

A single blind randomized controlled clinical trial of *Munditika churna* adjuvant *Chinna kwath* in the management of *vatarakta* with special reference to Gout

Research Article

Rushikesh S Durkunde^{1*}, Nilesh Dere², Swati Soman³

1. PG scholar, 2. Associate Professor, 3. Professor and HOD, Department of *Kayachikitsa*, SST's Ayurved Mahavidyalaya, Sangamner, Maharashtra. India..

Abstract

Kayachikitsa is First branch of Ashtang ayurveda described by Vagbhatacharya. Samhitas like Charak Samhita, Shushrut, Vagbhat Samhita etc. Vatarakta is described as a disease and symptoms also. *Vatarakta* is a *Sammurchana Janit* (combined) *Vyadhi* of *Vata* and *Rakta*. The aggravated *Vata* is being obstructed in its passage by *Dushit Rakta*. This *Vata* again vitiates the whole *Rakta*. This condition is known as *Vatarakta*. It can be correlated to the Gout disease in modern science due to similar sign and symptoms. *Munditika Churna* has been mentioned in *Chakradutta* and *Bhaishajyaratnavali* is effective in the management of *Vatarakta* and thus selected as a trial drug. *Amrutadi Kwath* Previously tested drug is selected for control group. Aim: To evaluate the clinical efficacy of *Munditika Churna* Adjuvant *Chinna Kwath* in Management of *Vatarakta* w.s.r. to Gout. Materials and Method: A total 70 patients of the age group 20-70 years presenting with signs and symptoms of *Vatarakta* w.s.r Gout were selected randomly from OPD of the department of *Kayachikitsa*. The 35 patients of trial group were treated with *Munditika Churna* Adjuvant *Chinna Kwath* and 35 patients of control group were subjected to *Amrutadi Kwath*. Results: *Munditika Churna* Adjuvant *Chinna Kwath* is effective on *Vatarakta*. Conclusion: *Munditika Churna* is an effective, safe and potent treatment of *Vatarakta* w.s.r. to Gout.

Key Words: *Vatarakta*, Gout, *Munditika Churna*, *Chinna Kwath*, *Amrutadi Kwath*.

Introduction

Ayurveda is an ancient medical science which not only cures the disease but gives healthy lifestyle. *Ayurveda* has 8 branches according to *Acharya Vagbhat*. (1)

Vatarakta is a *Sammurchana Janit* (combined) *Vyadhi* of *Vata* and *Rakta*. (2) The aggravated *Vata* is being obstructed in its passage by *Dushit Rakta*. This *Vata* again vitiates the whole *Rakta*. This condition is known as *Vatarakta*, *Khudavata*, *Vatashonit*, *Vatabalas*, *Adhyavata* etc. It establishes first in the small joints of hands and feet, then spreads in the joints of entire body.

The etiological factors of *Vatarakta* are described in Charak Samhita out of which salty, hot, sour food having high proteins, *Sura*, curd etc. are mainly responsible for *Vataprakopa* and *Rakta Dushti*, the signs and symptoms in the *Vatarakta* like *Kandu*, *Daha*, *Raga*, *Twakvaivarnya*, *Shotha*, *Kara-Padanguli Sandhi*

Vedana and *Paka* are caused by *Dushit Rakta* along with *Tridosha* and the symptoms like *Chankramana kashtata*, *Shool*, *Sandhigraha* caused due to vitiated *Vata* and *Srotorodh*. (3)

In modern medicine, Gouty Arthritis is a complex metabolic disorder of a protein metabolism which results Form deposition of monosodium urate Monohydrate crystals in the joint space causing inflammatory arthritis. *Munditika Churna* has been mentioned in *Chakradutta* and *Bhaishajyaratnavali*. *Mundi Churna* and *Chinna Kwath* are *Raktatag Dosha Pachak*, *Rakta Shodhak*, *Shothahar Srotovibhandha-nashak* and *Vatanashak Dravyas* in *Vatarakta* by removing the obstruction in the path of *Vata* by *Dushit Rakta* and helps in minimizing the severity (4)(5) So, we have decided to use *Munditika Churna* in the management of *Vatarakta*. The study type is randomized controlled clinical study, so *Amrutadi Kwath* Previously tested drug is selected for control group, *Amrutadi Kwath* has been mentioned in *Chakradutta*.

