



Holistic Management of Ankylosing Spondylitis through Ayurveda: A Case Study

Yadav N^{1*}, Panja S², Kharjule S³, Bhaduri T⁴

DOI:10.21760/jaims.10.4.53

^{1*} Neha Yadav, Second Year Post Graduate Scholar, Department of Kayachikitsa, Institute of Post Graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra Pith (SVSP), Kolkata, West Bengal, India.

² Soumya Panja, Second Year Post Graduate Scholar, Department of Kayachikitsa, Institute of Post Graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra Pith (SVSP), Kolkata, West Bengal, India.

³ Shwetangi Kharjule, Second Year Post Graduate Scholar, Department of Kayachikitsa, Institute of Post Graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra Pith (SVSP), Kolkata, West Bengal, India.

⁴ Tapas Bhaduri, Reader and Head, Department of Kayachikitsa, Institute of Post Graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra Pith (SVSP), Kolkata, West Bengal, India.

Ankylosing Spondylitis is a group of spondylarthrosis, chronic autoimmune inflammatory disorder. Primarily it affects axial skeleton and gradually it affects peripheral joint and extra articular structure. Presence of sacroiliitis and structural changes is seen in this disorder. The usual presentation of Ankylosing Spondylitis is morning stiffness which is relieved after exercise or activity. The term "Ankylosing Spondylitis" is not mentioned in our ancient classics but the signs and symptoms can be clinically correlated to Kati Prishtha Trik Graha in Ayurveda. Here major symptoms are Stambha and Shula in Kati Pradesh with Vata Kapha Dosha predominance. This was a single case study conducted at I.P.G.A.E&R at SVSP Kolkata. A 45 yrs old female patient, came to the Out Patient Department, complaining of pain and stiffness in Kati Prishtha Trik Pradesh. She was diagnosed with Ankylosing Spondylitis and bilateral Sacroiliitis 7 years ago. Management was done according to the principle of Kati Prishtha Trik Graha. Treatment plan included Classical Virechana, Erandamuladi Niruha Basti in Kala Yoga followed by Samana Aushadhi. The disease activity was further analysed using BASDAI and ASDAS- CRP score and we got promising results by the treatment without any adverse effects.

Keywords: Ankylosing Spondylitis, Kati Prishtha Trik Graha, Erandamuladi Niruha Basti, Ayurveda

Corresponding Author	How to Cite this Article	To Browse
Neha Yadav, Second Year Post Graduate Scholar, Department of Kayachikitsa, Institute of Post Graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra Pith (SVSP), Kolkata, West Bengal, India. Email: nehayv8@gmail.com	Yadav N, Panja S, Kharjule S, Bhaduri T, Holistic Management of Ankylosing Spondylitis through Ayurveda: A Case Study. J Ayu Int Med Sci. 2025;10(4):344-351. Available From https://jaims.in/jaims/article/view/4263/	

Manuscript Received
2025-03-12

Review Round 1
2025-03-27

Review Round 2
2025-04-07

Review Round 3
2025-04-17

Accepted
2025-04-27

Conflict of Interest
None

Funding
Nil

Ethical Approval
Not required

Plagiarism X-checker
11.62

Note



© 2025 by Yadav N, Panja S, Kharjule S, Bhaduri T and Published by Maharshi Charaka Ayurveda Organization. This is an Open Access article licensed under a Creative Commons Attribution 4.0 International License <https://creativecommons.org/licenses/by/4.0/> unported [CC BY 4.0].



Introduction

Ankylosing Spondylitis comes from Greek Word (Ankylos + Spondylitis) Ankylosis means Stiffness or fixation of a joint as a result of a disease process with fibrous or bony union across the joint i.e. fusion and Spondylitis is inflammation of one or more vertebrae. It is defined by the presence of Sacroiliitis and other structural changes which may eventually progress to bony fusion of the spine. There is syndesmophyte formation along the corners of vertebral body with bridging, giving rise to bamboo spine appearance. It usually manifests in 2nd or 3rd decade with male: female ratio of about 3:1 and 0.1 to 1.4 % of global population.[1]

