ISSN: 2322 - 0902 (P) ISSN: 2322 - 0910 (O)



# International Journal of Ayurveda and Pharma Research

# Case Study

# ROLE OF AGNI KARMA AND SNEHAPANA IN MANAGEMENT OF PAIN IN CERVICAL SPONDYLOSIS: A CASE STUDY

#### Charde VA<sup>1\*</sup>, Amit<sup>1</sup>, Nair PG<sup>1</sup>, Deep VC<sup>2</sup>

\*1Research officer (AYU) <sup>2</sup>Research officer (SCT-3), Central Ayurveda Research Institute for Neuromuscular & Musculo-Skeletal Disorders (CARINMSD), CCRAS, Cheruthuruthy, Kerala, India.

# ABSTRACT

**Introduction**: Cervical spondylosis (*Greevasthamba*) is a degenerative condition with pain in cervical region as a major symptom. In modern science condition is usually treated with analgesic, corticosteroids, surgical decompression, traction etc. which not contribute much promising results. But in Ayurveda several methods like *Snehana, Upanaha, Agnikarma, Raktamokshana* and *Panchakarma* etc. are specified in management of pain. **Case presentation**: A male patient aged 42 years admitted CARIN-MSD, IPD with pain in the neck region since 2 months, which was also radiating to the right upper limb along with numbness up to the tip of fingers. Cervical active range of motions were painful during flexion, extension and lateral rotation. Spurling test and lhermitte's sign were positive. Along with the support of X- ray and MRI investigations the patient was diagnosed with cervical spondylosis due to chronic postural strain. **Management and Outcome**:Patient was treated with *Agnikarma* and *Snehapana*, the pain score over visual analogue scale and NPQ percentage before *treatment* was **Nine and 87.5** % respectively while after intervention it was reduced to **Two and 33.33** % within seven days. **Conclusion**: In acute painful stage of cervical spondylosis *Agnikarma* and *Snehapana* can play a major role in management of pain.

KEYWORDS: Agnikarma, Cervical spondylosis, Greevasthambha, Snehapana, Visual analogue score.

#### **INTRODUCTION**

Cervical spondylosis is a degenerative condition<sup>[1]</sup> of cervical spine which is correlated with *Greevasthambha* in Ayurveda.<sup>[2,3,4]</sup> Pathology starts at the intervertebral disc with degeneration of disc resulting in the compression of cervical nerve along with space reduction. It leads to pain<sup>[5]</sup>, stiffness in neck, pain radiate into shoulders, forearm, headache, vertigo, paresthesia at the base of the thumb etc.<sup>[6]</sup> In modern medical science the role of analgesic corticosteroids, surgical decompression, traction has been credited and discredited mainly because of their drawbacks and limited uses.

In Ayurveda such degenerative conditions come under Vataja disorders which can be either due to Avarana (Vata being covered by Kapha or other Doshas) or Dhatukshaya. Several treatments like Snehana, Upanaha, Agnikarma,<sup>[7]</sup> Raktamokshana and Panchakarma etc. are advised for such Vatik conditions with pain as a major symptom. Among these Agni karma due to its Ushna, Suksham and Ashukari Guna pacifies the Vata Kaphadosha and remove Srotoavrodha. Sneha due to its Guru, Snigdha and Ushna Guna pacifies the provoked Vata.

#### **Case report**

## **Presenting complaints**

A male patient aged 42 years visited OPD in CARIN- MSD, Cheruthuruthy with following complaints:

- Pain over the neck region since 2 months radiating to the right upper limb along with numbness up to the tip of fingers.
- Difficulty in neck movements and also in raising right hand

#### History of Present complaints

Patient experienced pain over the hands a month before, after taking heavy load over his head. By occupation the patient is a tapping worker and has to do a lot of work by using his hands, more pain was felt while doing work.

#### Past illness

- There was no history of hypertension, diabetes mellitus, tuberculosis and any other serious illness.
- No relevant hereditary, congenital and surgical illness were found.

