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## Ayurveda Management of Syringomyelia - A Single Case Study

Patient presented with dysphagia, regurgitation, vertigo, repeated spitting, one sided weakness with numbness and mild pain and hearing loss. MRI showed a syrinx extending from cervico-medullary junction to D12 and CSF flow study showed Backward flow with low mean velocity. She diagnosed case of Arnold Chiari malformation syringohydromyelia Type 1. Patient was diagnosed as *kaphaavritapranavayu* along with *shiomarmaabhighata* and treated with *panchkarma* therapies and shamans medications primality for 5 months then follow up for every 3 month. Significant improvement was found in both classical symptoms as well as in MRI, CSF flow study and x-rays reports.

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## Ayurveda Management of Syringomyelia – A single Case Study

Ankita Agarwal\*, Asit Kumar Panja

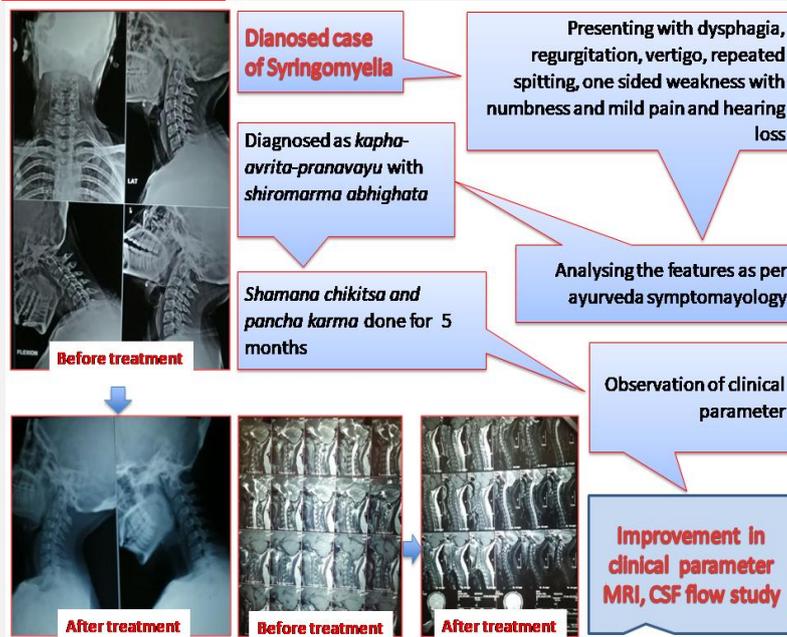
Department of Basic Principles, National Institute of Ayurveda, madhav Vilas Palace, Amer Road, Jaipur, Rajasthan 302002, India.

### ABSTRACT

**Background:** Syringomyelia is a disorder in which a fluid filled cyst forms within the spinal cord and causes a wide variety of neuropathic symptoms. No permanent cure has been found yet in modern science to treat this disease. However different *Panchkarma* therapies along with oral drugs mentioned in Ayurveda texts have been found to be effective in this disease. In present case report a patient diagnosed with Arnold Chiari malformation syringohydromyelia Type 1 was treated with Ayurveda modalities. According to Ayurveda patient was diagnosed as *kapha-avrita-pranavayu* along with *shiomarmaabhighata*. **Method:** A 26years old female patient with the symptoms of dysphagia, regurgitation of food through nose, vertigo, repeated spitting thick sputum, weakness of right upper and lower limb associated with numbness and mild pain and hearing loss was given Ayurveda treatment. The features were assessed on the basis of classical signs and symptoms mentioned in Ayurveda. *Panchakarma* therapies such as *karna-purana*, *shiropicchu* etc. along with oral medications according to the line of treatment of above mentioned Ayurveda diagnosis were administered for 5 months. Improvement was assessed on the basis of relief in patients's symptoms along with MRI reports and CSF flow study. Follow up was taken to evaluate the sustainability of the result. **Result:** Significant improvement was found in both classical signs and symptoms as well as in MRI and CSF flow study. There were significant relief in all mentioned complaints of patient apart from hearing loss. Size of syrinx reduced markedly in size in current MRI report and CSF flow study. **Conclusion:** Present case study shows that the symptoms of syringomyelia can be successfully treated in accordance with the principles of Ayurveda.

