IAMJ

A COMPARATIVE CLINICAL STUDY ON MATRA BASTI WITH BALA TAILA AND SAHACHARA TAILA

Yadukrishnan V. P[1], Praveen B. S[2]

[1]PG Scholar, [2]Professor
Department of P.G Studies in Panchakarma, Alva's Ayurveda Medical College and Hospital, Moodubidire, Dakshina Karnataka, India

Corresponding Author: yadukrishnan10793@gmail.com

Check for updates

ABSTRACT

Basti is said to be the best therapy for pacifying aggravated *Vata Dosha*. It is considered as *Ardha Chikitsa* due to the capacity to cure diseases of either *Abhyantara, Bahya* or *Madhyama Roga Marga* when used judiciously. It is broadly classified into *Niruha, Anuvasana* and *Uttara Basti Anuvasana Basti* believed to nourish the body and increase *Bala* (strength) and *Varna* (complexion). *Matra Basti* is a type of *Anuvasana Basti* in which the *Sneha* is administered in the lowest dosage. *Gridhrasi* is one among *Vataja Nanatmaja Vikara* characterised by *Stabdhata* (stiffness), *Vedana* (pain), *Toda* (pricking sensation) in the lumbar region radiating to the lower limb. *Gridhrasi* is of two types viz *Vataja* and *Vata Kaphaja Gridhrasi*. *Vataja Gridhrasi* is characterized by severe pain whereas, *Vata Kaphaja Gridhrasi* has symptoms viz *Tandra* (drowsiness), *Gaurava* (heaviness of body) and *Aruchi* (anorexia). *Bala Taila* contains *Madhura Rasa, Snigdha, Vatahara, Balya, Brumhana* properties. *Sahachara Taila* contains *Madhura Tikta Rasa*, *Ushna Veerya* and *Vata-Kaphahara* properties. This study was undertaken to compare the efficacy of *Matra Basti* with *Bala Taila* and *Sahachara Taila* in the management of *Gridhrasi* to ascertain a better modality. Statistical analysis showed that both groups showed good improvement in various parameters of *Gridhrasi*. When compared between the groups it revealed that there was not statistically difference except in S Lanss Pain Score (p<0.05). Hence it can be concluded that both *Bala Taila Matra Basti* and *Sahachara Taila*

Matra Basti may be practiced in treating patients with *Gridhrasi* (Sciatica) to reduce both signs and symptoms successfully.

Keywords: *Matra Basti, Gridhrasi, Bala Taila, Sahachara Taila*

INTRODUCTION

Basti is said to be the best therapy for pacifying aggravated *Vata Dosha*. It is considered as *Ardha Chikitsa* due to the capacity to cure diseases of either *Abhyantara*, *Bahya* or *Madhyama Roga Marga* when used judiciously[1]. It is broadly classified into *Niruha, Anuvasana* and *Uttara Basti. Anuvasana Basti* is believed to nourish the body and increase *Bala* (strength) and Varna (complexion). *Matra Basti* is a type of *Anuvasana Basti* in which the *Sneha* is administered in the lowest dosage through anorectal route[2].

 Gridhrasi is a clinical entity that produces intense pain and hampers day to day activities, affecting valuable hours. *Gridhrasi* is one among *Vataja Nanatmaja Vikara* characterized by *Stabdhata* (stiffness), *Vedana* (pain), *Toda* (pricking sensation) in *Kati* (waist) and radiating to *Prishta* (back), *Uru* (thigh), *Janu* (knee), *Janga* (calf) and *Pada* (foot). *Gridhrasi* is of two types viz *Vataja* and *Vata Kaphaja Gridhrasi. Vataja Gridhrasi* is characterized by severe pain whereas, *Vata Kaphaja Gridhrasi* has symptoms viz *Tandra* (drowsiness), *Gaurava* (heaviness of body) and *Aruchi* (anorexia)[3,4]. Sciatica refers to pain in the lumbar region which may radiate to the buttock, thigh, calf and foot, and pain is experienced along the sciatic nerve pathway. This term is more specifically used to denote nerve dysfunction caused by compression of one or more lumbar or sacral nerve roots from a spinal disc herniation[5]. *Siravyada*, *Basti Karma* and *Agnikarma* have extolled treatment in *Gridhrasi* and *Sneha Pana, Abhyanga* is the other choice of treatment[6,7]. *Matra Basti* is considered one of the best treatments for *Vatavyadi* due to fewer rituals and maximum benefits. *Bala Taila, Sahachara Taila* and *Mulaka Taila* are specifically indicated in the management of *Gridhrasi*[8]. *Bala Taila* (Sida cordifolia) possesses Madura Rasa, *Sheeta Veerya, Balya*, *Kanthikara, Snigdha, Vatahara, Raktapittahara*