#### **Personal history**

General condition of patient was moderate; appetite of the patient was normal. Bowel habit and micturition was normal. Sleep was disturbed due to pain.

Patient was admitted in I.P.D of CARIN-MSD, Cheruthuruthy for further clinical assessments and Investigations.

## **Clinical findings**

Patient was conscious and oriented. Blood pressure was normal other vitals were stable. Cranial nerve examinations were normal. Cervical active ranges of motion were painful during flexion, extension and lateral rotation. By Cervical compression of the neck increased the pain and radiates pain towards patient's arms (spurling test positive).<sup>[8]</sup> During flexion of neck patient feel electric shock towards arms (Lhermitte's sign).<sup>[9]</sup> Patient was of *VataKapha* body constitution with predominance of *Vatadosha*, involving *Asthimajja* as a *Dushya*.

**Investigations:** X- Ray cervical spine shows mild osteophyte formation with normal intervertebral disc. MRI image of cervical spine shows right posterolateral disc prolapse at C6/C7 causing moderate C7 root compression. Diffuse annular bulges at C3/C4 and C4/C5 causing

minimal thecal sac compression. Routine blood investigations were in normal limits. Urine routine examination showed to be normal but calcium oxalate crystals were observed in microscopic examination. Cholesterol levels were on slightly higher. The patient was diagnosed with cervical spondylosis due to chronic postural strain.



#### **Treatment planned**

- 1. *Agnikarma* at the cervical region
- 2. Snehapana with Prasanyadi Taila

#### Criteria for assessment

Intensity of Pain was assessed by visual analogue score from 0-10 before and after *Agni karma* and *Snehapana*. The Northwick Park neck pain questionnair <sup>[10]</sup> was adopted. Interpretation was done by NPQ percentage. Where NPQ PERCENTAGE = (NECK PAIN SCORE)/32\* 100. **VAS Score** 

# 1. No pain

- 2. Hardly notice pain
- 3. Notice pain, does not interferes with activities
- 4. Pain sometime distracts me
- 5. Distracts me, can do usual activities
- 6. Interrupts some activities
- 7. Hard to ignore, avoid usual activities
- 8. Focus of attention, prevents doing daily activities
- 9. Awful, hard to do any activity
- 10. Cannot bear the pain, unable to do anything
- 11. As bad as it possible, nothing else matters.

I have no pain at the moment 0	
The pain is mild at the moment 1	
The pain is moderate at the moment 2	
The pain is severe at the moment 3	
The pain is the worst imaginable at the 4	
moment	
Neck pain and sleeping	
My sleep is never disturbed by pain 0	
My sleep is occasionally disturbed by pain 1	
My sleep is regularly disturbed by pain 2	
Because of pain I have less than 5 hours sleep 3	
in total	
Because of pain I have less than 2 hours of 4	
sleep in total	

Pins and needles or numbness in the arms at	nigh
I have no pins and needles or numbness at	0
night	
I have occasional pins and needles or	1
numbness at night	
My <mark>sleep</mark> is regularly disturbed by pins and	2
nee <mark>dle</mark> s or numbness	
Because of pins and needles I have less than 5	3
hours sleep in total	
Because of pins and needles or numbness I	4
have less than 2 hours of sleep in total	
Duration of symptoms	
My neck and arms feel normal all day	0
I have symptoms in my neck or arms on	1
waking which last less than 1 hour	
Symptoms are present on and off for a total	2
period of 1-4 hours	
Symptoms are present on and off for a total of	3
more than 4 hours	
Symptoms are present continuously all day	4
Carrying	
I can carry heavy objects without extra pain	0
I can carry heavy objects but they give me	1
extra pain	
Pain prevents me from carrying heavy objects	2
but I can manage medium weight objects	
I can only lift light weight objects	3
I cannot lift anything at all	4
Reading and watching TV	
I can do this as long as I wish with no problems	0
I can do this as long as I wish if I'm in a suitable	1
position	
I can do this as long as I wish but it causes	2
extra pain	
Pain causes me to stop doing this sooner than I	3
would like	-