**KEYWORDS** Ayurveda, *kaphaavritaprana*, syringiomyelia

### PICTORIAL ABSTRACT



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**CORRESPONDENCE** Dr. Ankita Agarwal, PG Scholar, Department of Basic Principles, National Institute of Ayurveda, Madhav Vilas Palace, Amer Road, Jaipur, Rajasthan 302002, India. Email: chinuagarwal5@gmail.com

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### 1. INTRODUCTION

Syringomyelia refers to a disorder in which a fluid filled cyst called as 'syrinx' develops within the spinal cord. This syrinx may damage to the spinal cord and as a result of this damage patient experiences severe pain, abnormal sensations and other neurological symptoms.<sup>[1]</sup> Syringomyelia can be categorized broadly in three forms namely congenital brain defects, injury of the spinal cord and idiopathic syringomyelia.<sup>[2]</sup> The most common form of syringomyelia is found associated with congenital brain abnormalities.<sup>[3]</sup> Chiari malformation type 1 falls in this first category. Type 1 occurs when the lower part of the cerebellum (called the cerebellar tonsils) gets displaced downwardly through the foramen magnum and may form a syrinx which causes pressure on the spinal cord.<sup>[4]</sup> Chiari

malformation type 1 is associated with group of symptoms such as neck pain, unsteady gait (problems with balance), poor hand coordination (fine motor skills), numbness and tingling of the hands and feet, dizziness, difficulty swallowing, sometimes accompanied by gagging, choking and vomiting. Vision problems (blurred or double vision), speech problems such as hoarseness occur usually in the late childhood or adulthood. According to the reports, prevalence of syringomyelia is about 8.4 cases per 100,000 people.<sup>[5]</sup> However, till now there is no permanent cure of this disease. Some surgical procedures such as duroplasty, shunt placement etc. are adopted to restore the normal CSF flow and reduce the pressure on spinal cord. These procedures carry the risk of spinal cord injury and may not be effective in all. Hence, there is a need to understand this disease

through the wisdom of other clinical sciences for finding out safer treatment. A patient diagnosed as Chiari malformation - I syringomyelia was treated with Ayurveda modalities. Patient's symptoms were interpreted with the classical symptoms of *kapha-avrita-prana-vayu* along with *shiro-marma-abhigata*.<sup>[6,7]</sup> A case is being presented which was treated as per the treatment principle of *avarana-chikitsa* and *shiro-marma-abhigatachikitsa*.

## 2. CASE REPORT

A 26 year old female patient diagnosed as 'arnold chiari malformation syringohydromyelia type 1' came to OPD, Dept of Basic Principles, National Institute of Ayurveda, Jaipur. She presented with the symptoms like dysphagia, regurgitation of food through nose, occasional voice change, vertigo, repeated spitting of thick sputum (more than 25 to 30 times in a day), hearing loss, weakness in right upper and lower limb associated with numbness and mild pain. In addition to that she also

complained of pain in the neck and face region. Ayurvedic treatment was started on 23/08/2018 after explaining the prognosis clearly. Past sequences of presentation and chronology of the manifestations are given in Table 1.

### 2.1 Therapeutic focus and assessment

In this case, *shiropichu*, *karnpurana* with *dhanwantarm* oil were given as patient was showing the symptoms of *shiro-marma-abhigata*. The procedures mentioned in *shiro-marma-abhigatachikitsa* were continued up to 5 months. *Dhanwantarm* oil<sup>[14]</sup> has *vata* mitigating property and does not vitiate *kapha* due to its *anabhishtanditva*. After that, *nasya* with *karpasthyadi* oil for *srotoshodhana* and *abyanga* with *dhanwantarm* oil for *vatanashana* were included in previous mentioned procedures. Apart from procedures, oral medicines such as *nimba-amritadieranda* oil<sup>[15]</sup> for *mridu-virechana*, *dashmoola* decoction,<sup>[16]</sup> *shilajatu*<sup>[17]</sup> etc were started.

