424/100,000. The incidence rate of stroke is 119-145/100,000 based on the various latest population based studies<sup>1</sup>. The stroke is a very crippling disease affecting the Indian economy to a great extent. Stroke causes a great disability of patient causing physical, mental and economic burden for whole family<sup>2,3</sup>. Although the treatment available in Modern science is very effective in emergency management of acute stroke yet there is no effective post stroke management of disability produced by stroke. So global attention has shifted towards *Ayurveda* for its safe, effective and cost-effective management of *Pakshaghata* due to stroke. So it is the need of time to evaluate the commonly used *Ayurvedic* drugs regarding safety and efficacy which will strengthen the claim of *Ayurveda*. This review is carried out with aim of reviewing critically the action of commonly used stroke therapies in *Ayurveda* with respect to *Samprapti Vighatana*.

## AIMS AND OBJECTIVE

To review the action of commonly used stroke therapies in *Ayurveda* with respect to *Samprapti Vighatana*.

## MATERIALS AND METHODS

This study is carried out by searching various literatures and critically analyzing the obtained facts. The pathogenesis of Stroke and various studies on *Ayurvedic* stroke therapies were retrieved by going through various medical research databases like Pubmed, Google scholar, Embase and other national as well as international research databases. The terms entered for search were “Stroke”, “cerebro vascular accident”, “Stroke pathogenesis”, “*Pakshaghata*”, “*Pakshaghata* treatment” and “stroke physiology”, “physiology of cerebral circulation”, “stroke in *Ayurveda*”. Manual search was made by going through the reference list of retrieved articles to identify relevant additional study. The critical study of various *Ayurvedic* texts were carried out and an endeavor is made to comprehend the actions of *Ayurvedic* stroke therapy in relation to the *Samprapti Vighatana*.

## DISCUSSION

Stroke or Cerebrovascular accident is a clinical term in which there is a sudden



development of a neurologic deficit caused by abnormalities in the blood supplied to the brain. The blood flow to the brain is interrupted either by occlusion of an artery supplying to the brain which causes ischemic stroke or due to bleeding within the brain which causes the more deadly hemorrhagic stroke. The ischemic stroke is far more common than the hemorrhagic stroke. Ischemic stroke constitutes an estimated 85% of all stroke cases<sup>4</sup>. There are two types of ischemic stroke: thrombotic and embolic. Manifestation of thrombotic stroke occurs when a blood clot, called a thrombus, blocks an artery to the brain and stops blood flow. The cause of an embolic stroke is blocking of a downstream artery by a piece of plaque or thrombus which has travelled far from its original site of formation.

Hemorrhagic strokes are caused by hypertension, rupture of an aneurysm or vascular malformation. The complication of anticoagulation medications also leads to intra cerebral hemorrhage.

A stroke happens when there is lack of blood supply which results in the death of brain cells. The clinical manifestations of stroke depend on the type of pathology, the area of brain affected and severity of reduction in blood supply to the brain. The clinical manifestations may be transient ischemic attacks, sudden neurological

deficits like hemiplegia, facial weakness, loss of sensation, loss of coordination etc.

In *Ayurveda* the stroke manifestations may be included in disorders like *Mada*, *Murchha*, *Sanyasa*, *Pakshaghata* etc<sup>5</sup>. *Pakshaghata* is the loss of function of one side of the body<sup>6</sup>. It is the commonest manifestation of stroke.

In the pathogenesis of *Pakshaghata*, *Vata* is described as main *Dosha*. In addition, *Pitta* and *Kapha Dosha* are also associated in *Pittanubandhi* and *Kaphanubandhi Pakshaghata* respectively<sup>7</sup>.

#### **Role of Vata in the manifestation of stroke**

*Vata* is a prime *Dosha* among all *Dosha*<sup>8</sup>. It is responsible for all movement in the body. The main manifestation of stroke i.e. *Pakshaghata* is described as *Vatananatmaja vicar* in *Carak Samhita*<sup>9</sup>. Loss of function of one side of the body is main symptom in *Pakshaghata* which result from abnormality of *Chalaguna* of *Vata Dosha*.