and *Vrunahara* properties[9]. *Sahachara Taila* consists of *Mula, Patra* and *Shakha* of *Sahachara, Ksheera,* sugar and *Tila Taila* which are indicated in all varieties of *Vata* diseases. Hence this study was conducted to evaluate the efficacy of *Bala Taila Matra Basti* and compare it with *Sahachara Taila Matra Basi* to ascertain the better modality in the management of *Gridhrasi.*

Aim and Objectives

1. To evaluate the efficacy of *Bala taila Matra Basti* in the management of *Gridhrasi* (Sciatica).
2. To compare the efficacy of *Sahachara Taila* and *Bala Taila Matra Basti* in the management of *Gridhrasi* (Sciatica).

Materials and Methods

Literary Source: - All the *Ayurveda* and contemporary texts including websites about procedure, disease and drugs will be reviewed and documented for the intended study.

Sample Source: -Patients suffering from *Gridhrasi* (sciatica) was selected from the *Panchakarma* OPD and IPD of Alva's Ayurveda Medical College and Hospital, Moodbidri. **Drug Source**: - The drugs were collected from the local areas and markets after proper identification. *Bala Taila* and *Sahachara Taila* were prepared in Alva's Ayurveda Pharmacy, Mijar.

METHOD OF COLLECTION OF DATA

Study Design: - A Randomized Controlled single-blind clinical study.

Sample Size: - Group STMB – *Sahachara Taila Matra Basti* (Standard Control group) and Group BTMB – *Bala Taila Matra Basti* (Trial group) consist of 20 patients each.

1. **Diagnostic Criteria: -**Radiating pain starts from *Sphik* radiating to *Kati, Prishta, Janu, Jangha,* and *Pada* and positive SLR Test.

Inclusion Criteria

1. Patients with symptoms of radiating pain from *Sphik* and *Kati* to *Prishta, Uru. Janu, Janga* and *Pada.*
2. Patients between age group 20-60 years of either sex.
3. Patients who were fit for Basti Karma.

Exclusion Criteria

1. Traumatic, Infective, Degenerative Conditions of Spine.
2. Congenital Spinal Anomalies.
3. Pregnant and Lactating Women.
4. Patients who are contraindicated for Basti karma

PROCEDURE: - 40 patients were assigned into two groups. **Group STMB-** Patients of this group were administered *Matra Basti* with *Sahachara Taila* in a dose of 72 ml every day for 7 days. **Group BTMB-** Patients of this group were administered *Matra Basti* with *Bala Taila* in the dose of 72 ml every day for 7 days.

***Poorva Karma*: -** *Abhyanga and Nadi Sweda* was done on the abdomen, buttock region, low back region, lower abdomen. The patient is offered Light Diet. The patient is asked to evacuate their bowel and bladder. The patient is made to lie in the left lateral position with the right leg flexed. *Saindhava and Shatapushpa* in 2 gms quantity each were added either to *Bala Taila* or to *Sahachara Taila* in respective groups.

***Pradhana Karma*: -** The Tip of the catheter is smeared with oil. The anal orifice is lubricated with oil. The catheter is then introduced into the anal canal till 4 - 6 inches. When all the oil is pushed into the rectum, the catheter is gently pulled out.

***Paschat Karma*: -** *Sphik Thadana* is done. The patient is made to lie in the supine position. The patient is made to raise the legs by flexing the hip 3-4 times. *Nagara Dhanyaka Jala* was advised later to sip by sip throughout the day.

OBSERVATION PERIOD: - On the first day before treatment and the last (7th) day after treatment. Both Groups was followed on the 14th Day, 30th Day, 45th and 60th day after the completion of the treatment protocol.

ASSESSMENT CRITERIA

Subjective Parameters: - *Ruk* (pain), *Stamba* (stiffness), *Toda* (pricking sensation), *Tandra* (weakness), *Gaurava* (heaviness), *Aruchi* (anorexia), Sciatica Frequency Index

Objective Parameters: - SLR test and 50 feet walk test

Statistical Method: -Average was found using mean and standard deviation. Pre-test and post-test data were compared using Wilcoxon Signed Rank Test. Comparison of two groups was done using Mann Whitney U Test.