**Table 1. Timeline of the case**

Time and date	Clinical events and intervention
2010	Developed partial loss of hearing in left ear in 2010 which was established 2012.
2012	Multiple episodes of vomiting on excessive crying and laughing.
2017	Developed left side hearing loss, episodic vomiting, difficulties in swallowing and regurgitation of liquid through nose, occasional voice change, vertigo and weakness of all four limbs.
18-05-2017 to 15.6.17	<ul style="list-style-type: none"> <li>➤ MRI of Brain with GD dated 18.05.2017 revealed herniation of bilateral cerebellar tonsils seen in foramen magnum having peg like appearance s/o Arnold chiari 1 malformation and syrinx was seen in cervical cord. She was advised to do complete study of CVJ and cervical spine.</li> <li>➤ MRI study of CVJ dated 24.5.17 depicted severe compression of cervico-medullary junction S/o chiari 1 malformation and syrinx was seen in C2-D8 level.</li> <li>➤ Dynamic CT scan of cervical spine dated 15.6.17 was suggestive of complete atlanto occipital assimilation.</li> </ul>
11.7.17	<ul style="list-style-type: none"> <li>➤ Admitted in modern hospital with the aforesaid complaints on 11.7.17 and underwent 'foramen magnum decompression with C1 laminectomy with lax duroplasty' on 28.7.17.</li> <li>➤ The operation was successful and was discharged with Tab augmantin 625 mg TDS, Tab gabapin 400 mg, Tab baclofen, Tab signoflam 1 mg BD etc.</li> </ul>
August 2017	<ul style="list-style-type: none"> <li>➤ Got mild relief in pain after the duroplasty whereas the other symptoms persisted.</li> <li>➤ Gradually she developed the complaint of repeated spitting of thick sputum more than 25 to 30 times in a day.</li> </ul>
Nov 2017	<ul style="list-style-type: none"> <li>➤ The symptoms further aggravated and MRI of CVJ and cervical spine done on dated 28.11.17 revealed increased size of syrinx extending from cervico-medullary junction to D12 s/o syringohydromyelia.</li> <li>➤ CSF flow study at foramen magnum dated 14.08.2018 revealed the following : stroke volume - 0.002; Forward flow volume - 0.029; backward flow volume - 0.027; mean velocity - 0.053 cm/ sec.</li> </ul>
3.4.18 to 17.4.18	<ul style="list-style-type: none"> <li>➤ Admitted again from 3.4.18 to 17.4.18 in the modern hospital with same symptoms complexes for further surgery but was not done.</li> <li>➤ She was discharged with Tab Thiopace 4 mg BD, Tab Clozio 6.5 mg, Tab Pantop 40 mg OD.</li> </ul>

At this stage, patient approached for Ayurvedic treatment in order to avoid surgery and to reduce the fluid content in the syrxn.

## 2.2 Ayurvedic diagnosis

The presentation and Ayurveda assessment are given in Table 2.

**Table 2. Features as per Ayurveda**

Presentation	Feature as per Ayurveda
Difficulty in swallowing and regurgitation of food through nose	<i>Annaadanakarmavikriti, vikrata pranavayukarma</i> <sup>[8]</sup>
Repeated spitting of thick sputum	<i>Ati-sthivana</i> <sup>[9]</sup>
Hearing loss in left side of ear	<i>Shrutihan</i> <sup>[10]</sup>
Feeling weakness in right upper and right lower limbs	<i>Hasta-padachesthani</i> <sup>[11]</sup>
Pain in right upper and right lower limb	<i>Hasta- padaruja</i> <sup>[12]</sup>
Numbness of limbs	<i>Hasta-padasuptata</i> <sup>[10]</sup>
Pain in the neck region and face	<i>Gandaruka</i> <sup>[12]</sup>
Impairment of one half the body (the face along with half of the body) associated with pain, discomfort and improper motor and sensory functions	<i>Ardita</i> <sup>[11]</sup>
Change in voice	<i>Gadgadtavam</i> <sup>[11]</sup>
Vertigo	<i>Bhrama</i> <sup>[11]</sup>
Loss of appetite	<i>Aruchi</i> <sup>[13]</sup>

**Table 3. Treatment given**

Date	Treatment given	Details of treatment given	Dose	Anupana and sevana kala	Duration
23.8.18	Shamanchikitsa	Nimbaamritadi oil	5 ml OD	Warm milk, nishakala	28 days
		Musta Paniya	6 g in 2 l reduced to 1.5 l	Whole day	28 days
	Food	Proyagikatarpana	25 g	With honey mix in 100 ml water - during breakfast	28 days
	Panchkarma				
	Abyanga	Dhanwantaram oil - whole body massage	As required	Prate kala, ananna	28 days
	Karnapura	Karpassthyadi oil	2 drops	Prate kala, ananna	28 days
20.09.18	Panchkarma				
	Abyanga	Dhanwantarm oil - whole body massage	As required	Prate kala, ananna	14 days
	Pratimarsha Nasya	Karpassthyadi oil	2 drops	Prate kala, ananna	14 days
	Shiropicchu	Kaspassthyadi oil	As required	Prate kala, ananna	14 days
	Lepa (over neck and affected area up to the level of syngx)	Kolakulathadilepa	As required	Butter milk	14 days
	Shamanachikitsa	Nimbaamritadi oil	5 ml OD	Warm milk, nishakala	14 days
		Musta Paniya	6 g in 2 l reduced to 1.5 l	Whole day	14 days
	Food	Proyagikatarpana	25 g	With honey & 100 ml water - during breakfast	14 days
04.10.18	Panchkarma	Same as before			28 days
	Shamanachikitsa				
		Haritaki powder	5 g BD	Jaggery, ananna kala	28 days