The prevalence of AS in a population is directly related to the frequency of HLA-B27 antigen. Ankylosing Spondylitis evolves slowly, with fluctuating symptoms of spinal inflammation. Secondary osteoporosis of the vertebral bodies frequently occurs, leading to increased risk of vertebral fractures. Spinal fusion varies in its extent and in most cases ankylosis develops in many patients over a period of many years. In India the prevalence of Ankylosing Spondylitis (AS) is estimated to be between 0.7 and 1.0 per 1000 people, with a higher prevalence in men than women. NSAID and Steroids are the drug of choice in conventional methods but fails to provide complete cure. There is no direct reference to this disease in Ayurveda but we can clinically correlate its sign and symptoms to *Kati Prishtha Trika Graha* in contemporary science, as there is marked presence of *Shoola* (pain), *Graha* (stiffness) in *Kati* (pelvis) *Prishtha* (posterior region of trunk from neck to pelvis) and *Trika Pradesh* (around shoulder girdle). We also get description regarding such disorders under the concept *Vata vyadhi as Prishtha Graha and Trika Graha* which has been mentioned under 80 types of *Vataja nanatmaja vyadhi* and *avarana of Vata* with other *dosa* are also mentioned.

Case Study

A female patient named Mrs. XYZ, 43 yrs of age came to Kayachikitsa OPD of I.P.G.A. E& R at SVSP Kolkata on, OPD Reg.No-AYUR/RG240001xxxx.

Chief complaints with duration

1. *Kati Sula* (Low back pain) & *Stambha* (stiffness) for past 4 yrs, not relieved by rest.

2. *Griva Graha* (Restricted movement of neck) & *Prishtha Graha* (restricted movement of hip joint) for last 4 yrs.

3. *Satata Ruja* with *Panguta* (Pain with difficulty in forward bending) for last 3 yrs.

4. *Stambha* at *Griva* and *Amsa Sandhi* (Restricted movement of neck and shoulder joint) for last 2 yrs.

5. *Pada Sotha* (Swelling) in both feet for last 3 months.

History of present illness

Low back pain radiating to both lower limbs along with stiffness which usually lasts for one hour and after waking up from bed it gradually reduces after some movement or exercise. Patient was unable to sit without support. Even she can't turn backwards. Restricted joint movement specially at neck, shoulder and hip joint.

Disease gets aggravated by cold exposure and long standing (>15 minutes).

- Time of onset - 7 yrs ago
- Mode of onset - Chronic
- Progress - Gradual.
- Severity - Severe
- Past Medical History - Hypothyroidism (On Modern Medication)
- Past Surgical History - Lower Uterine Segment Caesarean Section.
- Occupation - House wife
- Marital Status - Married
- Family History - Her paternal aunt (elder sister of her father) had same disease.

Vitals

- Pulse: 78 b/min
- BP: 126/82 mm of Hg
- Respiratory rate: 14/min
- Temp: 98.4°

General Examination

Patient was Alert, Cooperative & Conscious.

- Pallor: Present
- Icterus: Absent
- Cyanosis: Absent
- Clubbing: Absent

- Oedema: B/L pitting oedema in feet
- Gait: Antalgic gait
- Lymphadenopathy: Absent
- Posture: Altered (cervical lordosis is lost)

Personal History

- Appetite: Diminished
- Digestion: Proper
- Bowel: Constipated
- Bladder: Regular
- Sleep: Disturbed due to pain.
- Diet: Non vegetarian.

Ashta Vidha Pariksha

- *Nadi: Vata-Kaphaja, Manda Gati*
- *Mala: Baddha*
- *Mutra: Shweta*
- *Jihva: Upalipta*
- *Shabda: Prakrit*
- *Sparsha : Adra*
- *Drik: Sthira*
- *Akriti: Madhyam*

Musculoskeletal System

Inspection:

Loss of cervical lordosis.

Palpation

- Pain (squeezing in nature) & tenderness in lumbosacral and cervical joint.
- Chest expansion - 3cm (Inspiration - 37 cm & Expiration - 34cm)
- Restricted movement of hip and knee joint, difficulty in flexion and abduction, with shorter step length.
- Schober’s test[2]- positive (< 5cm)
- Straight Leg Rising Test (SLRT)[3] - Positive
 - Right leg - 15°
 - Left Leg - 20°

Below table shows Range of Movement in Cervical Spine, Lumbar spine and Shoulder joint just before the treatment.