Observation and Result: -In this study maximum number of incidence (29.5%) was in the age groups 41 – 50 and 51 – 60 years and male (61.3%). The majority of the patients had *Vatakapha Prakruthi* (54.5%) and most of the patients were from middle socioeconomic status (61.3%). Maximum patients had *Madyama Vyayama Shakthi* (47.8%). The majority of the patients had chronicity of 0-6 months (31.8%) followed by the chronicity of 13-19 months (22.7%).

RESULTS

Table 1: Statistical analysis of *Ruk.*

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB	2.20	AT	1.10	1.10	50.00%	0.308	0.0688	9.59	<0.05
		AF1	1.10	1.10	50.00%	0.308	0.0688	9.59	<0.05
		AF2	1.00	1.20	54.55%	0.616	0.138	8.72	<0.05
		AF3	0.90	1.30	59.09%	0.657	0.147	8.45	<0.05
		AF4	0.90	1.30	59.09%	0.657	0.147	8.45	<0.05
STMB	2.05	AT	0.95	1.10	53.66%	0.308	0.0688	6.22	<0.05
		AF1	0.80	1.25	60.98%	0.444	0.0993	8.54	<0.05
		AF2	0.80	1.25	60.98%	0.444	0.0993	8.54	<0.05
		AF3	0.90	1.15	56.10%	0.587	0.131	6.84	<0.05
		AF4	0.90	1.15	56.10%	0.587	0.131	6.84	<0.05

The above table denotes that the effect of treatment on *Ruk* was significant (P<0.05) after treatment and after following up in both the groups.

Table 2: Statistical analysis of *Stambha.*

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB	1.20	AT	0.20	1.00	83.33	0.459	0.103	171	<0.001
		AF1	0.10	1.10	91.67	0.553	0.124	171	<0.001
		AF2	0.00	1.20	100	0.616	0.138	171	<0.001
		AF3	0.00	1.20	100	0.616	0.138	171	<0.001
		AF4	0.00	1.20	100	0.616	0.138	171	<0.001
STMB	1.45	AT	0.60	0.85	58.62	0.587	0.131	120	<0.001
		AF1	0.45	1.00	68.97	0.725	0.162	120	<0.001
		AF2	0.45	1.00	68.97	0.725	0.162	120	<0.001
		AF3	0.30	1.15	79.31	0.587	0.131	171	<0.001
		AF4	0.30	1.15	79.31	0.587	0.131	171	<0.001

The above table denotes that the effect of treatment on *Stambha* was highly significant (P<0.001) after treatment and after following up in both the groups.

Table 3: Statistical analysis of *Toda.*

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB	1.60	AT	0.60	1.00	62.50	0.459	0.103	171	<0.001
		AF1	0.40	1.20	75.00	0.616	0.138	171	<0.001
		AF2	0.40	1.20	75.00	0.616	0.138	171	<0.001
		AF3	0.40	1.20	75.00	0.616	0.138	171	<0.001
		AF4	0.50	1.10	68.75	0.718	0.161	136	<0.001
STMB	1.90	AT	0.95	0.95	50.00	0.945	0.211	66	<0.001
		AF1	0.70	1.20	63.16	1.005	0.225	105	<0.001
		AF2	0.60	1.30	68.42	0.923	0.206	136	<0.001
		AF3	0.60	1.30	68.42	0.923	0.202	136	<0.001
		AF4	0.75	1.15	60.53	1.040	0.233	91	<0.001

The above table denotes that the effect of treatment on *Toda* was highly significant (P<0.001) after treatment and after following up in both the groups.

Table 4: Statistical analysis of *Tandra*.

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB	0.30	AT	0.10	0.20	66.67	0.410	0.0918	10	<0.05
		AF1	0.10	0.20	66.67	0.410	0.0918	10	<0.05
		AF2	0.00	0.30	100	0.470	0.105	21	<0.05
		AF3	0.00	0.30	100	0.470	0.105	21	<0.05
		AF4	0.00	0.30	100	0.470	0.105	21	<0.05
STMB	0.35	AT	0.00	0.35	100	0.389	0.109	28	<0.05
		AF1	0.00	0.35	100	0.489	0.109	28	<0.05
		AF2	0.00	0.35	100	0.489	0.109	28	<0.05
		AF3	0.00	0.35	100	0.489	0.109	28	<0.05
		AF4	0.00	0.35	100	0.489	0.109	28	<0.05

The above table denotes that the effect of treatment on *Tandra* was significant (P<0.05) after treatment and after following up in both the groups.

