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An Ayurvedic approach in the management of Watershed Stroke - A Case Report

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ABSTRACT

Stroke is an acute onset of neurological dysfunction due to an abnormality in cerebral circulation with resultant signs and symptoms that correspond to involvement of focal areas of the brain and is commonly seen in elderly. However, the most common causes are thrombus, embolus and haemorrhage. Cerebraovascular Accident (CVA) is the third most common cause of death in high income countries after cancer and Ischemic Heart Disease (IHD), and the most common cause of severe physical disability.[2] Watershed stroke are a concern because they comprise approximately 10% of all ischemic stroke cases.[3] Among the stroke survivors, almost 50% will experience some disability. The main goals of therapy are to minimize brain damage and there by minimize neurologic deficit and disability and to improve the quality of life after the manifestation of stroke. Here is a case study of Watershed stroke, A 61 years old male patient presented with weakness of all four limbs and stiffness since 1 ½ years, associated with Slurred speech, which was treated under Ayurveda principles. As per Ayurvedic Classics, this condition can be paralleled with *Sarvanga Roga*. This is explained in the context of *Pakshaghata*. Loss of function of half of the body with or without facial involvement is called as *Pakshaghata* or *Ekanga Roga*. If the same affects both halves of the body i.e., all 4 limbs, is called as *Sarvanga Roga*. In this case, there is *Raktamarga Avarodha in Shiras* by *Kapha* resulting in *Vatavriddhi* and *Dhatukshaya*. So *Kaphahara* followed by *Vatahara, Bahirparimarjana Chikitsa* like *Sarvanga Dhanyamla Seka*, *Sarvanga Taila Seka* and *Sarvanga Shashtikashali Pinda Sweda* were adopted which does *Kaphahara, Vatahara* and *Brimhana* respectively. Along with these treatments *Kala Basti* and *Shamanaushadhis* were administered and has proved beneficial.

Key words: *Watershed stroke, Sarvanga Roga, Kala Basti, Shamanaushadhis.*

INTRODUCTION

Watershed stroke is defined as a brain ischemia that is localized to the vulnerable border zones between the tissues supplied by the anterior, posterior and middle cerebral arteries.[4] The actual blood stream blockage / restriction site can be located far away from the infarcts.[3] If low blood flow to watershed areas lasts for longer than a few minutes, the tissues in the watershed areas begin to die, causing a stroke. Clinical picture of watershed infarctions is often progressive or fluctuating; symptoms may be mild and are therefore probably underestimated.[5] Watershed strokes are localized to 2 primary regions of the brain and they are Cortical watersheds (CWS) and Internal Warersheds (IWS).[6] The resulting Symptoms differ based on the affected area of the brain. Watershed strokes symptoms are due to the reduced blood flow to brain, these leading to brain damage. Initial symptoms are Facial weakness (droop), Arm weakness (Drift), Speech difficulty (Slur)[7] etc. After the initial stroke, the symptoms depend on the area of the brain affected. Stroke presentation which are particularly suggestive of a watershed stroke include bilateral visual loss,

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stupor, weakness of the proximal limbs, sparing the face, hands and feet.

Early diagnosis and timely medical intervention can drastically reduce the severity of a stroke, limit damage to the brain, improve the chances of full recovery and reduce recovery times massively. Prognosis- Watershed strokes are seldom fatal, but they can lead to neuromuscular degeneration as well as dementia. This degeneration at the watershed regions of the brain can lead to difficulties with movement and motor coordination as well as speech, long term care is focused around three areas like Rehabilitative therapy, surgical intervention and prevention of further watershed strokes.

The aim of the treatment is to manage the disease without further worsening and to provide better quality of life to the patient.

CASE STUDY

A 60 years old male patient presented with weakness of all four limbs since 1 ½ years.

H/O Present Illness

1 ½ years back, suddenly he developed fever which was high grade, intermittent. After that he developed rashes all over the body associated with weakness in right and left UL and left LL. During its treatment he developed drug reactions in the form of maculopapular rashes all over the body. He was diagnosed to have Steven Johnson's syndrome and started treatment accordingly. Then the weakness progressed to right LL. No H/O loss of Consciousness/ Urinary/Stool incontinence. Later he was treated in ICU.