#### **Role of Pitta in the manifestation of stroke**

In hemorrhagic stroke *Pitta* vitiation is important factor. When *Rasa* gets vitiated with *Pitta* then it becomes less coagulable and bleeds spontaneously causing cerebral hemorrhage and as a result of which stroke occurs. This leads to the manifestation of *Pakshaghata*. *Pitta* is also responsible for



excessive anger etc. which induces high blood pressure which is a risk factor for the manifestation of stroke.

### **Role of *Kapha* in the manifestation of stroke**

*Kapha* brings viscosity to the blood and due to the vitiation of *Kapha*, *Rakta* becomes hyper coagulable. This type of *Rakta* has more tendency to thrombosis and embolism which in turn is a cause for stroke. The inherent nature of *Kapha* is to cause obstruction which leads to impediment of blood supply to the brain leading to ischemia.

### **Role of *Meda* in the manifestation of stroke**

*Meda Dhatu* is nothing but the adipose tissue system within body. Hypercholesterolemia is a main risk factor for stroke which brings about thrombo-embolism. In the pathogenesis of *Sthoulya* also it is indicated that due to the obstruction of digestive fire by *Meda*, it makes the body susceptible for many severe *Vatic* disorder including *Pakshaghata*.

### **Role of *Rasavaha*, *Raktavaha* and *Samgyavaha Srotas* in the manifestation of stroke**

The main function of *Rasavaha Srotas* is to nourish all the body elements. Due to the abnormality of the *Rasa Dhatu* the brain may be deprived of the nutrients which lead to stroke. *Raktavaha Srotas* also help in

providing nutrients to the brain along with *Rasavaha Srotas*. Due to abnormality in *Raktavaha Srotas* embolism, hemorrhage etc. sets in leading to stroke and *Pakshaghata*. The brain is the seat of *Sangyavaha Srotas* which is responsible for sensory, motor functions and maintaining coordination of body. Due to the abnormality of *Sangyavaha Srotas* signs and symptoms related to sensory, motor and coordination function manifest.

### **Treatment of Stroke**

Stroke manifests mainly as *Pakshaghata* which is nothing but a *Vatavyadhi*. Being a *Vatavyadhi* it can be treated with general line of treatment for *Vatavyadhi*. As the *Samprapti Vighatana* is the main line of treatment of any disease same is applied to the *Pakshaghata* also. The line of treatment depends on the type of *Samprapti* involved with respect to *Suddhavata*, *Avrutavata*, *Anuvandha*, *Anuvandhya* etc. The general lines of treatment of *Pakshaghata* described in various classical texts are as follows:

*Acharya Caraka* mentions the treatment of *Pakshaghata* as *Swedanam Snehasamyuktam Pakshaghate Virechanam*<sup>10</sup>. *Acharya Jejjata* interprets this as *Snehayukta Swedan* and *Snehayukta Virechan*. *Acharya Sushruta* describes the specific line of treatment of *Pakshaghata* as follows: A patient of *Pakshaghata*, who is not emaciated, with painful affected part,



consistently follows the rules of diet and regimen and who have the ability to afford the cost of therapy should be taken for the treatment. Initially, *Snehan* and *Swedan* are to be conducted followed by *Mridu Vaman* and *Virechan*. This is to be followed by *Anuvasan* and *Asthapanbasti*. After this the general protocols and line of treatment depicted under the treatment of *Akshepaka* should be administered at proper time. *Mastishkaya*, *Shirobasti*, *Abhyanga* by *Anutaila*, *Salvana Upnaha Sweda* and *Anuvasan* by *Balataila* are the specific measures described. All these above mentioned measures should be followed carefully for a continuous period of three or four months<sup>11</sup>.

*Snehana* therapy – *Snehana* therapy is a prime treatment protocol for *Vatavyadhi*. In *Pakshaghata Abhyanga* is very useful as it modulates interneuron activity and improves selective voluntary motor control. *Snehan* cause increased blood circulation and increase the strength of muscle helping in recovery from stroke induced hemiplegia<sup>12</sup>.