Table 5: Statistical analysis of *Gaurava*.

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB	1.00	AT	0.50	0.50	50	0.688	0.154	36	<0.01
		AF1	0.40	0.60	60	0.681	0.152	55	<0.01
		AF2	0.30	0.70	70	0.923	0.206	55	<0.01
		AF3	0.30	0.70	70	0.923	0.206	55	<0.01
		AF4	0.30	0.70	70	0.923	0.206	55	<0.01
STMB	1.10	AT	0.45	0.65	59.09	0.671	0.150	66	<0.001
		AF1	0.35	0.75	68.18	0.786	0.176	66	<0.001
		AF2	0.20	0.90	81.82	0.718	0.161	105	<0.001
		AF3	0.10	1.00	90.91	0.795	0.178	105	<0.001
		AF4	0.10	1.00	90.91	0.795	0.178	105	<0.001

The above table denotes that the effect of treatment on *Gaurava* was significant (P<0.01) after treatment and after following up in the group BTMB and highly significant (p<0.001) in group STMB.

Table 6: Statistical analysis of *Aruchi*.

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB		AT	0.05	0.15	75	0.366	0.0819	6.00	>0.05
		AF1	0.05	0.15	75	0.366	0.0819	6.00	>0.05
		AF2	0.05	0.15	75	0.366	0.0819	6.00	>0.05
		AF3	0.05	0.15	75	0.366	0.0819	6.00	>0.05
		AF4	0.05	0.15	75	0.366	0.0819	6.00	>0.05
STMB		AT	0.05	0.15	75	0.489	0.109	3.00	>0.05
		AF1	0.05	0.15	75	0.489	0.109	3.00	>0.05
		AF2	0.05	0.15	75	0.489	0.109	3.00	>0.05
		AF3	0.05	0.15	75	0.489	0.109	3.00	>0.05
		AF4	0.05	0.15	75	0.489	0.109	3.00	>0.05

The above table denotes that the effect of treatment on *Aruchi* was significant (P<0.05) after treatment and after following up in both the groups.

Table 7: Statistical analysis of SLR Test

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB	1.00	AT	0.70	0.30	30	0.470	0.105	21	<0.05
		AF1	0.40	0.60	60	0.503	0.112	78	<0.001
		AF2	0.40	0.60	60	0.503	0.122	78	<0.001
		AF3	0.40	0.60	60	0.503	0.122	78	<0.001
		AF4	0.40	0.60	60	0.503	0.122	78	<0.001
STMB	1.0	AT	0.80	0.20	20	0.410	0.094	10	<0.05
		AF1	0.45	0.55	55	0.510	0.117	66	<0.001
		AF2	0.35	0.65	65	0.489	0.112	91	<0.001
		AF3	0.35	0.65	65	0.489	0.112	91	<0.001
		AF4	0.35	0.65	65	0.489	0.112	91	<0.001

The above table denotes that the effect of treatment on SLR Test was significant (P<0.05) after treatment and after following it showed highly significant (P<0.001) in both the groups.

Table 8: Statistical analysis of 50 Foot Walk Test

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB	0.70	AT	0.10	0.60	85.71	0.503	0.115	78	<0.001
		AF1	0.00	0.70	100	0.657	0.151	78	<0.001
		AF2	0.00	0.70	100	0.657	0.151	78	<0.001
		AF3	0.00	0.70	100	0.657	0.151	78	<0.001
		AF4	0.00	0.70	100	0.657	0.151	78	<0.001
STMB	1.05	AT	0.35	0.70	66.67	0.733	0.168	66	<0.001
		AF1	0.25	0.80	76.19	0.696	0.160	91	<0.001
		AF2	0.25	0.80	76.19	0.696	0.160	91	<0.001
		AF3	0.15	0.90	85.71	0.696	0.181	91	<0.001
		AF4	0.15	0.90	85.71	0.696	0.181	91	<0.001

The above table denotes that the effect of treatment on the 50 Foot Walk Test was highly significant (P<0.001) after treatment and after following up in both the groups.

Table 9: Statistical analysis of Sciatica Frequency Index.