He was diagnosed as Suffering from Acute Ischemic stroke – Bilateral MCA and ACA Watershed territory, Severe Steven Johnson's syndrome.

Later weakness of both Upper and Lower limb increased gradually with facial deviation towards left associated with Stiffness and restricted movements of limbs and slurred speech. For further management of the condition patient got admitted to our hospital.

Patient is K/C/O DM since 4 years on medication.

H/O Past Illness

History of Steven Johnson's syndrome 4 years back.

H/O Tracheostomy surgery on 12/8/19 and PEG tube insertion.

N/C/K/O/ HTN, No H/O trauma, No H/O loss of consciousness, No chest pain, palpitations etc.

Treatment History

1. Tab Clopilet A 150mg (0-1-0)
2. Cap Pantocid DSR 40mg (0-1-0)
3. Tab Avas 20mg (0-1-0)
4. Tab Glimestar M2 (1-0-0)

Family History - Not specific

Personal History

Diet - Veg, Appetite - Decreased, Bowel - Constipation, Micturition - 7 to 8 times per day, Sleep - Sound.

Physical Examination

Built - Moderately built,

Pallor, Ictrus, Cyanosis, Lymphadenopathy and Oedema - Absent.

Ashtasthana Pareeksha

- *Nadi* - 78 beats/min
- *Mala* - once in two days
- *Mutra* - 7-8 times per day/once in night
- *Jiwha - Aliptha*
- *Shabdha - Prakrutha.*
- *Sparsha - Prakrutha.*
- *Drik - Prakrutha.*
- *Arkruthi - Madhyama*

Dashavidha Pariksha

- *Prakriti: Kapha* and *Vata*
- *Satwa, Samhanana, Sara, Saatmya - Madhyama*
- *Pramana - Madhyama*
- *Vyayaama Shakti - Madhyama*

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- *Aahara Shakti - Madhyama*
- *Vayas* - 60years

Systemic Examination

Respiratory system: B/L NVBS heard

Cardiovascular system: S1 S2 heard.

Gastro-intestinal system: Per Abdomen – Soft, non-tender and bowel sounds heard.

Central Nervous System

A] Higher Mental Functions

- Conscious and Co-operative
- Oriented to time, Place and Person
- Memory - Intact
- Speech - Slurred speech.

B] Cranial Nerve Examinations

Facial nerves (7th)

- Forehead frowning : Normal
- Eyebrow raising : Normal
- Eye closure : Normal
- Teeth showing : Normal
- Blowing of cheek : Reduced puffing in right side
- Nasolabial fold : Absent

Spinal accessory nerve (11th)

- Shrugging of shoulder- Diminished in both sides

Rest of cranial nerves - Normal.

C] Motor System

		Right	Left
1. Attitude of limb	Upper limb	Adducted and Flexed elbow, wrist and digits	Normal
	Lower limb	Normal	Extended
2. Muscle tone	Upper limb	Rigidity	Rigidity
	Lower limb	Rigidity	Rigidity
3. Muscle Power	Upper limb	1/5	2/5
	Lower limb	3/5	2/5
4. Muscle bulk	Upper limbs	Normal	
	Lower limbs	Normal	

5. Tropical changes - No bed sores.
6. Atrophy and Hypertrophy - Absent
7. Fasciculation & Irritability - Absent
8. Coordination -

Upper Limb - a) Finger to nose test - Can't be Elicited

Lower Limb – a) Heal to knee test - Can't be Elicited

9. Involuntary Movement - Absent
10. Gait and Posture: Instability while walking with a fear of fall (unable to walk without support)
11. Reflexes:

Superficial reflexes -

- Corneal and Abdominal Reflex - Normal
- Plantar - Babinski's Sign - Positive both Lower limbs.
- Deep tendon reflexes

Reflexes	Right	Left
Bicep's jerk	Exaggerated	Exaggerated
Triceps jerk	Exaggerated	Exaggerated
Knee jerk	Exaggerated	Exaggerated
Ankle jerk	Exaggerated	Exaggerated
Clonus	Absent	Absent

- Visceral reflexes (micturition & bowel) - Intact

D] Sensory System

- Superficial : Touch, Temperature, pain sense- Intact
- Deep pain perception : Intact
- Vibration Sense : Intact

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- One point localization, Two point discrimination : Intact
- Graphesthesia & Stereognosis : Intact

Investigation

Routine studies of blood and urine were within normal limits.