* Corresponding Author:

Rushikesh S Durkunde

PG scholar,
Department of *Kayachikitsa*,
SST's Ayurved Mahavidyalaya, Sangamner,
Maharashtra, India.
Email Id: rushidarkunde@gmail.com

Aim:

To evaluate the clinical efficacy of *Munditika Churna* Adjuvant *Chinna Kwath* in the management of *Vatarakta* w.s.r. to Gout.

Objectives

Primary Objective

To evaluate the clinical efficacy of *Munditika Churna* with *Chinna Kwath* in the management of *Vatarakta* w.s.r. to Gout.

Secondary Objectives

To study in details about *Vatarakta* according to *Ayurvedic* classics

To study the literature related *Munditika Churna* Adjuvant *Chinna Kwath* and *Amrutadi Kwath*.

Materials and methods

A total 70 patients of the age group 20-70 years presenting with signs and symptoms of *Vatarakta* w.s.r. to Gout were selected randomly from OPD of the department of *Kayachikitsa*. The 35 patients of trial group were treated with *Munditika Churna* Adjuvant *Chinna Kwath* and 35 patients of control group were subjected to *Amrutadi Kwath*.

Table 1: Trial Drug: *Munditika Churna* adjuvant *Chinna Kwath*

Drug name	Latin name	Family	Rasa	Virya	Vipak	Guna	Doshaghnata	Part used	Rogaghnata
<i>Munditika</i>	<i>Sphaeranthus indicus</i> Linn.	<i>Asteraceae</i>	Tikta, Katu	Ushna	Katu	Laghu, Ruksha	Tridoshshamak	Panchang	Pandu, Vatarakta, Sleepada
<i>Chinna</i>	<i>Tinospora cordifolia</i> Linn.	<i>Menispermaceae</i>	Tikta, Katu, Kashaya, Katu	Ushna	Madhur	Laghu, Snigdha	Tridoshshamak	Kand	Vatarakta, Kamala, Prameha

Table 2: *Anupana* of *Munditika Churna*

Drug name	Rasa	Virya	Vipak	Guna	Doshaghnata	Rogaghnata
<i>Madhu</i>	Madhur, Kashaya	Sheet	Katu	Ruksha, Lekhan.	Tridoshshamak	Hikka, Visha, Shwas
<i>Sarpi</i>	Madhur	Sheet	Madhur	Guru, Snigdha	Vata-Pittaghna	Vrana, Visarpa, Raktavikar

Kwath Kalpana

Procedure of *kwath kalpana* is explained in *Sharangdhar samhita*, Dry herbs are taken as per the specific traditional *Ayurvedic* formula. the herbs are pounded in to the form of coarse powder made into decoction and it is filtered by cotton cloth.

Control drug: *Amrutadi Kwath*

Amrutadi Kwath is a potent *Ayurvedic* formulation that is prepared from the *Guduchi*, *Shunthi* and *Dhanyak*. The ancient science of *Ayurveda* extensively mentions *Guduchi* in various *Ayurvedic* formulations as it holds a high significance in treating a

multitude of health conditions like fever, gout, fatigue, jaundice, indigestion, and general weakness.

The study type is randomized controlled clinical study, so *Amrutadi Kwath* Previously tested drug is selected for control group, *Amrutadi Kwath* has been mentioned in *Chakradutta*.

Method

Dry herbs are taken as per the specific traditional *Ayurvedic* formula the herbs are pounded in to the form of coarse powder made into decoction, Ratio of the drug to water is fixed. which is then brought down to 1/4th of its original volume by boiling and it is filtered by cotton cloth.