	iu blien
Pain prevents me from doing this at all	4
Working/housework	
I can do my usual work without extra pain	0
I can do my usual work but it gives me extra	1
pain	
Pain prevents me from doing my usual work	2
for more than half the usual time	
Pain prevents me from doing my usual work	3
for more than a quarter of the usual time	
Pain prevents me from working at all	4
Social activities	
My social life is normal and causes me no extra	0
pain	
My social life is normal but increases the	1
degree of pain	
Pain has restricted my social life but I am still	2
able to go out	
Pain has restricted my social life to the home	3
I have no social life because of pain	4
Driving (see below)	
I can drive whenever necessary without	0
discomfort	
I can drive whenever necessary but with	1
discomfort	
Neck pain or stiffness limits my driving	2
occasionally	
Neck pain or stiffness limits my driving	3
frequently	
I cannot drive at all due to neck symptoms  🧕	4
herapeutic Intervention	2

#### Therapeutic Intervention

Patient was admitted in IPD on 10<sup>th</sup> April 2017 and performed *Agni karma* on 2<sup>nd</sup> day of admission. Next day *Snehapana* given with *Prasrnayadi Taila*. <sup>[11]</sup>

# Procedure of Agni karma

# Poorva karma

The Agni karma therapy room well equipped with all materials and instruments required for the therapy and care of patient in aseptic condition i.e. Freshly prepared *Triphala Kwatha* (Decoction made by *Triphala*), *Aloe vera* leaf, innovated *Agni karma* probe, Probe stand, High pressure burner for making the probe red hot, LPG Cylinder, SS tray, SS bowl, Sponge holding forceps, Gloves, Sterilized plain and hole towel, Cotton, A knife, Lighter etc. Written informed consent of the patient taken prior to the procedure. *Agni karma Shalaka* (probe) was kept on burner until it become red hot. Patient was made to sit comfortably with neck forward.

## Pradhana Karma

Point with maximum tenderness were marked in the cervical region which was almost around C5-C6 region. The marked point was painted with aseptic solution of *Triphala Kwath* liquid. With the use of Red hot *Agni karma* probe, seven therapeutic burn marks were made with a distance of about an inch in skin level on the spinous and transverse process of C5-C6 body. *Samyak lakshanas* of process as described in text was observed. <sup>[12]</sup> The pulp of *Ghritakumari (Aloe vera)* leaf was applied with the help of a swab holding forceps instantly over the burn marks, as *Ghritakumari (Aloe vera*) works as instant cooling agent.

#### Paschat Karma

After a minute, the part was cleaned with sterile cotton and *"Haridra* powder" (An Ayurvedic herbal medicine used as antiseptic) was applied, patient was also advised to apply it twice a day at the site continuously for a week and application of water on the *Agni karma* site (burn marks) were prohibited for next 24 hours.



#### Procedure of Snehapana

*Prasarnyadi taila* was administered internally for *Snehana* by progressively increasing the dose for a duration of 7 days starting from 30 ml to 180 ml. Dose of the *Sneha* was fixed by keeping in consideration the *Bala, Vaya*, etc. of the patient. Metered doses of *Taila* were given in morning hours to the patient after making sure the food taken on previous day have been properly digested. He was also advised not to have food until he gets proper hunger and was instructed to sip lukewarm water after *Snehapana* to facilitate the digestion and assimilation of *Sneha. Samyak Snehan* symptoms were keenly observed on each day.<sup>[13]</sup> *Prasaranyadi Tailam* which was used for *Snehapana* was procured from E.T.M. *Oushadhashala*, Thrissur, Kerala (Sahastrayoga) Each 10 ml *Prasarnyadi Taila* used had the following contents:

Int. J. Ayur.	Pharma	Research,	2017;5(	6):22-26
Table	1. Conton	to of Duga	''	Taila