MRI - Brain with spine screening without contrast

1. Multifocal infarcts involving left MCA, superficial and deep watershed territory.
2. Multifocal and multiphasic infarcts involving right fronto-parietal region – distal ACA/ MCA watershed territory.
3. Suggested Vascular imaging.

Doppler Carotids (Duplex)

- Intimal thickening in bilateral common carotid arteries and internal carotid artery.
- Large segment free floating thrombus in the left common carotid artery extending into left external carotid artery causing 90% luminal narrowing.
- Suggest CT angio

CT Scan Neck Angiography

- Long segment thrombus involving distal segment of left CCA extending upto bifurcation.
- Occlusion of A3 segment of bilateral ACAs.

MRI Brain – T2 Diffusion

Temporal evolution of the infarcts involving bilateral distal ACA territories and left MCA posterior watershed territory.

Intervention

Table 1: Showing the treatment.

SN	Treatment	1st sitting	2nd sitting
1.	*Sarvanga Dhanyamla Seka*	First - 7 days	First - 7 days
2.	*Sarvanga Taila Seka* with *Mahamasha Taila* + *Dhanwantara Taila.*	8th to 14th day	8th to 14th day
3.	*Sarvanga Shashtikashali Pinda Sweda*	15th to 21th day	15th to 21th day
4.	*Shirodhara with Ksheerabala taila*	First 10 days	First 10 days
5.	*Thalam* with *Rasanadi Churna* + lemon	First 10 days	First 10 days
6.	*Kala Basti* *Anuvasana Basti* with *Mahanarayana Taila* (70ml) *Niruha Basti* – *Madhu* - 70ml *Saindhava Lavana* - 6 gms *Mahamasha Taila* - 70ml *Dhanwantara Taila* - 70ml *Kalka* - 25 gm *Mustadi Yapana Ksheera Kashaya* - 350ml	9 days 6 days	9 days 6 days

Table 2: Showing the *Shamana Aushadhi*

SN	*Shamanaushadi*	Dose	*Anupana*	1st sitting	2nd sitting
1.	*Gandharvahastadi Eranda Taila*	0-0-10ml Night before food	With equal quantity of *Ushna Ksheera*	For 3 days	For 3 days
2.	*Ashtvarga Kashaya + Danadanayanadi Kashaya*	20ml-0-20ml (10ml each) After food	*Sukoshna Jala*	21 days	21 days
3.	*Tablet Ekangaveerarasa*	(1-1-1) After food	*Sukoshna Jala*	21 days	21 days

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4.	*Balamoola Ksheera Kashaya*	(0-50ml-0) After food	*Sukosh na Jala*	21 days	21 days

Table 3: Showing the *Shamana Aushadhis* at the time of discharge

SN	***Shamana Aushadi***	**Dose**	***Anupana***	**1st sitting**	**2nd sitting**
1.	Cap *Dhanwantara* 101	(2-0-2) After food	*Sukosh na Jala*	1month	1 month
2.	*Mashathmagupthadi Kashayam + Hingu + Saindhava*	(50ml-0-50ml) After food	*Sukosh na Jala*	1month	1month
3.	*Ekanga Veera Rasa*	(1-0-1) After food	*Sukosh na Jala*	1month	1month
4.	*Tab Shivagutika*	(1-0-0) After food	*Sukosh na Jala*	1month	1month

Observation and Result

- There was no much change for a week at the beginning of the treatment. Later after 1 week patient could able to stand with support, later muscle power was improved in the upper limbs and rigidity got reduced a little in the lower limbs. By the end first sitting patient's muscle power improved and patient could able to sit and stand with 2 person's support.
- After 5 months he was admitted again for the 2nd sitting of treatment. The same treatment protocol was followed during 2nd sitting and even *Shamana Aushadis*. Gradually by the end of the 2nd sitting of treatment patients muscle power got improved and rigidity reduced and the patient could able to sit and stand without support and walk with support. There was significant reduction in signs and symptoms.

