

Role of Medohara and Rasayana Drugs in the Management of Sandhigatavata

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Abstract

The disease Sandhigatavata is first described by Acharya Charaka in the name of Sandhigataanila with the symptoms of Shotha which on palpation feels as bag filled with air and Shula on prasarana and Akunchana (on flexion and extension). The disease can be compared in modern parlance with osteoarthritis, a degenerative joint disease, the symptoms of which are same as Sandhigatavata and usually occurs after the age of 40 years. In the present study total 42 patients with classical signs and symptoms of sandhigatavata were screened from the O.P.D and I.P.D of Kayachikitsa department, IPGT & RA Hospital, Jamnagar, out of which 6 patients left did not enrolled for the study, remaining 36 patients were divided into 3 groups-

1. Group -R- Only Rasnadi Guggulu - dose- 4 pills three times a day (one pill approx 250 mg) (n=12)
2. Group -GR- Guduchyadi Kashaya (dose- 20 gms twice a day) along with Rasnadi Guggulu (n=12)
3. Group- BR- Bala churna (3 gram three times a day) along with Rasnadi Guggulu (n=12)

Anupana - Warm water

The duration of treatment for all the three groups was 8 weeks. It was concluded that "GR" therapy group shows 74.15% effect on total cardinal signs and symptoms, whereas "BR" and "R" therapy provided 71.60% and 64.11% improvement respectively on total cardinal signs and symptoms of Sandhigatavata.

Keywords: Sandhivata; Osteoarthritis; Rasnadi Guggulu; Guduchyadi kashaya; Bala churna.

Introduction

The disease Sandhigatavata was first described by Acharya Charaka as "Sandhigataanila" with the symptoms of shotha which feels as bag filled with air and shula on prasarana and akunchana.[1] The symptoms mentioned by Acharya Sushruta are shula and shotha leading to diminution of the movement at the joint involved.[2] Osteoarthritis is one of the most common form of arthritis which runs chronic, slowly

progressive course and usually affects almost all weight bearing joints. It is clinically characterized by pain, stiffness and sometimes swelling of the joints. Symptoms of Sandhigatavata are vatapurnadrutishopha, & akunchana prasarana janya vedana described by acharya vagbhatta.[3] According to WHO, osteoarthritis is the second commonest musculoskeletal. Problem in the world population (30%) after backpain (50%).[4] Osteoarthritis is the commonest joint condition.[5] Acharya Charaka has mentioned repeated use of Snehana, Swedana, Vasti and mrudu virechana for the treatment of Vatavyadhi.[6] Osteoarthritis is found more in weight bearing joints i.e Knee joint and obese people are prone to osteoarthritis. Hence in the present study guduchyadi kwath and Rasnadi guggulu was selected due to its medohara and vedanahara properties. Also, the disease is seen in old age and rasayana is described as a part of treatment of Sandhigatavata, hence Bala churna was given in one

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group of patients. Addition of medohara and rasyana drugs is though not described directly as line of treatment of sandhigatavata but rasayana therapy is described in the treatment of vatavyadhies specially chronic in nature. Also medohara drugs are indicated in the management of avritta vata. Hence in the present study both medohara and rasayana drugs were used for management.

Aims and Objectives

1. To study the efficacy of Medohara drug Guduchyadi kwath in the management of sandhigatavata.
2. To assess the role of Rasyana drug Balachurna in the management of Sandhigatavata.

Matierlas and Methods

Patients with below mentioned symptoms of sandhigatavata of age group 30-70 years were selected from the O.P.D and I.P.D of Kayachikitsa department of I.P.G.T &R.A hospital, Jamnagar.

Statistical Analysis

To analysis the effect of therapy statistically, Mean, Percentage, S.D., S.E., t and P values were calculated by using paired 't' test.

Inclusion Criteria

1. Sandhishula (Pain in joints)
2. Sandhishotha (Swelling in joints)
3. Sandhigraha (Stambha)(Stiffness in joints)
4. AkunchanaPrasaranayohVedana(Pain during flexion and extension of joints)
5. SparshaAsahyata (Tenderness)
6. Sandhisphutana(Crepitus)

Exclusion Criteria

1. Patients with other joint diseases such as rheumatoid arthritis, gouty arthritis, joint pain due to other systemic disorders were excluded.
2. Patients of known case of hypertension, diabetes mellitus, cardiac diseases etc were excluded from the study.

Diagnostic Criteria

1. Patients having the signs and symptoms of Sandhigatavata as described in Ayurvedic texts were selected for the clinical trial.

Treatment of all the patients was assessed in the basis of assesment criteria made for the study.

Treatment Groups: In the present study 42 patients were screened out of which 6 patients did not enrolled for the study due to personal reasons. Remaining 36 patients of Sandhigatavata were divided randomly into 3 groups as follows:

- I. *Control Group-R:* Only Rasnadi Guggulu - dose- 4 pills three times a day (one pill approx 250 mg) (n=12)
- II. *Medohara Group-GR:* Guduchyadi Kashaya(dose- 20 gms twice a day) along with Rasnadi Guggulu (n=12)
- III. *Rasayana Group-BR:* Bala churna (3 gram three times a day) along with Rasnadi Guggulu (n=12)

Anupana-Warm Water

The duration of treatment for all the three groups was 8 weeks. no other concomitant medications were allowed with the study participation.