Sanskrit Name	Botanical Sources	Wt/10ml
Prasarani	Merremia tridentata	35.82 mg
Meda	Poligonatum verticiilatum	138.88 mg
Mahameda	Poligonatum cirrhifolium	138.88 mg
Shatapushpa	Anethum sowa	138.88 mg
Manjista	Rubia cordifolia	138.88 mg
Kushta	Sassurea lappa	138.88 mg
Rasna	Alpinia galanga	138.88 mg
Raktachandana	Pterocarpus santalinus	138.88 mg
Jeevaka	Malaxis acuminata	138.88 mg
Rishabaka	Malaxis muscifera	138.88 mg
Kakoli	Fritillaria roylei	138.88 mg
Ksheerakakoli	Lilium polyphyllum	138.88 mg
Devadaru	Cedrus deodara	138.88 mg
Tila	Seasmum indicum	10 ml
Go kshira	Milk of cow	10 ml

#### Outcome

A Visual Analogue Scale (VAS) is a measurement instrument that tries to measure a characteristic or attitude that is believed to range across continuous values and cannot easily be directly measured. It is often used in epidemiological and clinical research to measure the intensity or frequency of various symptoms. The patient pain score before was (09). After therapeutic intervention with Agni karma pain was found to be reduced to (05), after initiation of *Snehapana* to (04) and after the completion of *Snehapana* on 7<sup>th</sup> day it was reduced to (02).

Table 2: Subjective-	Visual Ana	logue Score	(VAS) [0 -	- 10]

Symptoms	Baseline	After Agnikarma	After Snehapana	7 <sup>th</sup> day
Pain in the neck	09 05	05 2 2	04	02
Radiating pain to the upper limb (Unilateral or bilateral)	05	04	04	02
Pain in neck movement	09	04	04	02
Shoulder pain	06	05	03	01

The NPQ consists of nine items related to pain intensity, duration of symptoms, numbness at night, pain affecting sleep, effect on social life, carrying, reading/watching television (TV), working/housework, and driving. It is widely used with good sensitivity to change, although it does not cover emotional and some social issues. For each item, there are five potential responses describing a greater degree of difficulty (from 0 = no difficulty to 4 = severe difficulty). An overall NPQ score percentage is calculated by adding together the score for each item (0-36) (total score/ $36 \times 100\%$ ). If an item is not applicable, the score is calculated as [(total score/32) ×100 %].