Discussion

In *Ayurveda*, this type of quadriplegia can be paralled with *Sarvanga Roga*. This is explained in the context of *Pakshaghata*. Loss of function of half of the body with or without facial involvement is called as *Pakshaghata* or *Ekanga Roga*. The same on both halves of the body is called as *Sarvanga Roga.*[8] As per *Acharya Sushruta, Akarmanyata* as *Ishatkarmakshayamam* – partial loss of function, whereas commentator *Dalhana* interprets *Achetana* as *Alpachetana*, referring to partial loss of sensation.[9] In this case there is *Raktamarga Avarodha* in *Shiras* by *Kapha* resulting in *Vatavriddhi* and *Dhatukshaya*. So *Upastabhitha Vata Chikitsa* was followed.

Initially patient was treated with *Shirodhara with Ksheerabala Taila*[10] and *Sarvanga Dhanyamla Seka.*[12] *Shirodhara* is a type of *Mastiskya*, helps in *Vakmanasthiryakara* (Increases stability in speech and mind) *Shareerabalasthiryakara* (increases strength), *Ksheerabala Taila* is mainly indicated in *Vata Vyadhis* acts as *Vatashamana, Brimhana* and *Jeevana*.

Thalam with *Rasanadi Churna* + lemon is *Klamhara*, and imparts strength to sight, *Rasanadi Churna* contains *Rasna, Aswagandha, Devadaru, Katuki, Sarjarasa, Kushta, Vacha, Kanyarasa, Gairika, Yastimadhu, Balamoola, Musta, Sunti, Maricha, Pippali, Useera, Agaru* etc. and it acts as *Vatakaphahara.*[11]

To start with *Rukshana Karma* is very much essential in this case to remove *Stabdatha* and highly beneficial in stroke due to ischemia or infarction. Hence it was done with *Dhanyamla Seka* which is *Vatakaphahara*, *Deha Sthariyakara, Sroto-Vishodhanam Amapachaka* and *Pusthikara.*

Sarvanga Taila Seka with *Mahamasha Taila*[13] and *Dhanwantara Taila,*[14] which act as *Vatashamaka*. *Mahamasha Taila*, which is *Ushna, Guru, Balya, Brihmana* and *Vatashamana*. *Dhanwantara Taila* are *Madhura, Sheeta, Guru, Balya* and *Brihmana* in action. In *Sarvanga Shashtika Shali Pinda Sweda, Shashtika Shali* processed in *Balamoola Ksheera Kashaya* is *Snigdha* and *Brimhana* acts as *Vatahara* and helps in improving the muscle power and reduces rigidity.

For *Kosthashodhana*, *Gandharvahastadieranda Taila*[15] was given with *Ksheera* orally before food for 3 days, which is one of the best *Vatalomana* and

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Vatakaphahara, it does the *Srotovishodana,* and *Adhobhagadoshahara*.

Mustadi Yapana Basti[16] in the pattern of *Kala Basti* administered as patient's built was good. *Mustadi Yapana Basti* is having both *Lekhana* and *Brimhana* action simultaneously. It nourishes the *Rasadi Dhatu*. The ingredients of *Mustadi Yapana Basti* have predominant *Vatahara, Deepana, Sadhyobalajana* and *Rasayana* properties. Drugs used in preparation of *Mustadi Yapana Basti* especially attributed with property of *"Mamsa-Balajanan"* (increase muscle power). Drugs like *Ksheera, Ghrita, Bala, Haritaki, Yasthimadhu* etc. drugs have properties of *Balya, Snigdha, Jivaniya, Guru,* and *Madhur Rasa* and *Vipak, Sheeta Virya*. These properties will reduce *Dourbalya* as well as others symptoms due to vitiated *Vata*.