SN		Motion	Degree
1.	Cervical Spine	Flexion Hyperextension Lateralflexion Rotation	46° 70° 10° Restricted
2.	Lumbar Spine	Flexion Extension Lateralbending Rotation	Restricted (B/L) 15° (Right leg), 20° (Left Leg) Restricted (B/L) Restricted (B/L)
3.	Shoulder Joint	Abduction Adduction InternalRotation	90° (Right), 110° (Left) 20° (Right), 30°(Left) 30° (Right), 45° (Left)

Investigations

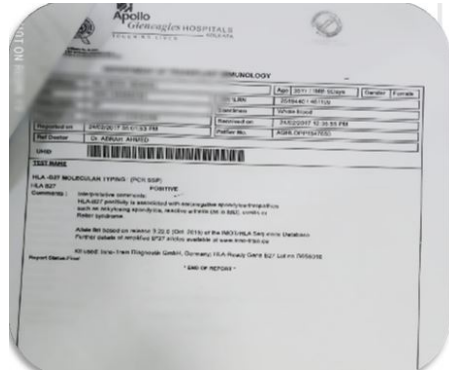
16.02.20

- HLA-B27 POSITIVE;

04.06.24

- CRP - 7.8, Hb - 10.8%, ESR - 101
- Digital - X RAY pelvis with both hip joint-subarticular sclerosis of both SI Joints suggestive of B/L Sacroiliitis.
- Digital - X RAY - cervical Spine: Cervical lordosis is lost. Calcification noted on anterior spinal ligaments.





Diagnosis.

She is a pre-diagnosed case of Ankylosing Spondylitis.

On the basis of *Dosha & Lakshan* we diagnosed this case as *Kati Prishtha Trik Graha*. [4]

Treatment

Shodhana Chikitsa followed by *Shamana Aushadhi* was planned accordingly.

Date	Procedure	Drugs	Dose
06.06.24 to 10.06.24	Dipana and Pachana	Powder Pancha Kola	5gm twice daily before food with one cup of Leuk warm water
11.06.24 to 15.06.24	Abhyantar Snehana (internal oleation)	Mahatiktta Ghrita[5]	30 ml once daily morning empty stomach with Leuk warm water
16.06.24 to 19.06.24	Abhyanga (External oleation) Nadi Sweda (Sudation)	Prasarani Taila [6] Kati Basti[7] with Mahanarayan Taila[8] for 30 days Dashmoola Kwath	
19.06.24	Virechana (Purgation)	Trivritta Avaleha (50gm) + Abhyadi Modak (2 pills) + Triphala Kwath (50ml) after Samyak Snehana and Swedan	Total Virechana Vega - 15 (Diet - Mudga Juice in Lunch and Dinner)
20.06.24 to 22.06.24	Samsarjana Karma		Lunch and Dinner Day 1 - Semisolid Khichdi Day 2 - Veg boiled Day 3 - Non-veg boiled. Day 4 onwards Normal Diet.
23.06.24 to 28.06.24	Cupping Therapy[9]	-	-
29.07.24 to 13.08.24	Kala Basti for 15 days after Bahya Snehana & Sarvang Swedan (Patra Pinda Sweda)[13]	Eranda Muladi Niruha Basti[10,11] (350ml), Saindhavadi Taila [12] Anuvasana Basti (60 ml) Ingredients for Patra Pinda -Leaves of Nirgundi, Eranda, Chinch, Dhatura, Shigru, Lemon, Garlic, Grated Coconut, Rasnadi Churna, Haridra, Methika, Saindhav lavana	
16.08.24	Patient was given discharge	Samana Aushadhi mentioned below	Pathya & Apathya was instructed.