BEFORE TREATMENT		AFTER TREATMENT		
<ul> <li>A. Four carry have adjuste without with puts.</li> <li>B. Four carry have adjustes, but the game are write puts.</li> <li>C. Pan previous each from camping heary adjusts, but Four amount works on target adjusts.</li> <li>D. Loss and sith fully sought adjusts.</li> <li>E. Loss and the septidity a still.</li> </ul>	A. Mark Instance     B. Single Sectors     C. The same.     D. Thy sectors     Single process     B. Mark reverse	A. Lase-samp laway shipsts without without bits.     A. Lase-samp laway shipsts, the shop gives me with gald.     A. Lase samp laway shipsts, the shop gives me with gald.     A. Lase samp laway shipsts, the shipst gives and the sample shipsts.     A. Lase samp laway shipsts, the shipst shipsts.     A. Lase samp laway shipsts, the shipst shipsts.     A. Lase shipsts and the sample shipst.     A. Lase shipsts and shipst shipsts.	A Mark heres     B. Sights heres     C. The sories     D. Sights weres     D. Sights weres     D. Sights were	
within 8 -Carryling	Socilars 19 - Compared with the last time yes anonered this quarties, is your each pain:	Section 5 - Carrying	Section 10 - Compared with the lost time you answered the question, is your seck pains	
Section 4 - Relation of Representation  A. May used a varia fill of accred of 8 day  B. Leave invariance is one mode or area on training, whigh the first fills or day  C. Spanpares any present on 6 of 8 day  B. Special of 4 file.  B. Special of 4 file.  C. Spanpares are present on 6 of 8 file a similar  Special of 4 file.  C. Special operator on 6 of 8 file a similar  C. Special operator on the similar of 6 file.	Institute 8 - Noricing 64 applicable A. Stand shine estimation: instantage without elementalise, A. Stand shine estimations instantage, but with demonstrative C. Note path or reference instanta ena diriving menanimality di. Note path or reference instanta ena diriving remaintantly b. Note path or reference instanta ena diriving remaintantly B. Stom nee deline estimates that both or store, symptomes.	Bactyces 4. Instation of Symposium           A. Aby and and any final memory and any.           B. Aby and any any final memory and any.           B. Aby any and any any final memory and any.           B. B. Aby any any any any any any any any any an	Baction F. Bertring (IV application) □ B. A. Jun of the whenever increasing when discussion I. Loss show the whenever increasing. Let with discussion I. Loss when whenever increasing the well, whenever 0. Weight pairs in artiflates from the providence from the 0. Head pairs in artiflates for such contemports. 5. Loss and drive at all data to such comparements.	
house deep in ond	SPL There is used the because of parts	<ul> <li>B. Because of gross and excellencer matchesiss ( here inc) than 2 bears strong to small.</li> </ul>	E. Plan for sound US because of pure.	
A Three we plow and reaches or machinese or right.     B. How recessions press and encodes. In such as the set of th	ger team.	<ul> <li>A. There are piece and searches or standards of eligit.</li> <li>B. There are accounted grave and areaforms or industrial searches of eligit.</li> <li>C. Hy sharp in computarily absorbed by piece and excellence of eligit.</li> <li>D. Researce of place and complex to standards of the filter filter of the standards.</li> </ul>	Bouldary 8 - Backed Actificities     Bould Actificities     Bould Actification and assesses that degrees of periods     Bould actification accorded being accesses that degrees of periods     Bould Actification accorded being accesses that degrees of periods     Bould Actification accesses and think, but if acc with drift acc     Bould Actification accesses accesses accesses accesses accesses accesses     Bould Actification accesses accesses accesses accesses     Bould Actification accesses accesses accesses accesses accesses     Bould Actification     Bould Actif	
Soction 3 - Pine, Nondise or Numbered in Arms of Night	<ul> <li>B. For a prevenue can from monthing of all.</li> </ul>	Section 3 - Plan, Notifies or Nandrassi in Aritz at Night	E R. Pass provide risk from marking at arts	
Becches 1 - Faits and Managing         A. Mo shares in survey distantined by pain.           B. N. My shares in a survey distantined by pain.         B. My shares in suggestion distantined by pain.           C. My shares in a paint of them in these these 5 hourse shares primarily.         B. Mensees of paint 1 hours have been files.           H. Monsees of paint 1 hours have been files.         Bounse of paint 1 hours have been files.	Institue 1, Markhag/Hearrowsk, Els. A. Laos de operand werk bisheat come parts. B. Laos de age anal work, but it girter net energiants. S. Party process nat konne belag age analet and for instea parts but it be total taxe. B. Party provide an it bases.	Europes 2 - Parte and Mangrag →A. Mg Userp is across dimensional by pain. → A. Mg Userp is more dimensional dimensional by pain. → C. Mg Userp is regularized dimensional by pain. → D. Baseases of pains I have been than 3 beams dissiption toget. → E. Baseases of pains I have been than 3 beams dissiption toget.	Intercents Y - Warking/Hanzarwork, Bitt A. I can be ray social work without outsing point. I can be any social room, but if gives one every period C. Pais provider can brown for period work for every Page buff the stand there. D. Pais quarter of the social form:	
Anorden 1 - Daries Teresonality: A. Liver on grant at the encourse. Market of the state of the encourse of the state of	Instance 4 - Reading and Wandforg TV           A. I can be do as integral loads with an problem.           B. I can be do as integral loads. This is a similarity provider provider provider the second	Review 1 + Parks Toronation D. Theorem of parts of the promotest D. R. Theorem of parts of the second of the constant C. M. parts in machine on the research C. M. parts in machine of the research D. E. My parts in mary partners as the expension	Bartlan A - Bauding and Walabing TW           B. A. Loss of the as trap as I work with we probleme.           B. Loss of the as trap as I work, with we probleme.           C. Loss of the as trap as I work, with we probleme.           D. B. Jose do that as trap as I with, with we probleme.           D. B. Jose do that as the probleme.           D. B. Jose do that as the probleme.           D. B. Jose prevents an Down sharp that at all.	
Phone Brants This quantization has been designed to give us not in provide The Phone strength reary metrics and not be call the may contain this root that metrics and uses to call the easy contains the root of the metrics of the strength in the call and the strength of the strength of the strength of the CLOBERY DESCRIPTION TO THE PROPERTY of the strength of CLOBERY DESCRIPTION TO THE STRENGT OF THE STRENGT OF THE STRENGT OF THE STRENGT OF THE STRENGT OF THE STRENGT OF THE STRENGT OF THE STRENGT OF THE STRENGT		Phase Read: This quantization has been designed to give as table to consider ND. Phase Annual states are seen and party to give an table and the states of the states of the states and the states and the COMM. V COMPENSATE VOCA PRODUCTION.	countion as to have Plack Plats has affected your adding to manager.	