Anuvasana Basti was given with *Mahanarayana Taila,*[17] which is *Madhura, Sheeta, Guru, Balya, Brihmana* and its main ingredients is *Shatavari*. As it is *Vatapitta Shamaka* it is highly beneficial in *Dhatukshayajanya Vatavyadhi* i.e., degenerative neurological disorders. The *Sneha Dravyas* used in *Niruha Basti* were *Mahamasha Taila,*[13] which is *Ushna, Guru, Balya, Brihmana and Vatashamana*. It contains *Masha* & *Dashamoola* as major ingredients. It is highly useful in muscular weakness. *Dhanwantara Taila* is *Madhura, Sheeta, Guru, Balya, Brihmana*.

Astavargha Kashaya[18] is *Katu Tikta Rasa, Ushna Veerya, Vata Kapha Hara*. It is also called as *Balasahacharadi Kashaya* because it contains *Bala, Sahachara, Eranda, Shunti* etc. drugs. *Danadanayanadi Kashaya*[19] is *Tikta Katu, Ushna Veerya* and *Kaphanubhandha Vata Hara*. Its main ingredient is *Danadanayana (Kuberaksha Mula), Shunti, Shigru, Rasana, Pippali* etc. Both *Kashayas* are used in *Avarana* & *Vatakaphaja* conditions.

Ekangaveera Rasa[20] possesses *Teekshna* and *Ushna Guna, Ushna Veerya, Vatakaphahara, Dhatupustikara, Deepana, Balya, Rasayana* because it contains *Shuddha Gandhaka, Mruta Soota, Lauha Bhasma, Abhra Bhasma, Vanga Bhasma, Tamra Bhsama, Nagara, Maricha, Pippali, Nirgundi* etc. *Ekangaveera Rasa* is indicated in *Vata* and *Vatakapha* predominant neurological conditions.

Balamoola Ksheera Kashaya[21] was given for nourishment as explained by *Acharya Susrutha.*

At the time of discharge patient was administered with *Dhanawanatara* 101 capsule, which is *Brimhana*. *Mashathmagupthadi Kashayam*[22] was given along with *Hingu* and *Saindhava* as *Prakshepaka Dravya*, it contains *Masha, Athmaguptha, Eranda, Bala* and specially indicated in *Pakshaghata*.

Shivagutika tablet contains *Shilajatu, triphala* etc. which is *Srotoshodhaka, Vatakaphahara, Rasayana* in action.

Along with above treatment, to mobilize the limbs and to improve gait, Physiotherapy like gait training, balancing exercise, strengthening exercise and coordination exercise for upper & lower limbs were advised.

These *Panchakarma* therapies and *Shamana Aushadis* has given Significant improvement by reducing the signs and symptoms. By the end of the treatment, patient was able to stand without support and walk with support.

CONCLUSION

Watershed infarcts occur at the junction between the two non-anastomosing distal arterial distributions in the brain. Classically it presents with weakness of proximal arm and legs muscles and preservation of distal strength. This can be paralleled with *Sarvanga Roga* as there is *Karmakshaya* of all four limbs. Early diagnosis and timely medical intervention can drastically reduce the severity of a stroke, limit damage to the brain and improve the chances of a full recovery. Through *Avarana Chikitsa* followed by *Kevala Vata Chikitsa, Sarvangavata* i.e., Watershed stroke can be effectively managed by *Panchakarma* and *Shamaushadhis*.

REFERENCES

1. E.C.Warner, Savill's System of Clinical Medicine, 14th edition 2005, CBS Publishers and Distributors Chapter 19 P -1183,Pp-1496