		Dashmool decoction (12 g yavakuta = boiled in 400 ml water reduced to 200 ml)	100 ml BD	In empty stomach	28 days
	<b>Food</b>	Proyagikatarpana	25 g	With honey and 100 ml water - during breakfast	28 days
<b>01.11.18</b>	<b>Panchkarma</b>	Same as before			45 days
	<b>Shamanachikitsa</b>				45 days
		Haritaki powder	5 g BD	Jaggery, ananna kala	45 days
		Dashmool decoction (12 g yavakuta = boiled in 400 ml water reduced to 200 ml)	100ml BD	In empty stomach	45 days
	<b>Food</b>	Proyagikatarpana	25 g	With honey and 100 ml water - during breakfast	45 days
<b>20.12.18</b>	<b>Panchkarma</b>	Same as before			14 days
	<b>Shamanachikitsa</b>	<i>Kshirbala</i> oil (101 avarti)	10 drops	Milk, after breakfast	14 days
		Shudhashilajatu	250 mg	Milk in morning	14 days
<b>03.01.18</b>	<b>Panchkarma</b>	Same as before			14 days
	<b>Shamanachikitsa</b>	Shudhashilajatu	250 mg	Milk in morning	14 days
		Haritaki powder	5 g BD	Jaggery, ananna kala	14 days
		Dashmool decoction (12 g yavakuta= boiled in 400 ml water reduced to 200 ml)	100 ml BD	In empty stomach	14 days
<b>Follow up treatment</b>					
<b>17.1.19</b>	<b>Panchkarma</b>				
	Abyanga	Dhanwantarm oil - for whole body massage	As required	Prate kala, ananna kala	90 days
	Karnapura	Karpassthyadi oil	2 drops	Prate kala, ananna kala	14 days
	<b>Shamanachikitsa</b>	<i>Kshirbala</i> oil (101 avarti)	10 drops	Milk, after breakfast	90 days
		Shudhashilajatu	250 mg	Milk in morning	90 days
<b>14.4.19</b>	<b>Panchkarma</b>				
	Abyanga	Dhanwantarm oil - for whole body massage		Prate kala, ananna kala	90 days
	PratimarshaNasya	Karpassthyadi oil	2 drops	Prate kala, ananna kala	14days
	Shamanachikitsa	<i>Kshirbala</i> oil (101 avarti)	10 drops	Milk, after breakfast	90 days
		<i>Dashmoolksirapaka</i> (6 g yavakuta = boiled in 100 ml water plus 100 ml milk = reduced to milk i.e. 100 ml)	100ml BD; every time prepared fresh	In empty stomach	90 days
<b>25.7.19</b>	<b>Panchkarma</b>				
	Abyanga	Dhanwantarm oil - for whole body massage		Prate kala, ananna kala	90 days
	Shamanachikitsa	<i>Kshirbala</i> oil (101 avarti)	10 drops	Milk, after breakfast	90 days
		<i>Dashmoolksirapaka</i> (6 g yavakuta = boiled in 100 ml water plus 100 ml milk = reduced to milk i.e. 100 ml)	100 ml BD; every time prepared fresh	In empty stomach	90 days

Patient was not on allopathic medication during this treatment period. For assessment, symptoms of *kaphaavritapranavayu* along with *shiro-marmaabhogata* and MRI reports were used.

### 2.3 Follow up and outcome

A significant improvement was noted in this case in both classical signs and symptoms as well as in MRI. There were improvement in symptoms such as *bhrama* (vertigo), *suptata*, *daurbalya* and *ruja* in *dakhniahasta* and *pada* (weakness, numbness, pain in right upper and lower limb),

*annaadanakarmavikrati* (regurgitation of food), *gadgadtavam* (change in voice), *aruchi* (loss of appetite) and *gandaruka* (pain in neck). However, there was no significant relief in *shrutihani* (hearing loss). Notable improvement was noticed in MRI reports which has been presented as mentioned in Table 4.