The NPQ score which was 87.5 % before the treatment found to be reduced to 33.33 %.

#### DISCUSSION

The commonly occurring pain in the neck region in such conditions are due to spasm of muscles around the area and numbness/tingling sensation in the arm is felt due to the compression of cervical nerves passing through the location. But in Ayurveda *Greevatshambha* is considered as one among *Vatavyadhi*. Also 'Shula' (Pain) is the characteristic of *Vata*. This pain can be produced by only involvement of *Vayu* or in association with other *Doshas* (*Dosha Avrita Vata*). Snehapana and Agnikarma play a major role in common line of management in Vatavvadhi. Lohadi Dhatus (Metals) are good conductors of heat, during Agnikarma when it is heated for a sufficient duration and made red hot it gets maximum capacity is to store heat. Such heated *Lohadi Shalaka* when applied over skin to attain *Samyaka dagdha*, stored heat is transferred from it to skin tissue in the form of Ushna, Tikshna, Sukshma and Laghu Guna. Ushna Gunaacts in two ways, primarily by stimulation of Dhatvagni and due to this action Sama Dhatu are digested. Secondly Ushna Guna dilates the channels of Srotas, due to which Srotavarodha removed. which was formed bv Dosha-Dushva Samurchhana during Kha-vaigunya at the Dhatu level.

In *Snehapana Sneha* enters into *Srotas* which regulates *Pratiloma Vayu-gati*, due to same *"Vatanulomanam"* is given as the prime importance in *Samyak Snigdha Lakshana*.<sup>[14]</sup> This alleviation of *Vata* helps to decrease pain to some extent.

Prasaranyadi Tailam used for Snehapana is classically mentioned as "Sarvamarutaaamaynaashanam" (One which relieves all kind of Vata disorders).<sup>[15]</sup> Also majority of its ingredients Merremia tridentata (Prasarini), Anethum sowa (Shatapushpa), Rubia cordifolia (Manjistha), Saussurea lappa (Kushta), Alpina galanga (Rasna), Pterocarpus santalinus (Raktachandana), Cedrus deodara (Devadaru) etc. have anti-inflammatory and analgesic activity.<sup>[16,17]</sup>

## CONCLUSION

Agni karma and Snehapana can be effectively used in relieving pain in cervical spondylosis. With these treatments patients can avoid the use of analgesic medicines which causes harmful side effects. Case can provide basis for further case series.

# ACKNOWLEDGEMENT

Authors are very thankful to the Director General C.C.R.A.S Dhiman Sir and Asst. Director C.A.R.I.N. and M.S.D. KG Vasanthakumar Sir for giving permission to publish the work.

# REFERENCES

- 1. McCormack BM, Weinstein PR. Cervical spondylosis: an update. West J Med. 1996;165:43–51.
- 2. Chaturvedi G, editor. 12th ed. Varansi: Chaukhambha Bharti Academy; 1984. Charak Samhita, Chikitsa Sthana, Adhyay-28, Shloka-9 Hindi Commentary; p. 777.
- 3. Bharti, Katyal S, Kumar A, Makhija R, Devalla RB. Clinical observation on Greeva Stambha (cervical spondylosis) Chikitsa. Ayu. 2010;31(2):218-222.