The single herb drugs which are commonly used in treatment of stroke induced hemiplegia are as follows:

#### ***Ashwagandha* (*Withania somnifera*)**

Four major withanamides in *Withania somnifera* were found to cross blood-brain barrier and show preventive and therapeutic

effect in stress-induced neurological disorders<sup>13</sup>.

*Withania somnifera* increases antioxidant protection in aged spinal cord and inhibits copper induced lipid peroxidation and protein oxidative modifications<sup>14</sup>.

*W. somnifera* shows significant improvement in various oxidative stress markers of rodent brain<sup>15</sup>. This may indicate usefulness of *Ashwagandha* in oxidative stress related damage of brain tissue.

#### ***Jatamansi* (*Nardostachys jatamansi*)**

Seven major components were identified in *Valerianajatamansi* essential oil, namely,  $\beta$ -vatiorene,  $\beta$ -patchoulene, dehydroaromadendrene,  $\beta$ -gurjunene, patchoulic alcohol,  $\beta$ -guaiene, and  $\alpha$ -muurolene. The antioxidant activity of *Valerianajatamansi* roots is due the presence of significant amount of polyphenols and flavonoid content in its methanolic extract<sup>16</sup>.

*Nardostachys jatamansi* exerts Anti-neuro-inflammatory effect due the presence of Desoxo-narchinol A and Narchinol B in it<sup>17</sup>.

Study by Yoon et al. suggest that, five new and four known sesquiterpenoids were isolated from *Nardostachys jatamansi*, and compounds 3, 4, and 8 demonstrated anti-neuro-inflammatory effects in LPS-



stimulated BV2 microglial cells through inhibiting of NF- $\kappa$ B signaling pathway<sup>18</sup>.

The study conducted by Bose et al. shows *Nardostachys jatamansi* extracts shows significant anti-cholinesterases, anti-hyperglycemic anti-inflammatory, anti-hypertensive and anti-tyrosinase potential with higher yield of various bioactive metabolites and much higher antioxidant activity. These all activity plays a major role in breaking stroke pathogenesis<sup>19</sup>.

### ***Brahmi (Bacopa monneri)***

Study by Kwon et al. showed *Bacopa monneri* extract improves novel object recognition by increasing the cell proliferation and neuroblast differentiation in the dentate gyrus, and this may be closely related to elevated levels of BDNF and CREB phosphorylation in the dentate gyrus<sup>20</sup>.

Findings from study by Krishna et al. suggest that *Bacopa monneri* supplementation mitigates paraquat-induced behavioral deficits and brain oxidative stress in mice<sup>21</sup>.

Results from study by Le et al. showed that *Bacopa monneri* was beneficial for the prevention of cognitive deficits related to cerebral ischemia. In addition a molecule bacopaside I played a role in the neuroprotective effects of *Bacopa monneri* observed in the mouse model<sup>22</sup>.

### ***Shankhpushpi (Convolvulus pluricaulis)***

Study by Rachitha et al. shows *Convolvulus pluricaulis* extract contain many chemicals which have antioxidant potential, macromolecule damage and neuroprotective activity<sup>23</sup>.

The study by Malik et al. suggested that *Convolvulus pluricaulis* extract has a protective action against 3-NP-induced neurotoxicity<sup>24</sup>.

Study by Siddiqui suggest extracts of *Convolvulus pluricaulis* display neuro pharmacological activity in terms of locomotor activity, tremors activity, sleep inducing model and anxiolytic activity using standard procedures in experimental albino mice models<sup>25</sup>.

## **CONCLUSION**

The most common cause of *Pakshaghata* is stroke or cerebrovascular accident. The treatment of *Pakshaghata* mainly aims towards the alleviation of *Vata Dosha* with special attention to the *Avarana* of *Vata* by *Pitta*, *Kapha*, *Meda* and *Rakta*. The drugs acting on *Samgyavaha Srotas* and *Manovaha Srotas* are also commonly used to treat *Pakshaghata*. *Snehana*, *Swedana*, *Mrudu Virechana*, *Basti*, *Sirovasti*, *Nasya* are the commonly used Panchakarma therapy in *Pakshaghata*. The commonly used single drugs are *Withania somnifera*,



Nardostachys jatamansi, Bacopa monneri,  
Convolvulus pluricaulis etc.