Table 3: Ingredients

Dravya	Latin name	Family	Rasa	Vipak	Virya	Guna	Karmukta	Part used
<i>Amruta</i>	<i>Tinospora cordifolia</i>	<i>Menispermaceae</i>	Tikta Kashaya	Madhur	Ushna	Guru, Snigdha	Raktashodhak, Vataashamak, Deepana	Kanda
<i>Nagar</i>	<i>Zingiber officinal</i> Rosc.	<i>Zingiberaceae</i>	Katu	Madhur	Ushna	Laghu, Snigdha	Shothhar, Vedanasthapana, Vataashaman	Kanda
<i>Dhanyak</i>	<i>Coriandrum sativum</i> Linn	<i>Umbelliferae</i>	Kashaya Tikta Madhur Katu	Madhur	Ushna	Laghu, Snigdha	Tridoshhar, Mutral, Shoolghana	Beeja

Criteria for selection of patients

Diagnostic Criteria (6)

All patients were registered for clinical trial and changes in their clinical manifestations and growing feeling of wellbeing, before and after treatment was collected of selected patients. Patient characterized with following sign and symptoms of *Vatarakta*,

- *Sandhishool* (Pain in Joint)
- *Sandhishoth* (Swelling of Joint)
- *Raga* (Redness)
- *Kandu* (Itching)
- *Vidaha* (Burning Sensation)
- *Tvaka-Vaivarnyata* (Discoloration of skin)
- *Sparsha-Asahishnuta* (Tenderness)
- *Kara-padanguli Sandhi Vedana* (Pain in Small joint)

Patient having elevated serum Uric Acid level more than 8 mg/dl with symptoms of *Vatarakta*.

Screening tests CBC with ESR.

Inclusion criteria

- Patient fulfilling the diagnostic criteria & irrespective of their sex and religion
- Patient who are willing to take treatment for a period of 4 weeks.
- Age group between 20-70 year.

Exclusion criteria

- Patient not willing for clinical trial
- Patient with age of less than 20 and more than 70 years
- Known case of *Vatarakta* associated with any systemic disorder like Diabetes mellitus, Hypertension. Which interferes with present study will be excluded.
- Patient with Pregnancy and lactating mother

Table 4: Assessment criteria

Subjective Parameters	Symptoms	Grade
<i>Sandhishool</i> (7) (Pain in Joint)	No Pain	0
	Mild pain, Pain complained but tolerable	1
	Moderate pain, Pain level interfere with many daily activities	2
	Constant pain, unable to adopt the pain	3
<i>Sandhishotha</i> (8) (Swelling of Joint)	No Swelling	0
	Swelling complained but not apparent	1
	Swelling obvious on 2 joints	2
	Obvious swelling on > 2 joints, Loss of movement.	3
<i>Raga</i> (Redness) (9)	No Redness	0
	Mild redness	1
	Redness with coppery discoloration	2
	Severe redness (discoloration with blackish coppery appearance)	3
<i>Kandu</i> (Itching) (10)	No Burning sensation	0
	Mild burning sensation, tolerable	1
	Moderate burning sensation	2
	Severe burning sensation	3
<i>Vidaha</i> (11) (Burning Sensation)	No Burning sensation	0
	Mild burning sensation, tolerable	1
	Moderate burning sensation	2
	Severe burning sensation	3
<i>Tvaka Vaivarnyata</i> (12) (Discoloration of Skin)	No discoloration of skin	0
	Mild discoloration of skin	1
	Moderate discoloration of skin (Shiny overlying skin)	2
	Severe discoloration of skin (coppery discoloration)	3
<i>Sparsha- Asahishnuta</i> (13) (Tenderness)	No tenderness	0
	Patient say the joint is tender	1
	Patient winces	2
	Patient winces and withdraws the affected part	3
<i>Kara-padanguli Sandhi Vedana</i> (14) (Pain in Small Joint)	No Pain	0
	Mild pain, Pain complained but tolerable	1
	Moderate pain, Pain level interfere with many daily activities	2
	Constant pain, unable to adopt the pain.	3
Objective parameters	Normal Range	
Serum uric acid level	1.5-8 mg/dl	
ESR	For Male 0 to 15 mm/hr; For Female 0 to 20 mm/hr.	