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2. Brian R. Walker, Davidson's Principles and Practice of Medicine, 22rd ed. 2014 Churchill livingstone Elsevier Publishers Chapter 27 P- 1234 PP-1372
3. Torvik, A. (1984). "The pathogenesis of watershed infarcts in the brain". *Stroke*. 15 (2): 221–3. doi:10.1161/01.STR.15.2.221. PMID 6701929.
4. Porth, C.M. (2009). *Pathophysiology: Concepts of Altered Health States (Eighth Edition)*. Philadelphia: Wolters Kluwer Health | Lippincott Williams & Wilkins. p. 1301. ISBN 978-16054-7390-1.
5. Momjian-Mayor I, Baron JC. The Pathophysiology of Watershed Infarction in Internal Carotid Artery Disease (Review of cerebral Perfusion Studies). Stroke 2005;36:567-77.
6. Momjian-Mayor, I; Baron, J.C. (2005). "The Pathophysiology of Watershed Infarction in Internal Carotid Artery Disease: Review of Cerebral Perfusion Studies". *Stroke*. 36 (3): 567–77.
7. Harbison, J.; Massey, A.; Barnett, L.; Hodge, D.; Ford, G. A. (1999). "Rapid ambulance protocol for acute stroke". *The Lancet*. 353 (9168): 1935. doi:10.1016/S0140-6736(99)00966-6. PMID 10371574.
8. Acharya YT; ed; Agnivesa. Caraka Samhita with Ayurveda Dipika commentary of Chakrapanidatta. 2013 ed. Varanasi: Chaukhambha Prakashana: Chikitsasthana: Chapter 28, sloka:55, P-619,Pp-738
9. Acharya Vaidys Jadvji Trikamji, Acharya Narayan Ram; Susruta Samhita with Nibandhasangraha commentary of Dalhanacharya and Nyayachandrika Panjika of Gayadasacharya; 2012 ed; Varanasi; Chaukhamba Sanskrit Sansthan; Nidana Sthana; Chapter 1,Sloka – 62, P-266, Pp- 824s
10. Rao Dr G Prabhakar; Sahasrayogam:2019 ed: New Delhi, Chaukhambha Publications: Taila Prakarana, P-559, Pp-838
11. Rao Dr G Prabhakar; Sahasrayogam:2019 ed: New Delhi, Chaukhambha Publications: Lepa yoga Prakarana, P-338, Pp- 838
12. Rao Dr G Prabhakar; Sahasrayogam:2019 ed: New Delhi, Chaukhambha Publications: Arista yoga Prakarana, P-712, Pp- 838
13. Shri Govinda Dasji. *BhaisajyaRatnavali Vol 2*, 2017 ed. Varanasi: Chaukhambha Sanskrit Sansthan; Chapter26, P- 228, Pp-799
14. Rao Dr G Prabhakar; Sahasrayogam:2019 ed: New Delhi, Chaukhambha Publications: Taila Prakarana, P-496, Pp-838
15. Sharma Dr.Shivprasad, Astangasamgraha with shashilekha Sanskrit commentary by Indu: 2012 ed: Varanasi, Chaukambha Sanskrit Series: Chikitsasthana chapter 15, shloka 25, P-521, Pp- 965
16. Acharya YT; ed; Agnivesa. Caraka Samhita with Ayurveda Dipika commentary of Chakrapanidatta. 2013 ed. Varanasi: Chaukhambha Prakashana: Siddhisthana: Chapter 12, sloka:15, P-731,Pp-738
17. Shri Govinda Dasji. *BhaisajyaRatnavali Vol 2*, 2017 ed. Varanasi: Chaukhambha Sanskrit Sansthan; Chapter26, P- 188, Pp-799
18. Sharma Ramnivas, Sharma Surendra;Sahasrayoga Mula; 2016 ed. New Delhi, Chaukambha Sanskrit Pratisthan: Kashaya Prakarana, P-29, Pp- 318
19. Rao Dr G Prabhakar; Sahasrayogam:2019 ed: New Delhi, Chaukhambha Publications: Kashaya Prakarana, P-91, Pp- 838
20. Reddy Dr Rama Chandra. Aushadha Yoga Vijnanam; 2011 ed. Varanasi; Chaukambha Sanskrit Bhawan; P-24, Pp - 456
21. Acharya Vaidys Jadvji Trikamji, Acharya Narayan Ram; Susruta Samhita with Nibandhasangraha commentary of Dalhanacharya and Nyayachandrika Panjika of Gayadasacharya; 2015ed; Varanasi; Chaukhamba Sanskrit Sansthan; Chikitsa Sthana; Chapter 27,Sloka – 10, P-499, Pp- 824s

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