## REFERENCES

1. Pandian JD, Sudhan P. Stroke Epidemiology and Stroke Care Services in India. *J Stroke*. 2013;15(3):128-134. doi:10.5853/jos.2013.15.3.128
2. Bhattacharjee M, Vairale J, Gawali K, Dalal P. Factors affecting burden on caregivers of stroke survivors: Population-based study in Mumbai (India). *Ann Indian Acad Neurol*. 2012; 15 (2):113-119.
3. Pandian JD, Srikanth V, Read SJ, Thrift AG. Poverty and Stroke in India: A Time to Act. *Stroke*. 2007;38(11):3063-3069. doi:10.1161/STROKEAHA.107.496869
4. Aunali S, Khaku, Hegazy M, Tadi P. *Cerebrovascular Disease (Stroke)*. Star Pearls Publishing; 2019.
5. Dr. Ram Karan Sharma and Vaidya Bhagwan Dash, *Caraka Samhita of Agnivesha Elaborated by Caraka and Drudhabala with the Ayurveda Dipika Commentry by Chakrapani Dutta (2002)*. Sutrasthana, Chapter-24, Verse No-25-27, Page-408. (Vol.1); Chowkhamba Sanskriti Series Office, Varanasi.
6. Dr. Ram Karan Sharma and Vaidya Bhagwan Dash, *Caraka Samhita of Agnivesha Elaborated by Caraka and Drudhabala with the Ayurveda Dipika Commentry by Chakrapani Dutta (2001)*. Chikitsasthana, Chapter-28, Verse No- 53-55, Page- 35. 2nd Ed. (Vol.5); Chowkhamba Sanskriti Series Office, Varanasi.
7. Kaviraaj Ambikadutta Shastri, *Susruta Samhita (2012)*. Nidan Sthan, Chapter- 1, Verse-63, Page 302. (Vol 1); Chaukambha Sanskrit Series Publication, Varanasi.
8. Dr. Ram Karan Sharma and Vaidya Bhagwan Dash, *Caraka Samhita of Agnivesha Elaborated by Caraka and Drudhabala with the Ayurveda Dipika Commentry by Chakrapani Dutta (2001)*. Chikitsasthana, Chapter-28, Verse No-3, Page-19. 2nd Ed. (Vol.5); Chowkhamba Sanskriti Series Office, Varanasi.
9. Dr. Ram Karan Sharma and Vaidya Bhagwan Dash, *Caraka Samhita of Agnivesha Elaborated by Caraka and Drudhabala with the Ayurveda Dipika Commentry by Chakrapani Dutta (2002)*. Sutrasthana, Chapter-20, Verse No-11, Page-363. (Vol.1); Chowkhamba Sanskriti Series Office, Varanasi.
10. Dr. Ram Karan Sharma and Vaidya Bhagwan Dash, *Caraka Samhita of Agnivesha Elaborated by Caraka and Drudhabala with the Ayurveda Dipika Commentry by Chakrapani Dutta (2001)*. Chikitsasthana, Chapter-28, Verse No-100, Page-51. 2nd Ed. (Vol.5); Chowkhamba Sanskriti Series Office, Varanasi.