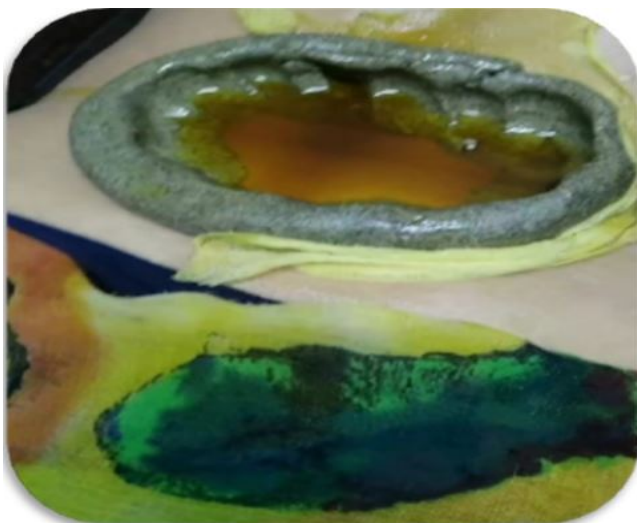


Figure 1: Kati Basti



Figure 2: Patra Pinda Swedan



Figure 3: Cupping Therapy



Figure 4: Erandamuladi Niruha Basti in preparation.

Shamana Aushadhi administered mentioned below.

Drugs (Shamana Aushadhi for one month)	Dosage	Anupan	Therapeutic Indication
Trayadasang Guggulu [14,15,16]	500 mg twice daily after food	Sukhos najala	Katigraha, Gridhrasi, Bahuprishtahangraha, Majjagatavata, Snayugata etc.
Rasnasaptak Kwath [17]	15ml twice daily before food	Sukhos najala	Janghasula, Urusula, Pristhasula, Triksula, Parsvasula
Vaiswanar Churna [18]	5gm twice daily after food	Sukhos najala	Sula, Vibandha, Vataja vikar
Erand Taila [19]	10ml at bedtime	Sukhos najala	Gridhrasi, Urugraha, Katisula

Progress of the treatment

Patient was admitted with severe back pain & stiffness. She was unable to sit properly in squat position associated with difficulty in forward & backward bending.

Therapeutic Procedures and Results

SN	Therapeutic Procedure	Results
1.	Dipana & Pachana with Powder Panchakola (06.06.24 to 10.06.24)	Lightness of the body and improved digestion.
2.	Abhyantar (Internal) Snehana with Mahatikta Ghrita (11.06.24 to 16.06.24).Bahya (External) Snehana with Prasarani Taila (16.06.24 to 19.06.24) + Kati Basti with Mahanarayan Taila + Nadi Sweda.	Pain increased. Pain subsided.
3.	After Virechana Karma (19.06.24)	She got symptomatic relief.
4.	Samsarjana Karma (20.06.24 to 22.06.24)	Again, she complained of pain.
5.	Cupping therapy (30 minute) at upper back (23.06.24 to 28.06.24)	She got relief from stiffness.
6.	Basti Karma (29.07.24 to 13.08.24)	Moderate pain during Niruha Basti which was relieved following Anuvastana Basti.
7.	Patra Pinda Sweda for 15 days (29.07.24 to 13.08.24)	She got mild relief.

Results

This Ayurveda approach tackles the root cause of the disease, exemplifying fundamental principles of Ayurveda. The combined treatment protocol showed encouraging results. Significant improvement was recorded in ASDAS - CRP Score[20] and BASDAI Score,[21] thus making quality of life better than before.

ASDAS - CRP Score Before and After Treatment

ASDAS-CRP Score	Before Treatment	After Treatment (15th Day After Discharge)
Back Pain (0-10)	8	3
Duration of morning stiffness (0-10)	5	1
Patient Global Assessment of Disease Activity (0-10)	6	3
Peripheral pain and Swelling (0-10)	6	2
CRP	7.8 mg/l	5.2
Calculated ASDAS -CRP Score	3.136	1.953
Disease Activity	Very High Disease Activity	Moderate Disease Activity

BASDAI Score Before and After Treatment

BASDAI Score	Before Treatment	After Treatment
Fatigue	8	3
Spinal pain	4	2
Arthralgia (joint pain) or swelling	6	2
Enthesitis	4	2
Morning stiffness (duration)	5	1
Morning stiffness (severity)	3	1
Disease Activity	5.7	2.0
	Very High Disease Activity	Moderate Disease Activity