**Table 4. Comparative chart of improvement after treatment**

	Before treatment	After treatment (dated 06.01.2019)	Follow up (22.07.19)
MRI cervical spine	Increased size of syrinx extending from cervico-medullary junction to D12 s/o syringohydromyelia (dated 28.11.17)	Hyper intense signal intensity is seen within the cord extending from C2 to D6 level suggestive of syrinx	Evidence of central CSF signal intensity is seen in the visualised cervico-dorsal cord from C1 level suggestive of syrinx
CSF flow study at foramen magnum	Stroke volume - 0.002; Forward flow volume - 0.029; Backward flow volume - 0.027; Mean velocity- 0.053 cm/sec. (dated 14.08.18)	CSF flow velocity is normal at the foramen magnum in the systolic and diastolic phase	Not done as patient was normal

Follow up was taken to evaluate the sustainability of the result

### 3. DISCUSSION

*Pranavayu* resides in brain and moves in chest and throat. It regulates the functions related to heart, intellect, and sense organs such as expectoration, sneezing, and belching inspiration and swallowing of food.<sup>[8]</sup> However when it gets vitiated by other *dosha* or obstructed (*avrita*) by *kaphadosha* it cannot execute its action properly and also shows adventitious symptoms such as vomiting, nausea, loss of appetite.<sup>[6]</sup> Untreated condition leads to further vitiation of *pranavayu* which affects its residing place brain (*shira*)<sup>[7]</sup> and causes symptoms mentioned in *shiomarmaabhigata* like *ardita*, vertigo (*bhrama*), hearing loss, *daurbalya*, etc.<sup>[11]</sup>

In this case, patient started with complain of nausea, vomiting, hearing loss, regurgitation of food through nose, which reflect the symptoms of vitiated *pranavayu*. However, in due course of time, these symptoms got aggravated and some other symptoms mentioned in *shiomarmaabhigata* started to appear such as *ardita*, *bhramam*, *daurbalya*. For restoring the proper flow and functions of *pranavayu*, it is necessary to remove the obstruction of *kapha*. It is done by the treatment principle of *avaranchikitsa* along with *shiomarmaabhigatachikitsa*. According to *Avaranchikitsa*, the treatment modalities having *anabhishtyanadi* but *snigdha*, cleansing properties (to clean the passage of the *srotas*) and *mriduvirechan*, *rasayana*, *shilajatu* should be used.<sup>[17]</sup> As per the treatment principle of *shiomarmaabhigata*, *abyanga*, *svedana*, *nasya* and *vasti* should be done.<sup>[18]</sup> Hence, in this case barring

*vasti*, both *avarnachikitsa* and *shiro-marmaabhigatachikitsa* mentioned above have been adopted.

At present, patient is under observation and on oral treatment and no complications are noted during follow up. Also, there is no worsening of previous complaints of patient which encourages for further treatment planning and research in this disease through Ayurveda prospective.

#### 3.1 Probable brief mode of action of treatment

*Dhanwantaram* oil is used for *abyanga*. It contains mainly *dashamula* which mitigates *vata* without aggravating *kapha* due to its *anabhishtyanadi* property. *Karpasasthyadi thailam*, mentioned in *arditachikitsa*, is used for *karnapurana*, *nasya* and *shiro-pichu*. *Karpasasthyadi* oil contains mainly *karpasa*, *balamoola* and *kulatha* which has *srotoshodhana* property but also neutralizes *vata*.

Initially *mustapaniya* is given for *pachana* and *srotoshodhana* which helps in removing the *avarana* of *kapha*. *Nimbaamritadieranda* oil is given for *vata-anulomana* as it contains *eranda* oil and *guggulu*. It helps in restoring the fellow of *prana-vayu*. Subsequently *gudaharitaki* is given as *mriduvirechana*. *Dashamula* decoction is given for *vata-nashana*. *Rasayanchikitsa* is adopted as patient is having symptoms of *marmaabhigata*. *Shilajatu* mentioned in *avaranchikitsa* is used in later phase as it removes the *avarana* and act as a *rasayana*.

In food, *prayogikatarpana* is used which contains mainly *yava* powder, *pachaniyadravya* and is having *laghu* property. It removes *avarana* to some extent.

#### 4. CONCLUSION

The above mentioned case study shows that the symptoms of syringomyelia can be successfully treated in accordance with the basic principles of Ayurveda. This study can support in further research of the treatment of syringomyelia with the help of Ayurveda principles.