Investigations: CBC, ESR, Serum uric acid level

Duration of treatment: 28 days (4 weeks).

The graded values were later totally and individually scored and assessed statistically to find out the rate of effect of treatment. The age, gender, occupation, habitat wise distribution of patients with socioeconomic status was also recorded and assessed statistically. The effect of treatment in each group was assessed separately by analysing the pre-treatment and post treatment data, scores and values. The comparison of the effect of therapy of two groups done by statistical analysis.

Table 5: Drug Regimen

Subject Type	Group A Trial	Group B Control
No of Patients	35	35
Name of Drugs	Munditika Churna and Chinna Kwath	Amrutadi Kwath
Administration Method	Oral	Oral
Dose	For Munditika Churna- 1 gm BD For Madhu- 1 ml BD For Ghrita- 2 ml BD For Chinna kwath - 20 ml BD	Amrutadi Kwath-20 ml BD
Aushadh Sevan Kala	Vyana, Udana (B.D.P.C.)	Vyana, Udana (B.D.P.C.)
Anupana	For Munditika Churna –Madhu and Ghrita For Chinna Kwath- Jala	Jala
Kalpana	Churna & Kwatha	Kwatha
Duration	28 Days (4 week)	28 Days (4 week)
Indication	Vatarakta w.s.r.to Gout	Vatarakta w.s.r.to Gout
Main reference of Research work	Chakradutta, 23 rd Adhyay, , Vataraktadhikar	Chakradutta, 23 rd Adhyay, Vataraktadhikar

Data thus collected during the study, summarized and statistically analyzed as per protocol.

Table 6: Statistical evaluation of Subjective parameters before treatment and after treatment (Trial group)

Symptoms	Sum of Positive Rank	Sum of Negative rank	W Value	Rs Value	P Value	Sig.
Sandhi shool	0	-630.0	-630.0	0.3440	<0.0001	Yes
Sandhi shotha	0	-630.0	-630.0	0.2274	<0.0001	Yes
Raga	0	-630.0	-630.0	0.1892	<0.0001	Yes
Kandu	0	-630.0	-630.0	0.2764	<0.0001	Yes
Vidaha	0	-630.0	-630.0	0.08423	<0.0001	Yes
Tvak vaivarnya	0	-595.0	-595.0	0.09763	<0.0001	Yes
Sparsha asahishnuta	0	-630.0	-630.0	0.3882	<0.0001	Yes
Kara-padanguli sandhi	0	-630.0	-630.0	0.1065	<0.0001	Yes

- As for all the above factors sum of positive ranks is 0 (zero) which indicates, there wasn't any case in which severity of the symptoms was increased.
- Since the P value is < 0.05, the level of significance for factors Sandhi shool, Sandhi shotha, Raga, Kandu, Vidaha, Tvak vaivarnya, Sparsha asahishnuta, Kara-padanguli sandhi vedana.
- There is strong evidence to reject the null hypothesis for above stated factors.
- So, the effect of therapy is statistically significant on above stated factors.

Table 7: Statistical evaluation of Objective parameters before treatment and after treatment (Trial group)

Criteria	BT Mean	AT Mean	Mean of	S.D. of diff.	t value	P value	Significance
ESR	20.2	14.142	-6.057	1.608	22.29	<0.0001	Yes
Sr. Uric acid	8.64	7.608	-1.031	0.3563	17.13	<0.0001	Yes

- Since the P value is < 0.05, the level of significance for ESR & Sr. Uric acid
- There is strong evidence to reject the null hypothesis for factors stated above.
- So, the effect of therapy is statistically significant on ESR & Sr. Uric acid.