SN		Motion (With Degree of Movement)	Degree of Movement (Before Treatment)	Degree of Movement (After Treatment)
1.	Cervical Spine	Flexion (40-50°) Hyperextension (50 - 80°) Lateralflexion (30-45°) Rotation (70-80°)	46° 70° 10° Restricted	48° 76° 12° Restricted
2.	Lumbar Spine	Flexion (70-80°) Extension (20-30°) Lateralbending (20-30°) Rotation (10-15°)	Restricted(B/L) 15° (Right Leg) 20° (Left Leg) Restricted(B/L) Restricted/L	Restricted(B/L) 18° Right Leg 26° (Left Leg) Restricted (B/L) Restricted/L
3.	Shoulder Joint	Abduction (70-180°) Adduction (30-45°) Internal Rotation (90-110°)	90° (Right), 110° (Left) 20° (Right), 30° (Left) 30° (Right), 45° (Left)	98° (Right), 120° (Left) 26° (Right), 34° (Left) 40° (Right), 60° (Left)

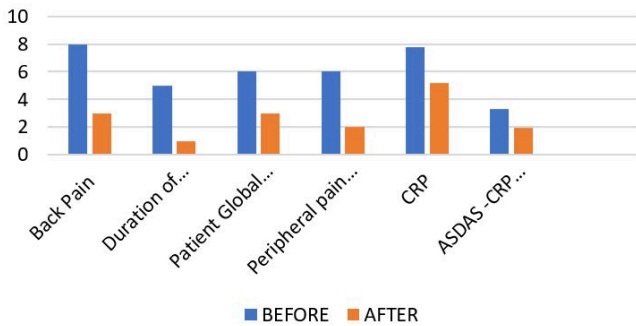
Above are the changes observed in ASDAS - CRP and BASDAI Score Before and After treatment in Graphical Representation.

Below Table Shows Changes in Range of Motion Before and After Treatment.

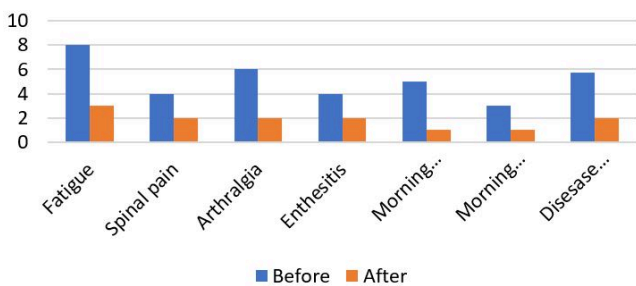
Discussion

Ankylosing Spondylitis is a chronic inflammatory disease. *Shodhana Karma* followed by *Shamana Chikitsa* showed promising results in the management of the disease. The present study showed multimodal Ayurveda treatment with encouraging results in the management of the disease. *Vata* and *Kapha* are the two main pathological factors in the disease *Kati Prishta Trik Graha*. Vitiated *Vata* along with *Kapha Dosha* gets lodged in *Kati Prishta Trik Pradesh* causing *Sroto Sanga* and thereby hamper in the production of *Dhatu's* like *Asthi*. The patient complained of symptoms like *Gourava* (heaviness), *Alasya* (lethargy), *Aruchi* (aversion), *Apakti* (indigestion), *Malasanga* (constipation) which are the key features of *Sama Dosha*. *Ama Dosha* is the key factor in the pathogenesis of every disease, so powder *Pancha Kola* was given which enhances digestion and improves *Dhatwagni*. *Sarvang Snehana* with *Prasarani Taila* followed by *Nadi Swedan* relieves aggravated *Vata-Kapha Dosha* thereby it reduces pain and swelling. *Patra Pinda Swedan* being *Ruksha* in nature relieves stiffness in the body. *Patra* applied for *Patra Pinda Swedan* were *Nirgundi* (*Vitex negundo*), *Eranda* (*Ricinus communis*), *Arka* (*Calotropis gigantea*), *Shigru* (*Moringa oleifera*). The leaves were heated and fried together with other ingredients and tied into a bolus which was then massaged all over the body. As the body began to sweat due to the *Swedan* treatment resulting in reduction of swelling, muscle pain and stiffness. It is also having anti-inflammatory and analgesic effect. *Kati Basti* with *Mahanarayan Taila* is found to be very effective in various *Vata Vyadhi*. On its application it relieves pain and improves *Bala* (strength) and *Varna* (complexion). Cupping therapy at upper back increases localised blood circulation thus reducing inflammation and hence alleviates muscle pain and stiffness. *Basti* is the best line of treatment for aggravated *Vata Dosa*. *Erandamula* is said to be best *Vatahara Dravya*. It relieves the pain located at *Janga-Uru-Paada-Trika-Prishta Shoola* (thigh, foot, sacral region,

ASDAS CRP-Score



BASDAI Score



And back) region and is also *Lekhaneeya* in action (scrapes out *Ama* and vitiated *Dosha* from the body). It also performs *Srotosodhan* (removing blockage in the channels of circulation) thus performing *Samprapti Vighattan*. It has a wide spectrum of action and effectively used in various diseases.

