

## A CRITICAL APPRAISAL OF CEREBROVASCULAR ACCIDENTS (CVA) IN AYURVEDA

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### ABSTRACT

A cerebrovascular accident or stroke is defined as an acute focal neurological deficit resulting from cerebrovascular disease and lasting more than 24 hours (or causing earlier death). CVA is not a disease in itself but is a heterogeneous group of disorders. It is not a diagnosis, but a clinical syndrome with numerous causes. Cerebrovascular disease is any abnormality of the brain resulting from the pathology in blood vessels of the brain. There are various risk factors for CVA including hypertension, diabetes, hyperlipidemia, etc. According to WHO, CVA is the second major cause of death worldwide.

CVA is broadly classified based on its cause into ischemic and hemorrhagic. Both can present with a number of clinical presentations out of which hemiplegia is the most common one. Hemiplegia is the complete loss of function of one side of the body whereas hemiparesis denotes the partial loss of function. Ayurvedic textbooks explained *Pakshaghata* as having a similar symptomatic presentation as that of hemiplegia. Modern medicine plays a major role in the management of acute CVA whereas Ayurveda has the upper hand in treating the disabilities caused by CVA such as hemiplegia. This article comprises a review of references and understandings of cerebrovascular accidents and hemiplegia in Ayurveda.

**Keywords:** Cerebrovascular accident, Ayurveda, *Mastishka Marmabhighata*, *Pakshaghata*

## INTRODUCTION

The World Health Organization (WHO) defines CVA as “the rapidly developing clinical symptoms and/or signs of focal disturbance of cerebral function, with symptoms lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin.<sup>1</sup> CVA is not a disease in itself but is a heterogeneous group of disorders. It is not a diagnosis, but a clinical syndrome with numerous causes mainly; cerebral infarction, intracerebral hemorrhage, subarachnoid hemorrhage, cerebral venous thrombosis, etc.<sup>2</sup> These causes can be broadly termed cerebrovascular disease. Cerebrovascular disease is any abnormality of the brain resulting from the pathology in blood vessels of the brain. Pathologic processes can be occlusion of the lumen by embolus or thrombus, rupture of a vessel, altered permeability of the vessel wall, increased viscosity, or other changes in the quality of the blood flowing through the cerebral vessels.<sup>3</sup> Vascular pathology in the brain occurs due to various major and associated risk factors. Hypertension, diabetes mellitus, hyperlipidemia, cigarette smoking, alcohol, obesity, etc are the major risk factors for stroke. Previous stroke, raised haematocrit, high plasma fibrinogen, etc are the associated risk factors.<sup>4</sup>

CVA can present with various sensory and motor presentations. Hemiplegia is the most frequent and common clinical presentation of CVA. Weakness, speech disturbances, visual deficit, sensory loss, ataxia, etc are the clinical features of stroke.<sup>5</sup> Hemiplegia-like symptoms can be seen in other paralytic conditions like traumatic brain injury, multiple sclerosis, Takayasu arteritis, GB syndrome, myelomalacia, etc.

### Understanding CVA according to Ayurveda

Ayurvedic explains all neurological disorders under the heading of *Vatavyadhi*. *Pakshaghata* is one among the 80 *Vatavyadhis* which possess similarities to paralytic disorders. *Pakshaghata samprapti* explained by Charaka denotes the involvement of *Sira* and *Snayu*. *Prakupita vata* causes the *Shoshana* of

*Sira* and *Snayu* of one side of the body which in turn leads to clinical features like *Cheshta nivrutti* (loss of function), *Ruja* (pain), and *Vak stambha* (speech disturbances).<sup>6</sup> According to Sushruta, *Prakupita vata* resides in the *Dhamanis* of one side of the body and causes the *Akarmanyata* (loss of motor function) and *Achetana* (loss of sensory function) of the other side of the body.<sup>7</sup> This is similar to the contralateral manifestations in the case of CVA.

Staging of CVA can be done with the help of CT images as acute (less than 24 hours), subacute (24 hours to 5 days), and chronic (weeks). Similarly, the stages of *Pakshaghata* can also be explained.<sup>8</sup> Ayurvedic understanding of CVA can be explained in two stages; *Mastishka Marmabhighata* and *Pakshaghata*.