Table 8: Statistical evaluation of Subjective parameters before treatment and after treatment (Control group)

Symptoms	Sum of Positive Rank	Sum of Negative rank	W Value	Rs Value	P Value	Sig.
Sandhi shool	0	-630.0	-630.0	0.1646	<0.0001	Yes
Sandhi shotha	0	-630.0	-630.0	0.4503	<0.0001	Yes
Raga	0	-465.0	-465.0	0.6101	<0.0001	Yes
Kandu	0	-630.0	-630.0	0.5951	<0.0001	Yes
Vidaha	0	-465.0	-465.0	0.5004	<0.0001	Yes

<i>Tvak vaivarnya</i>	0	-496.0	-496.0	0.5271	<0.0001	Yes
<i>Sparsha asahishnuta</i>	0	-351.0	-351.0	0.1488	<0.0001	Yes
<i>Kara-padanguli sandhi vedana</i>	0	-630.0	-630.0	0.5744	<0.0001	Yes

- As for all the above factors sum of positive ranks is 0 (zero) which indicates, there wasn't any case in which severity of the symptoms was increased.
- Since the P value is < 0.05
- There is strong evidence to reject the **null** hypothesis for above stated factors.
- So, the effect of therapy is statistically **significant** on above stated factors.

Table 9: Statistical evaluation of Objective parameters before treatment and after treatment (Control group)

Criteria	BT Mean	AT Mean	Mean of diff.	S.D. of diff.	t value	P value	Significance
ESR	19.685	15.228	-4.457	1.738	15.17	<0.0001	Yes
Sr. Uric acid	8.751	8.202	-0.5486	0.2964	10.95	<0.0001	Yes

- Since the P value is < 0.05, the level of significance for ESR & Sr. Uric acid
- There is strong evidence to reject the null hypothesis for factors stated above.
- So, the effect of therapy is statistically significant on ESR & Sr. Uric acid.

Table 10: Comparative statistical evaluation of Trial group and Control group

Symptoms	Sum of Rank in Trial G	Sum of rank in Control G	U Value	P Value	Sig.
<i>Sandhi shool</i>	1138	1348	507.5	0.1975	No
<i>Sandhi shotha</i>	1255	1231	600.5	0.8248	No
<i>Raga</i>	1020	1465	390	0.0035	Yes
<i>Kandu</i>	1324	1162	531.5	0.2935	No
<i>Vidaha</i>	1227	1259	596.5	0.8476	No
<i>Tvak vaivarnya</i>	1162	1324	531.5	0.2733	No
<i>Sparsha asahishnuta</i>	1033	1453	402.5	0.0074	Yes
<i>Kara-padanguli sandhi vedana</i>	1150	1336	519.5	0.2316	No

- Since the P value is > 0.05,
- So, there is no significant difference in Trial group and Control group if factors *Sandhi shool*, *Sandhi shotha*, *Kandu*, *Vidaha*, *Tvak vaivarnya*, *Kara-padanguli sandhi vedana* are considered except *Raga* & *Sparsha asahishnuta*.

Table 11: Comparative efficacy of therapy on Objective parameters in Trial and Control group - Student Unpaired t test

Criteria	Mean (A) Control Group	Mean (B) Trial Group	Difference between Mean	t value	P value	Sig.
ESR	14.14	15.23	1.086±0.8283	1.314	0.1933	No
Sr. Uric acid	7.609	8.203	0.5943±0.1315	4.519	<0.0001	Yes

- Since the P value is < 0.05, the level of significance for Sr. Uric acid, there is strong evidence to reject the Null hypothesis for above stated factor.
- So, there is significant difference in Trial group and Control group on an average if Sr. Uric acid is considered except ESR.

Results

- There is **significant** effect of *Munditika Churna Adjuvant Chinna Kwath* in the management of *Vatarakta* with special reference to Gout on an average if Subjective & Objective parameters are considered.
- There is **significant** effect of *Amrutadi Kwath* in the management of *Vatarakta* with special reference to Gout on an average if subjective & Objective parameters are considered.
- There is no significant difference in Trial group and Control group if factors *Sandhi shool*, *Sandhi shotha*, *Kandu*, *Vidaha*, *Tvak vaivarnya*, *Kara-padanguli*

sandhi vedana are considered **except** *Raga*, *Sparsha asahishnuta* & ESR.