Role of Internal Medication

Trayadasang Guggulu has potent *Vata Kapha Shamak* property and proved anti-inflammatory, analgesic, muscle relaxant and antioxidant action. It is indicated in *Katigraha*, *Snayu Gatavata* and other various *Vatik* disorders. *Rasna Saptak Kwath* with chief ingredients like *Rasna (Pluchea lanceolata)*, *Gokshura (Tribulus terrestris)*, *Guduchi (Tinospora cordifolia)*, *Punarnava (Boerhavia diffusa)*, *Eranda (Ricinus communis)*, *Devdaru (Cedrus deodara)* *Aragvadh (Cassia fistula)*, *Sunthi (Zingiber officinale)* has excellent *Vatahara* property. They possess potent anti-inflammatory, analgesic, immunomodulatory and antioxidant properties. It is specially indicated in *Janguapristhatrikaparsa Shula* (pain in thigh, back, sacral region, etc). *Vaiswanar Churna* stimulates digestive fire (*Dipta Agni*), reduces swelling (*Shotha Prasamana*) and has potent anti-inflammatory action. *Eranda Taila* is the drug of choice in *Vata Vyadhi*, not only it eliminates *Ama* and other toxins from the body but also it alleviates aggravated *Vata Dosha* thus reducing pain, stiffness and improves the mobility of the joints.

Conclusion

This study has showed that Ayurvedic treatment modalities is highly effective in the management of Ankylosing Spondylitis, as evidenced by marked reduction in BASDAI & ASDAS score, assessed on the basis of improvement in both signs & symptoms. Thus, the presented paper provided an opportunity for standardisation of Ayurvedic assessments and treatment procedures which are therapeutically safe and effective. This approach may be taken into consideration for further efficient management of Ankylosing spondylitis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. The patient has been informed that his initials will not be published and due efforts will be made to conceal the identity.

References

1. Ralston SH, Clunie GPR. Principles and practice of medicine. In: Davidson's Rheumatology and Bone Disease. 23rd ed. New York: McGraw-Hill; 2018. Ch. 24. p. 1030. ISBN: 978-0-7020-7028-0 [Crossref][PubMed][Google Scholar]
2. Abdullah ABM. Radiology in medical practice. In: Ankylosing Spondylitis. 6th ed. [Place of publication]: [Publisher]; [Year]. Ch. 6. p. 429. ISBN: 978-81-312-5816-3 [Crossref][PubMed][Google Scholar]
3. Kundu AK. Bedside clinics in medicine. Part 1: Nervous System. 8th ed. [Place of publication]: [Publisher]; 2019. p. 179. ISBN: 978-81-906355-9-2 [Crossref][PubMed][Google Scholar]
4. Tripathi I. Gadanigraha. In: Dvitiyakhandaatmaka "Athatavatavyadhichikitsitam Vyakhyasamah. " Sloka 160. Varanasi: Chaukhamba Sanskrit Sansthan; 2011. p. 508. ISBN: 8186937-14-5 [Crossref][PubMed][Google Scholar]
5. Tewari P, Kumari A, editors. Yoga Ratnakar. Part 1. Varanasi: Chaukhamba Visva Bharati; 2010. *Vatarakta*, Ch. 26, Ver. 78-79. p. 632. ISBN: 978-81-909871-7-2 [Crossref][PubMed][Google Scholar]
6. Tewari P, Kumari A, editors. Yoga Ratnakar. Part 1. Varanasi: Chaukhamba Visva Bharati; 2010. *Vatarakta*, Ch. 25, Ver. 259-267. p. 604. ISBN: 978-81-909871-7-2 [Crossref][PubMed][Google Scholar]
7. Patil V. Principles and practice of Panchakarma. Varanasi: Chaukhamba Publications; 2017. *Snehana Karma*, Ch. 8. p. 168-70. ISBN: 978-93-81608-37-1 [Crossref][PubMed][Google Scholar]
8. Rao P, editor. Chakradutta of Cakrapanidatta. Varanasi: Chaukhamba Orientalia; 2014. Ch. 22, Ver. 132-141. p. 225. ISBN: 978-81-7637-314-2 [Crossref][PubMed][Google Scholar]
9. National Institutes of Health (NIH). Cupping therapy [Internet]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK538253/> [Crossref][PubMed][Google Scholar]
10. Patil V. Principles and practice of Panchakarma. Varanasi: Chaukhamba Publications; 2017. *Basti Karma*, Ch. 13. p. 507. ISBN: 978-93-81608-37-1 [Crossref][PubMed][Google Scholar]