### Acute stroke v/s *Mastishka Marmabhighata*

Acute CVA is characterized by the rapid appearance (over minutes) of a focal deficit of brain function.<sup>9</sup> It can be mainly due to two types of vascular pathologies viz. cerebral ischemia and intracranial haemorrhage. Ischemic stroke accounts for 85% of all strokes and hemorrhagic stroke for 15%.<sup>10</sup> Acute stroke presents with symptoms like sudden onset of numbness or weakness in the face, arm, or leg, especially on one side of the body, sudden confusion, trouble in speaking or difficulty understanding speech, visual deficits, loss of balance, lack of coordination and sudden severe headache.<sup>11</sup>

*Mastishka Marmabhighata* is a condition explained by Charaka both in *Chikitsa sthana* and *Siddhi sthana*. In the *Trimarmiya siddhi* chapter, he explains the clinical features of *Abhighata* to *Mastishka marma* (brain). *Basti*, *hridaya* and *shiras* are considered to be the most important among *Marmas* as these are the seat of *Prana* and hence if injured can lead to severe complications or death.<sup>12</sup> *Prakupita vata dosha* is considered to be the most potent factor that causes *Marma abhighata* as *Vata* can further vitiate *Pitta* and *Kapha*. Hence Charaka gives importance to protecting the *Marmas* from *Vata dosha*.<sup>13</sup>

**Table 1:** Similarities in the clinical presentations of acute stroke and *Mastishka Marmabhighata*

Acute stroke <sup>14</sup>	<i>Mastishka marmabhighata</i> <sup>15</sup>
Facial paralysis	<i>Ardita</i>
Visual deficits, diplopia	<i>Chakshuvibhrama</i>
Altered consciousness	<i>Moha</i>
Headache	<i>Udveshtana (shirasi veshtanaakara vedana)</i>
Hemiparesis/hemiplegia	<i>Cheshtanasha</i>
Dysarthria/aphasia	<i>Muka-gadgada-swarahani</i>
Ptosis	<i>Akshinimilana</i>
Mouth angle deviation	<i>Vadana jihma</i>

*Shiromarma abhighata* is caused by prakupita vata. It can happen in two ways; dosha abhighata and bahya abhighata. Dosha abhighata are the intracranial pathologies and bahya abhighata is an external traumatic brain injury. Traumatic brain injury caused by blend injuries or road traffic accidents can also present with stroke-like symptoms and it can be considered as the bahya abhighata to Mastishka marma.

Vata prakopa occurs in two ways; marga avarana and dhatukshaya.<sup>16</sup> Avarana is caused by the santarpanajanya nidanas and abhishyandi aharas. This causes obstruction to the movement of vata leading to vata prakopa. Avarana janya Pakshaghata is correlated with ischemic stroke where the blood flow to the brain is obstructed due to blockage of the passage flow by embolism arising from atherosclerotic plaques in the aortic arch, or extracranial vessels or heart.<sup>17</sup> Sushruta mentions dhatukshaya janya Pakshaghata while explaining the prognosis of Pakshaghata. Dalhana explains dhatukshaya here as “*shonita atisrutikrita dhatukshaya* (dhatukshaya due to excessive bleeding)”. This is similar to hemorrhagic stroke. Dhatukshaya janya pakshaghata is asadhya according to Sushruta. Similarly, stroke mortality is higher in intracranial and subarachnoid hemorrhage which approaches 50% mortality by one month.<sup>18</sup>

#### **Hemiplegia v/s Pakshaghata**

Acute stroke can lead to death or disability. Survived patients can present with a wide range of disabilities. Hemiplegia is the most common clinical presentation of acute stroke, and it is the most common disability in stroke survivors. Motor deficits, sensory deficits, higher cerebral dysfunctions, trouble in speaking, cranial nerve symptoms, pain, etc can be observed in

the patients based on the area of the brain affected and the extension of the lesion. Weakness more severe in the face and arm also affects the leg. Speech dysfunction like aphasia or dysarthria, confusion, ataxia, etc can be seen in the patients. Complete sensory loss, paresthesia, numbness of the face or a limb are the other associated symptoms.<sup>19</sup>

Charaka explains *Cheshta nivrutti* (loss of movement), *Ruja* (pain), and *Vak stambha* (speech disturbances) as the *Pakshaghata lakshanas*. *Paksha ardha akarmanyata* and *Achetana* (loss of sensation) are the symptoms explained by Sushruta. *Cheshtanivrutti* denotes the motor deficit and *Achetana* refers to the sensory deficit in CVA. *Vichetana* is told by Vagbhata instead of *Achetana*. *Vichetana* is explained by Arunadatta as “*alpa chetana, ishat sparshadijnanavan ityarthaha*”. ie, mild to moderate loss of sensation.<sup>20</sup> Sensory function is given importance by Sushruta while explaining the prognosis and *Chikitsa* of *Pakshaghata*. Sushruta explains the selection criteria of *Pakshaghata* patients for treatment where he says that a *Pakshaghata* patient having pain as a symptom should be selected for the patient. Dalhana in commentary says *Pakshaghata* without pain is *Asadhya* (incurable).<sup>21</sup> *Achetana* (loss of tactile sensation) along with *Avedana* (loss of pain sensation) is said to be *Asadhya*. Hence the presence of *Ruja* (pain) is considered to be a good sign or an indicator of the sensory function.