Discussion

General Observations

Maximum patients were found in age group 33 to 46 yrs (33) and 47 to 63 yrs (30). Gout was found more prevalent in early and middle age group i.e., *Pitta Avastha* of *Vaya*, probably in 3rd and 4th decade. It may be due to dominance of *Pitta* is in middle age and *Vatarakta* is *Rakta (Pitta) Dushti Janya Vyadhi*. Male patients (52) were found maximum. Males were observed more prone to *Vatarakta*. It may be because

Rakta and Vata prakopaka Ahara and Vihara in male was found more. Maximum patients were found having Vata-Pitta (28) and Kapha-Pitta (17) prakriti. Total patients having Vata dosha as at least one of the constituents in prakriti were 46. So, it is Justifiable that Vata-Pitta Prakriti person are easily prone to Vatarakta.

Maximum patients (59) were found having mixed diet. It is clear that mutton, chicken, fish, eggs etc. in diet result in Pitta prakopa and Rakta dushti as well raised Uric acid level which in turn lead to Vatarakta (Gout). Maximum patients found with Manda agni (33) and Vishama agni (23). Vishama agni are more incident in Vata prakriti people respectively. It is narrated in classics that Vata are dominant dosha in samprapti of Vatarakta.

Changes in Subjective and objective parameters before and after treatment

It was observed that Sandhishool (Pain in Joint), Sandhishoth (Swelling of Joint), Raga (Redness), Kandu (Itching), Vidaha (Burning Sensation), Tvaka-Vaivarnyata (Discoloration of skin), Sparsha-Asahishnuta (Tenderness), Kara-padanguli Sandhi Vedana (Pain in Small joint) has decreased in Group A and also in Group B.

It suggests that, Munditika Churna Adjuvant Chinna Kwath is effective to reduce Sandhishool (Pain in Joint), Sandhishoth (Swelling of Joint), Raga (Redness), Kandu (Itching), Vidaha (Burning Sensation), Tvaka-Vaivarnyata (Discoloration of skin), Sparsha-Asahishnuta (Tenderness), Kara-padanguli Sandhi Vedana (Pain in Small joint) in Vatarakta (Gout).

Munditika Churna Adjuvant Chinna Kwath is effective to reduce ESR and Uric acid levels in Vatarakta (Gout). There is significant difference in Trial group and Control group on an average if Sr. Uric acid is considered except ESR.

- There is **significant effect** of Munditika Churna Adjuvant Chinna Kwath in the management of Vatarakta with special reference to Gout on an average if Subjective & Objective parameters are considered.
- There is **significant effect** of Amrutadi Kwath in the management of Vatarakta with special reference to Gout on an average if subjective & Objective parameters are considered.
- There is no significant difference in Trial group and Control group if factors Sandhi shool, Sandhi shotha, Kandu, Vidaha, Tvak vaivarnya, Kara-padanguli sandhi vedana are considered.
- There is significant difference in group A and group B If effect of factor Raga, Sparsha asahishnuta & ESR are considered.

Mode of Action of Munditika Churna Adjuvant Chinna Kwath:

Several formulations have been mentioned for the management of Vatarakta in Ayurvedic classics. In Chakradutta and Bhaishajyaratnavali, Vatarakta Chikitsa Adhyaya mentioned Munditika Churna Adjuvant Chinna Kwath is as like nectar in the

management of Vatarakta. All the ingredients of it are easily available and cost effective.

Munditika, Madhu, Ghrita and Chinna are the four ingredients of this formulation. In Munditika Churna Adjuvant Chinna Kwath maximum ingredients have Rasa-Tikta, Kashaya, Madhur, Virya-Ushna, Vipaka-Katu, Guna-Laghu, Snigdha, Karma - Tridoshaghna, Shothahara, Vedanahara, Dahaprashaman, Raktashodhaka, Shoolaghna, Vranaropaka. So may be effective to control Vatarakta.