11. Shastri K, Chaturvedi G, editors. Caraka Samhita. Vidyotini Vyakhya. Varanasi: Chaukhamba Orientalia; [Year]. *Bastisutriya Siddhi Adhyaya, Ch. 3, Ver. 38-42. p. 918. ISBN: 978-93-84541-29-3* [Crossref][PubMed][Google Scholar]
 12. Shastri KA, editor. Bhaisajya Ratnavali. "Vidyotini" Hindi Vyakhya. Varanasi: Chaukhamba Orientalia; 2022. *Amavata Chikitsa Prakaran, Ch. 29, Ver. 215-221. p. 630. ISBN: 978-93-86735-39-3* [Crossref][PubMed][Google Scholar]
 13. Patil V. Principles and practice of Panchakarma. Varanasi: Chaukhamba Publications; 2017. Swedan Karma, Ch. 9. p. 213-14. ISBN: 978-93-81608-37-1 [Crossref][PubMed][Google Scholar]
 14. Tewari P, Kumari A, editors. Yoga Ratnakar. Part 1. Varanasi: Chaukhamba Visva Bharati; 2010. *Vatarakta, Ch. 25, Ver. 204-209. p. 599-600. ISBN: 978-81-909871-7-2* [Crossref][PubMed][Google Scholar]
 15. Rao P, editor. Chakradutta of Cakrapanidatta. Varanasi: Chaukhamba Orientalia; 2014. Ch. 22, Ver. 72-75. p. 217. ISBN: 978-81-7637-314-2 [Crossref][PubMed][Google Scholar]
 16. Tripathi I. Gadanigraha. In: Dvitiyakhandatmaka "Athatovatavyadhichikitsitam Vyakhyasamah. " Sloka 161-164. Varanasi: Chaukhamba Sanskrit Sansthan; 2011. p. 508. ISBN: 8186937-14-5 [Crossref][PubMed][Google Scholar]
 17. Tewari P, Kumari A, editors. Yoga Ratnakar. Part 1. Varanasi: Chaukhamba Visva Bharati; 2010. *Vatarakta, Ch. 28, Ver. 20. p. 643. ISBN: 978-81-909871-7-2* [Crossref][PubMed][Google Scholar]
 18. Shastri KA, editor. Bhaisajya Ratnavali. "Vidyotini" Hindi Vyakhya. Varanasi: Chaukhamba Orientalia; 2022. *Amavata Chikitsa Prakaran, Ch. 29, Ver. 48-51. p. 618. ISBN: 978-93-86735-39-3* [Crossref][PubMed][Google Scholar]
 19. Tripathi I. Gadanigraha. In: Dvitiyakhandatmaka "Athatovatavyadhichikitsitam Vyakhyasamah. " Sloka 156. Varanasi: Chaukhamba Sanskrit Sansthan; 2011. p. 507. ISBN: 8186937-14-5 [Crossref][PubMed][Google Scholar]
 20. Medscape. ASDAS-CRP (Ankylosing Spondylitis Disease Activity Score) [Internet]. Available from: <https://reference.medscape.com/calculator/290/asdas-crp-ankylosing-spondylitis-disease-activity-score> [Crossref][PubMed][Google Scholar]
 21. Spondylitis Association of America. BASDAI Score Calculator: Ankylosing Spondylitis (AS) [Internet]. Available from: <https://spondylitis.org/basdai-calculator/>. [Crossref][PubMed][Google Scholar]
- Disclaimer / Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of Journals and/or the editor(s). Journals and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.