**PATIENT CONSENT** The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given consent for clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**CONTRIBUTORS** Ankita Agarwal did the literature survey, data acquisition from various sources and design. Panja Asit K contributed to conceptualization of the topic, intellectual content and manuscript editing. The clinical study has been conducted by Ankita Agarwal and Panja Asit K.

#### References

1. <http://en.m.wikipedia.org> Accessed on 09.08.2019
2. <https://www.betterhealth.vic.gov.au/health/ConditionsAndTreatments/syringomyelia> Accessed on 09.08.2019
3. <https://www.betterhealth.vic.gov.au/health/ConditionsAndTreatments/syringomyelia> Accessed on 09.08.2019
4. <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Chiari-Malformation-Fact-Sheet> Accessed on 09.08.2019
5. <http://emedicine.medscape.com>article> Accessed on 09.08.2019
6. Acharya Jadavji Trikamji (Editor), Revised Edition. Charaka Samhita by Agnivesh with Commentary by Chakrapanidatta, Chikitsasthan Chapter 28, verse 222; Varanasi: Chaukhambha Surbharati Prakashan, 2011: p.626.
7. Acharya Jadavji Trikamji (Editor), Revised edition. Charaka Samhita by Agnivesh with Commentary by Chakrapanidatta: Sidhisthan Chapter 9, verse 4; Varanasi: Chaukhambha Surbharati Prakashan, 2011: p.716.
8. Bhisagacharya Harishashtri Paradkar (Editor), Reprint edition. Ashtanga Hridayam by Vagbhata with commentaries Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri: Sutrasthana Chapter 12, verse 4-5; Varanasi: Krishnadas Academy, 2000: p.193.
9. Bhisagacharya Harishashtri Paradkar (Editor), Reprint edition. Ashtanga Hridayam by Vagbhata with commentaries Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri: Nidanasthana Chapter 16, verse 20; Varanasi: Krishnadas Academy, 2000: p.530.
10. Bhisagacharya Harishashtri Paradkar Vaidya (Editor), Reprint edition. Ashtanga Hridayam by Vagbhata with commentaries Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri: Nidanasthana Chapter 15, verse 35; Varanasi: Krishnadas Academy, 2000: p.533.
11. Acharya Jadavji Trikamji (Editor), Revised Edition. Charaka Samhita by Agnivesh with Commentary by Chakrapanidatta: Sidhisthan Chapter 9, verse 6; Varanasi: Chaukhambha Surbharati Prakashan, 2011: p.618.
12. Acharya Jadavji Trikamji (Editor), Revised Edition. Charaka Samhita by Agnivesh with commentary by Chakrapanidatta: Chikitsasthan, Chapter 28, verse 42; Varanasi: Chaukhambha Surbharati Prakashan, 2011: p.618.
13. Acharya Jadavji Trikamji (Editor), Revised Edition. Charaka Samhita by Agnivesh with commentary by Chakrapanidatta: Chikitsasthan, Chapter 28, verse 223, Varanasi: Chaukhambha Surbharati Prakashan, 2011: p.626.
14. Bhisagacharya Harishashtri Paradkar (Editor), Reprint edition. Ashtanga Hridayam by Vagbhata with commentaries Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri: Sharirasthana Chapter 2, verse 52; Varanasi: Krishnadas Academy, 2000: p.383.
15. Bhisagacharya Harishashtri Paradkar Vaidya (Editor), Reprint edition. Ashtanga Hridayam by Vagbhata with commentaries Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri: Chikitsasthan, Chapter 21, verse 58-61; Varanasi: Krishnadas Academy, 2000: p.726.
16. Bhisagacharya Harishashtri Paradkar (Editor), Reprint edition. Ashtanga Hridayam by Vagbhata with commentaries Sarvangasundara of Arundatta and Ayurvedarasayana of Hemadri: Sutrasthana, Chapter 6, verse 167-168; Varanasi: Krishnadas Academy, 2000: p.120.
17. Acharya Jadavji Trikamji (Editor), Revised Edition. Charaka Samhita by Agnivesh with Commentary by Chakrapanidatta: Chikitsasthan, Chapter 28, verse 239; Varanasi: Chaukhambha Surbharati Prakashan, 2011: p.627.
18. Acharya Jadavji Trikamji (Editor), Revised Edition. Charaka Samhita by Agnivesh with Commentary by Chakrapanidatta: Sidhisthan, Chapter 9, verse 8; Varanasi: Chaukhambha Surbharati Prakashan, 2011: p.718.