#### **Prognosis of CVA**

Hemorrhagic stroke has an increased rate of initial mortality due to its progressive nature and the mass effect on the adjacent brain structures.<sup>22</sup> Ischemic strokes on the other hand have fewer chances of mortality as they have completed strokes most of the

time. According to sushruta if *Pakshaghata* is caused by *Shudha vata* (only *vata*dosha) then it is considered to be *Krichra sadhya* whereas *Anya dosha samsrishta vata* (*vata* along with other *doshas*) is considered to be *sadya*.<sup>23</sup> In *shudha vata avastha*, *vata* is the only *dosha* affected and it is the most potent. Hence it can worsen the condition fast. But in *Anya dosha samsrishta avastha*, *vata* is associated with either *Pitta* or *Kapha* or both. Hence the *Pitta* and *Kapha* can overpower *Vata* which makes it less potent. Since the power of *Vata* is less here, it does not cause severe symptoms. So, it can be managed well. *Dhatu kshayaja Pakshaghata* is said to be *Asadhya* (incurable) by Sushruta. Dalhana explains that *Dhatukshaya* is caused due to *Raktasrava* (hemorrhage). This is similar to the increased mortality of hemorrhagic stroke.

#### Conditions with *Pakshaghata*-like presentations

1. CVA
2. Multiple Sclerosis
3. Takayasu Arteritis
4. Autoimmune Encephalitis
5. Hypo/hyperkalemic Periodic Paralysis
6. G B Syndrome
7. Myelomalacia

## MANAGEMENT

The goal of acute stroke management is to stabilize the patient. In ischemic stroke, general therapy consists of respiratory and cardiac care, fluid and metabolic management, control of BP, prophylactic measures against DVT, aspiration pneumonia, and decubitus ulcer. Specific therapy is mainly intended for thrombolysis with rT-PA medicines. In intracranial hemorrhage, the main importance is given to maintaining the blood pressure within normal limits. Medical therapy is done with the blood clotting factors like rVII. Diuretics and surgical intervention are sometimes required to reduce intracranial pressure.<sup>24</sup> After the emergency management and once the patient is stabilized, rehabilitation therapies are done to correct the disabilities and to help the patient relearn skills lost or damaged by the stroke incidence. Based on the clinical presentations, *Mastishka Marm-*

*abhighata* is correlated with the acute stage of stroke and *Pakshaghata* is correlated with the hemiplegic stage. The same is applicable to the management also. Emergency care is required in the acute stage and rehabilitation therapies are advised for the later stages. Treatments advised for *Mastishka marmabhighata* are *Avapeeda nasya*, *dhuma nasya*, *snehana*, *abhyanga*, etc.<sup>25</sup> *Avapeeda nasya* is *teekshna nasya* mainly indicated for *Samjna prabodhana*; to improve the consciousness. According to Sushruta, *Pakshaghata chikitsa* should be treated initially by *Akshepaka chikitsa*.<sup>26</sup> *Akshepaka chikitsa* begins with *Teekshna nasya prayoga* for *Shiroshodhana*. After that, *Vatahara chikitsa* like *Snehana*, *Swedana* etc are advised.<sup>27</sup> *Shirovirechana* can be done with *Lashuna swarasa*, *guda-nagara*, *vacha churna pradhmana nasya* etc. This will help in clearing the *Srotases* of *Shiras* and will improve the consciousness in unconscious or subconscious patients. Once after the patient becomes stabilized and passes the stage of *Mastishka Marmabhighata*, he will be remained with the stage of disabilities ie, *Pakshaghata*. In this stage, *Pakshaghata chikitsa* and *Vatavyadhi chikitsa* are advised. *Snehana*, *swedana*, *mridu shodhana* are advised as the initial management in this stage.<sup>28</sup> *Bastikarma* (*anuvāsana* and *asthapana*) is the most important line of treatment in *Pakshaghata*. Other than this, *Shirobasti*, *abhyanga*, *navana nasya*, *upanaha sweda* etc are also indicated.

## CONCLUSION

Cerebrovascular accidents and the resultant hemiplegia can be understood in Ayurveda in terms of *Mastishka Marmabhighata* and *Pakshaghata*. Acute stroke is a stage of rapidly developing focal deficit of brain function. After the acute stage, the patient can present with disabilities which are known as the stage of hemiplegia. Similarly, according to ayurveda, *Mastishka Marmabhighata* is the acute stage, and its outcome is *Pakshaghata*. In both stages, the treatment varies. In the *Marmabhighata* stage, emergency managements like *Teekshna nasya* should be done for *Shira shodhana* and *Samjna prabodhana*. One the patient passes the acute stage, *Pakshaghata chikitsa*

can be adopted where intensive treatments are not required. In the modern era, acute stroke management is done by modern medicine as it requires emergency set ups. Ayurveda has the main role in the management of disabilities caused by stroke.

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