#### Cite this article as:

Charde VA, Amit, Nair PG, Deep VC. Role of Agni Karma and Snehapana in Management of Pain in Cervical Spondylosis: A Case Study. International Journal of Ayurveda and Pharma Research. 2017;5(6):22-26. Source of support: Nil, Conflict of interest: None Declared

- Shastri A, editor. Sushrutha Samhita of Sushruta, Nidanasthana, Ch. 1, Ver.67. Part 1. Varanasi: Chaukhambha Sanskrit Sansthan; 2009. p. 303
- 5. Rao R. Neck pain, cervical radiculopathy, and cervical myelopathy. J Bone Joint Surg [Am] 2002;84-A:1872–1881.
- 6. Kale S, Sonwane R. Evaluation Of The Efficacy Of Mashadi Tail Nasya In The Management Of Manyastambha With Special Reference To Cervical Spondylosis. International Ayurvedic medical Journal {online} 2016 July
- Shastri A, editor. Sushrutha Samhita of Sushruta, Chikitsasthana, Ch. 4, Ver. 8. Part 1. Varanasi: Chaukhambha Sanskrit Sansthan; 2009. p. 34.
- 8. http://www.physio-pedia.com/Spurling%27s\_Test last accessed on 25th april 2017 at 10.52 Am
- 9. J. Lhermitte and N. M. Bollak, "Les douleurs à type de décharge électrique consecutives a la flexion céphalique dans la sclérose en plaque," Revista de Neurologia, vol. 2, pp. 36–52, 1924.
- 10. González T, Balsa A, Sáinz Murieta J, Zamorano E, González I, Martin-Mola E. Spanish version of the Northwick Park neck pain questionnaire: reliability and validity. Clin Exp Rheumatol. 2001;19:41–46.
- 11. Sharma R, Sharma S; Sahastrayogam, Taila Prakarana, Chaukhamba Sanskrit Pratisthan, reprint ed. 2014 pg. ed. no. 104
- Shastri A, editor. Sushrutha Samhita of Sushruta, Sutrasthana, Ch. 12, Ver. 16. Part 1. Varanasi: Chaukhambha Sanskrit Sansthan; 2009. p. 53
- Shastri K, Chaturvedi G, editor. Charaka Samhita of Agnivesha, Sutra Sthana. Ch. 13, Ver. 58. Part1. Varanasi: Chaukhambha Sanskrit Sansthan; 2008. p. 271.
- 14. Shastri A, editor. Sushrutha Samhita of Sushruta, Sutrasthana, Ch. 12, Ver. 8. Part 1. Varanasi: Chaukhambha Sanskrit Sansthan; 2009. p. 51.
- 15. Sharma R, Sharma S; Sahastrayogam, Taila Prakarana, Chaukhamba Sanskrit Pratisthan, reprint ed. 2014 pg. no. 104
- Arunachalam K, Parimelazhagan T, Manian S. Analgesic and anti-inflammatory effects of Merremia tridentata (l.) hallier f. Int J Pharm Pharm Sci. 2011;3:75-9.
- 17. Krishnappan AL, Seetharaman TR. Flavonoids of Merremia tridentate. Fitoterpia. 1992;63:190

#### \*Address for correspondence Dr VA Charde Research officer (Ayu), Central Ayurveda Research Institute for Neuromuscular & Musculo– Skeletal Disorders (CARINMSD), CCRAS, Cheruthuruthy, Kerala, India. Email: yaibhayayudoc@gmail.com

Disclaimer: IJAPR is solely owned by Mahadev Publications - A non-profit publications, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJAPR cannot accept any responsibility or liability for the articles content which are published. The views expressed in articles by our contributing authors are not necessarily those of IJAPR editor or editorial board members.