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB		AT	5.00	6.20	57.69	1.576	0.352	210	<0.001
		AF1	4.45	6.75	57.69	1.860	0.416	210	<0.001
		AF2	3.85	7.35	69.23	1.981	0.443	210	<0.001
		AF3	3.70	7.50	65.38	1.960	0.438	210	<0.001
		AF4	3.70	7.50	65.38	1.960	0.438	210	<0.001
STMB		AT	5.15	6.10	52.73	1.683	0.376	210	<0.001
		AF1	3.85	7.40	60.00	2.479	0.554	210	<0.001
		AF2	3.40	7.85	63.64	2.796	0.625	210	<0.001
		AF3	3.25	8.00	60.00	3.044	0.681	210	<0.001
		AF4	3.10	8.15	54.55	3.345	0.748	210	<0.001

The above table denotes that the effect of treatment on the Sciatica Frequency Index was highly significant (P<0.001) after treatment and after following up in both the groups.

Table 10: Statistical analysis of S Lanss Pain Score.

Group	Mean Score				%	S.D(±)	S.E(±)	WSRT value	P value
	BT			BT-AT					
BTMB		AT	7.90	5.90	42.75	1.917	0.440	210	<0.001
		AF1	7.30	6.50	47.10	1.606	0.368	210	<0.001
		AF2	6.80	7.00	50.72	2.340	0.537	210	<0.001
		AF3	6.30	7.50	54.35	2.115	0.485	210	<0.001
		AF4	6.30	7.50	54.35	2.115	0.485	210	<0.001
STMB		AT	9.70	6.40	39.75	2.210	0.507	210	<0.001
		AF1	7.25	8.85	54.97	2.540	0.583	210	<0.001
		AF2	6.75	9.35	58.07	3.360	0.771	210	<0.001
		AF3	6.55	9.55	59.32	3.517	0.807	210	<0.001
		AF4	6.25	9.85	61.18	3.843	0.882	210	<0.001

The above table denotes that the effect of treatment on S Lanss Pain Score was highly significant (P<0.001) after treatment and after following up in both the groups.

Table 11: Comparative Effect of Group BTMB and Group STMB.

FETURS	MEDIAN SCOR		MWUT	P
	Group BTMB	Group STMB	value	value
Ruk	1	1	410	>0.05
Sthamba	1	1	437	>0.05
Toda	1	1	419	>0.05
Tandra	1	1	390	>0.05
Gaurava	0	1	389	>0.05
Aruchi	0	0	410	>0.05
SLR test	0	0	430	>0.05
50 Foot walk test	1	1	402	>0.05
Sciatica Frequency index	6	6.5	414	>0.05
S Lanns pain score	5	7	346	>0.05

On comparing the two groups there is no significant difference in the efficacy of treatment seen after treatment and first, follow up and in 2nd, 3rd and 4th follow up showed the significant result in Group STMB at P<0.05.

DISCUSSION

Gridhrasi is one among *Vataja Nanatmaja Vikara* characterised by *Stabdhata* (stiffness), *Vedana* (pain), *Toda* (pricking sensation) in the lumbar region radiating to the lower limb. *Basti* is said to be the best therapy for pacifying aggravated *Vata Dosha*. In this study maximum number of incidences (29.5%) was in the age groups of 41-50 and 51-60 years. This may be occurred due to the progressive *Vata Prakopa* that occurs in this range of *Vaya*[10]. In this study maximum number of patients were found to be Male (62.5%). This could be due to a lower incidence of degenerative changes in premenopausal women[11]. The majority of the patient were belonging to the middle class (62.5%). This might be due to the demographic fact. Most of the patients were shown *Vatakapha Prakrthi*

(55) % and 35% of the patients showed *Vatapitta Prakrthi*. This may suggest that *Vata Prakrthi* individuals are more prone to *Vataja* disease. Most of the patients were shown *Madyama Vyayama Shakthi* ie. 47.5%. This observation shows that the disease condition hampers the daily activity to an extent. The *Bala Taila* process of *Madhura Rasa, Snigdha, Pichila Guna, Vatahara, Balya, Brmhana* and *Vrsya* properties. The researchers showed the pharmacological properties of Sida cardifolia related to *Gridhrasi* includes Analgesic, Anti-inflammatory and Antioxidant[12]. The *Sahachara Taila* process of *Madhura Rasa, Ushna Veerya, Vatahara, Balya* and *Brmhana* properties. Research on Baeleria prionitis shows Analgesic, Anti-inflammatory, Antioxidant and Antinociceptive activities[13]. *Bala Taila* and *Shachara*