Combination of Katu-Rasa & Ushna-Virya Pradhana drugs Munditika Churna with Chinna Kwath is very well indicated due to its Dipana Pachana and Anulomana property, it breaks the Samprapti of Vatarakta.

Conclusion

Munditika Churna Adjuvant Chinna Kwath is more effective, safe and potent treatment of Vatarakta w.s.r. to Gout than Amrutadi kwath.

Scope for further study-

- As the study was included over a small period, a similar study performed over a longer period would have produced much sharper and more accurate results.
- Same treatment given for longer time may give more significant result in lowering Serum Uric Acid level.

References

1. Kaviraj Atridev Gupta, editor, Ashtang Hrudayam of Vagbhata, Sutra Sthana, Ch.1, Ver.5. Reprint ed. Varanasi: Chaukhambha Prakashan;2011. p.5.
2. Yadavaji Trikamji, editor. Charak Samhita of Agnivesha with commentary: Ayurveddipika of Chakrapani, Chikitsa Sthana, Ch.29, Ver.1, Varanasi: Chaukhambha Surbharti Prakashana;2013. p.627.
3. Acharya Vidhyadhar Shukla, Vaidya Ravidatta Tripathi, editor. Charaka Samhita of Agnivesha, Chikitsa Sthana, Ch.29, Ver.16.Reprint ed. Delhi: Chaukhambha Sanskrit Pratishthan;2014. p.716.
4. Pandit Jagannath Sharma Bajpeyee, editor. Chakradatta By Chakrapani Dutta, Ch.23, Ver. 6, Press Bombay; 2006.p.126.
5. Shri Bramhashankar Mishra, editor. Bhaishajya Ratnavali, Chikitsa sthan, Ch.27, Ver. 36, Varanasi: Chaukhambha Prakashan;2018. p.592.
6. Acharya Vidhyadhar Shukla, Vaidya Ravidatta Tripathi, editor. Charaka Samhita of Agnivesha, Chikitsa Sthana, Ch.29, Ver.16-18. Reprint ed. Delhi: Chaukhambha Sanskrit Pratishthan;2014. p.717.
7. <https://www.affirmhealth.com/blog/pain-scales-from-faces-to-numbers-and-verywhere-in-between>, accessed on 6th May 2022.16:34.
8. <https://www.semanticscholar.org/paper/EVALUATION-OF-GUDUCHI-YOGA-IN-THE-MANAGEMENT-OF-A-Huded-Gummadi/77fd9196a31c99b29855328b975968cf8b1da140>, 6th May 2022,18:23.

9. <https://www.semanticscholar.org/paper/EVALUATION-OF-GUDUCHI-YOGA-IN-THE-MANAGEMENT-OF-A-Huded-Gummadi/77fd9196a31c99b29855328b975968cf8b1da140>, 6th May 2022, 14:20.
10. Yadav Sarika, A Small Group Study on The evaluation of effect of Shatavari Ghrita in the management of Vatarakta w.s.r. to Gout. World Journal of Pharmaceutical Research. ISSN 2277-7105, 2017;6(12). p.703-709.
11. <https://www.semanticscholar.org/paper/EVALUATION-OF-GUDUCHI-YOGA-IN-THE-MANAGEMENT-OF-A-Huded-Gummadi/77fd9196a31c99b29855328b975968cf8b1da140>, 6th May 2022, 16:20.
12. Yadav Sarika, A Small Group Study on The evaluation of effect of Shatavari Ghrita in the management of Vatarakta w.s.r. to Gout. World Journal of Pharmaceutical Research. ISSN 2277-7105, 2017;6(12). p.703-709.
13. https://www.academia.edu/35960258/TENDERNESS_GRADING_SOFT_TISSUE_Tenderness_Grading_Soft_Tissue, 6th May 2022, 16:20.
14. <https://www.affirmhealth.com/blog/pain-scales-from-faces-to-numbers-and-everywhere-in-between>, accessed on 6th May 2022, 18:30.