11. Kaviraaj Ambikadutta Shastri, Susruta Samhita (2012). Chikitsa Sthan, Chapter- 5, Verse- 19, Page 42. (Vol 1) ; Chaukambha Sanskrit Series Publication, Varanasi.
12. Sankaran R, Kamath R, Nambiar V, Kumar A. A prospective study on the effects of Ayurvedic massage in post-stroke patients. *Journal of Ayurveda and Integrative Medicine*. December 2018. doi:10.1016/j.jaim.2018.02.137
13. Vareed SK, Bauer AK, Nair KM, Liu Y, Jayaprakasam B, Nair MG. Blood-brain barrier permeability of bioactive withanamides present in *Withania somnifera* fruit extract. *PhytotherRes*. 2014;28(8):1260-1264. doi:10.1002/ptr.5118
14. Gupta SK, Dua A, Vohra BPS. *Withania somnifera* (Ashwagandha) attenuates antioxidant defense in aged spinal cord and inhibits copper induced lipid peroxidation and protein oxidative modifications. *Drug Metabol Drug Interact*. 2003;19(3):211-222.
15. Durg S, Dhadde SB, Vandal R, Shivakumar BS, Charan CS. *Withania somnifera* (Ashwagandha) in neurobehavioural disorders induced by brain oxidative stress in rodents: a systematic review and meta-analysis. *J Pharm Pharmacol*. 2015;67(7):879-899. doi:10.1111/jphp.12398
16. Thusoo S, Gupta S, Sudan R, et al. Antioxidant activity of essential oil and extracts of *Valeriana jatamansi* roots. *Biomed Res Int*. 2014;2014:614187. doi:10.1155/2014/614187
17. Kim K-W, Yoon C-S, Kim Y-C, Oh H. Desoxo-narchinol A and Narchinol B Isolated from *Nardostachys jatamansi* Exert Anti-neuro inflammatory Effects by Up-regulating of Nuclear Transcription Factor Erythroid-2-Related Factor 2/Heme Oxygenase-1 Signaling. *Neurotox Res*. 2019;35(1):230-243. doi:10.1007/s12640-018-9951-x
18. Yoon C-S, Kim D-C, Park J-S, Kim K-W, Kim Y-C, Oh H. Isolation of Novel Sesquiterpenoids and Anti-neuroinflammatory Metabolites from *Nardostachys jatamansi*. *Molecules*. 2018;23(9). doi:10.3390/molecules23092367
19. Bose B, Tripathy D, Chatterjee A, Tandon P, Kumaria S. Secondary metabolite profiling, cytotoxicity, anti-inflammatory potential and in vitro inhibitory activities of *Nardostachys jatamansi* on key enzymes linked to hyperglycemia, hypertension and cognitive disorders. *Phytomedicine*. 2018;55:58-69. doi:10.1016/j.phymed.2018.08.010
20. Kwon HJ, Jung HY, Hahn KR, et al. *Bacopa monnieri* extract improves novel object recognition, cell proliferation,



neuroblast differentiation, brain-derived neurotrophic factor, and phosphorylation of cAMP response element-binding protein in the dentate gyrus. *Lab Anim Res.* 2018;34(4):239-247.

doi:10.5625/lar.2018.34.4.239

21. Krishna G, Hosamani R, Muralidhara null. Bacopa monnieri Supplements Offset Paraquat-Induced Behavioral Phenotype and Brain Oxidative Pathways In Mice. *Cent NervSystAgents Med Chem.* January 2019. doi:10.2174/187152491966619011512590

0

22. Le XT, Nguyet Pham HT, Van Nguyen T, et al. Protective effects of Bacopa monnieri on ischemia-induced cognitive deficits in mice: the possible contribution of bacopaside I and underlying mechanism. *J Ethnopharmacol.* 2015;164:37-45.

doi:10.1016/j.jep.2015.01.041

23. Rachitha P, Krupashree K, Jayashree GV, et al. Chemical composition, antioxidant potential, macromolecule damage and neuroprotective activity of *Convolvulus pluricaulis*. *J Tradit Complement Med.* 2018;8(4):483-496.

doi:10.1016/j.jtcme.2017.11.002

24. Malik J, Choudhary S, Kumar P. Protective effect of *Convolvulus pluricaulis* standardized extract and its fractions against 3-nitropropionic acid-induced

neurotoxicity in rats. *Pharm Biol.* 2015;53(10):1448-1457.

doi:10.3109/13880209.2014.984856

25. Siddiqui NA, Ahmad N, Musthaq N, Chattopadhyaya I, Kumria R, Gupta S. Neuropharmacological Profile of Extracts of Aerial Parts of *Convolvulus pluricaulis* Choisy in Mice Model. *Open Neurol J.* 2014;8:11-14.

doi:10.2174/1874205X01408010011