Taila have analgesic and antioxidant activity which helps to reduce the pain. *Sahachara Taila* showed a significant effect in the 2nd, 3rd and 4th follow up of S Lanss Pain Score this might be because of the anti-inflammatory and anti-nociceptive activity of *Sahachara Taila.* Both the *Taila* were having the base of *Tila Taila,* which consist of *Vedhanasthapana* action and the pharmacologically which consist of antioxidant, anti-inflammatory, analgesic, anti-cardio, anti-pyretic effect as well as anti-nociceptive action. *Bala Taila* and *Sahachara Taila* have *Madhura Rasa, Snigdha Guna* and *Vatahara* property which helps to reduce *Sthamba. Both Bala Taila and Sahachara Taila* consist of *Balya* and *Brihmana* property, which helps to reduce the weakness of the patients. The *Bala Taila* consist of *Laghu Guna* which helps to reduce the *Gaurava. Sahachara Taila* consists of *Vatakaphahara, Laghu Guna,* and *Ushna Veerya* properties which helps to reduce the *Gaurava.* Both *Bala Taila* and *Sahachara Taila* consist of *Balya and Brihmana* property which helps to give better effect in *the 50* Foot Walk Test. Were in *Vatakaphaja Gridhrasi* consist of *Tandra, Gaurava, Aruchi* features in addition to *Ruk, Toda, and Sthambha. Bala Taila* consist of *Laghu Guna* and *Sahachara Taila* consist of *Vatakapha Hara* property*, Laghu Guna* and *Ushna Veerya* which helps to control the symptoms of *Vatakaphaja Gridhrasi.* The treatment *Matra Basti,* which acts directly on *Vata Sthana* that is *Pakwashaya,* again helps to manage vitiated *Vata Dhosha* thereby controlling the symptoms, produced.

CONCLUSION

It can be concluded that there is a significant effect of both *Bala Taila Matra Basti* and *Sahachara Taila Matra* Basti in *Gridhrasi.* Both the treatments may be considered in treating patients with *Gridhrasi* to reduce both signs and symptoms successfully.

REFERENCES

1. Agnivesha, Charaka Samhitha with Ayurveda Deepika commentary of Chakrapani Datta, edited Vaidya Jadavji Trikamji Acharya, published by Chaukhamba Surabharati Prakashan Varanasi; 2012, Chikitsa sthana.28:46 – 47, pp.787.
2. Agnivesha, Charaka Samhitha with Ayurveda Deepika commentary of Chakrapani Datta, edited Vaidya Jadavji Trikamji Acharya, published by Chaukhamba Surabharati Prakashan Varanasi, reprinted (2015), Siddhi Sthana 1:29, pp. 682.
3. Madhavanidana, by Madhavakara with the commentary of Madhukosha by Vijayarakshithita and Srikanthadatta and with extracts from Atankadarpana by Vachaspativaidya, edited Vaidyajadavajitricumjiacharyachaukamabaorientalia, reprint 2010, vatavyadhi 22:55, pp. 175.
4. Agnivesha, Charaka Samhita, Elaborated by Charaka and Dradabala, with the Ayurvedadipika Commentary edited by Vaidya Jadavaji Trikamji Acharya, Chaukhamba prakashana, reprint 2011 Chikitsa Sthana28:57, pp. 6719.
5. Davidson, Principles, and Practice of Medicine, edited by John A.A. Hunter 20th edition, Neurological Disease, Disordersn of the spine and spinal cord, pp. 1242
6. Agnivesha, Charaka Samhitha with Ayurveda Deepika commentary of Chakrapani Datta, edited Vaidya Jadavji Trikamji Acharya, published by Chaukhamba Surabharati Prakashan Varanasi, reprinted (2015), Chikitsa Sthana 28:101, pp. 621.
7. Atreya, Bhela Samhitha with the English translation of K.H. Krishnamurthy, edited P.V. Sharma published by Chaukhambha Visvabharati, Varanasi, reprint 2008, Chikitsasthana 24:45, pp. 454.
8. Atreya, Bhela Samhitha with the English translation of K.H. Krishnamurthy, edited P.V. Sharma published by Chaukhambha Visvabharati, Varanasi, reprint 2008, Chikitsasthana 24:44, pp. 454.
9. Bhavamisra, Bhavaprakasha Nighantu, of K.C. Chunekar, edited by G.S. Pandey, published by Chaukhambha Bharati Academy, Varanasi, reprint 2006, 142 – 143, pp. 366.
10. Vagbhata. Ashtanga Hridaya with commentaries Sarvanga Sundari of Arunadhatta and Ayurveda Rasayana of Hemadri Chaukambha. Varanasi; Sanskrit Sansthan; 2012. Sutra Sthana 1:8, pp.7.
11. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4858456/
12. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2865797/
13. https://www.wjpr.net/download/article/1521109341.pdf