Ingredients of Drugs

- I. Rasnadi guggulu – was prepared based on Yogaratanakar (Vatavyadhi nidanam-1) with

some changes for obtaining better result which are as follows:

Sr no	Ingredients	Parts
1	Rasna	1
2	Devdaru	1
3	Eranda	1
4	Shunthi	1
5	Guduchi	1
6	Shuddha guggulu	5

II. Guduchyadi kashaya-was prepared based on Charaka Samhita[7] (Ch.Su.21/23) with some changes for obtaining better results in treatment of obese patients of sandhigatavata which are as follows:

Sr no	Ingredients	Parts
1	Guduchi	1/2
2	Mustaka	1
3	Vidanga	1
4	Haritaki	1
5	Bibhitaki	1
6	Amalaki	1

III. For Rasyana purpose only Bala Churna was used. Dose- 3gm three times a day.

Criteria for Total Effect of Therapy

- Complete remission - 100% relief in all signs and symptoms along with normal range at joint movement.
- Markedly improved- More than 75% average relief in signs and symptoms.
- Improved - less than 75% average relief in signs and symptoms.
- Unchanged - No change in signs and

symptoms.

- Deterioration - Increase in sign and symptoms or appearance of new symptoms during the treatment .

The effect of treatment on different signs and symptoms were analysed statistically and mean S.D, S.E, and 't' value was calculated as per paired t test.

Observations

Different observations regarding the patients enrolled in the study are as follows:

In the present study, it was found that maximum patients were from the age group of 50-60 years (41.67%), whereas 75% patients were female. In the study 47.22% patients were of Vata-Kaphaj type of prakriti. Maximum number of patients had chronicity less than 1 year (25%) followed by 1-2 years chronicity (22.22). Most of the patients were of weight group 50-60 kgs (30.56%) followed by 60-70 kgs (25%). Negative family history was found in maximum 83.33% patients.

Vishamashana was found in 14 patients (49.89%), Ruksha-sheeta anna was found in 13 patients (36.11%), atikatvadi rasa sevana were detected in 12 patients (38.99%). Atibhara sevana was found in 6 patients (16.60%) and vega samdharana was found in 6 patients (16.11%) patients. Also it was observed that maximum 23 patients (63.89%) patients had history of aggravation of vedana with exertion. Whereas 16.67% (n=6), 11.11% (n=4), 8.33% (n=6) of patients were having history of aggravation with no specific history, amla rasa sevana, sheeta ahara vihara sevana

Sr no	Criteria	No of patients in group			Total	Percentage
		G.R	B.R	R		
1	Age(50-60 yrs)	4	7	4	15	41.67
2	Gender (female)	10	9	8	27	75
3	Prakriti (Vatakapha)	7	4	6	17	47.22
4	Chronicity (less than 1 yr)	3	3	3	9	25
5	Chronicity (2-3yrs)	2	4	2	8	22.22
6	Weight (50-60 kgs)	2	6	3	11	30.56
7	Weight (60-70 kgs)	4	1	4	9	25
8	Family history (Negative)	10	10	10	30	83.33

Table 1: Involvement of Joints-wise Distribution of 36 Patients of Sandhigatavata

Involvement of Joints	No. of Patients			Total	%
	G.R	B.R	R		
Rt. Knee joint	3	2	4	9	25
Lt. Knee joint	3	3	2	8	22.22
Bilateral knee	1	0	1	2	5.56
Bil knee with Hip	2	2	2	6	16.67
Bil knee with shoulder	00	1	1	2	5.56
Bil. Knee with elbow	1	1	1	3	8.33
Bil .knee with ankle	0	2	0	2	5.56
Bil. Knee with hip ,shoulder and ankle	2	1	1	4	11.11

Table 2: Cardinal Symptoms-wise Distribution of 36 Patients of Sandhigatavata

Cardinal Symptoms	No. of Patients			Total	%
	G.R(n)	B.R(n)	R.(n)		
Pain	12	12	12	36	100
Swelling	8	7	7	22	61.11
Morning stiffness	9	7	7	23	63.88
Crepitus	9	8	8	25	69.44
Sa-vedana akunchana Prasarana pravritti	12	12	10	34	94.44
Tenderness	6	6	5	17	47.22
Shrama Asahyta	10	8	9	27	75
Sandhigati hani	6	5	4	15	41.67

respectively.

In the present study, involvement of right knee joint found in maximum number of patients i.e. 25%(Table 1).All the patients (100%) were having pain. Savedana akunchana prasarana pravritti was found in 97.44% patients whereas shramaasahyta was found in 75% patients (Table 2).Kshudha hani was present in 25% patients, whereas aruchi and tandra was found in 16.66% patients respectively (Table 3).

It can be observed that in GR group maximum relief was found in the symptom of Pain i.e 78.37% (Table 4) and in the symptom

of savedana akunchana prasarana maximum relief i.e 77.14% is found in BR group (Table 5).While in R group maximum relief is found in the symptom of pain i.e. 71.42% (Table 6).

In G. R. group 77% relief in gatrashool was found. The effect of therapy of group GR was more in the symptoms of gatrashool and kshudhahani in comparison to other groups (Table 7).Highly significant results in walking time and body weight reduction was also observed in group GR (Table 8).

It can be observed that highly significant results are obtained in walking time in group BR (Table 9) and significant results were

Table 3: Associated Symptoms-wise Distribution of 36 Patients of Sandhigatavata

Associated Symptoms	No. of Patients			Total (n)	%
	G.R (n)	B.R(n)	R.(n)		
Jwara	1	1	2	4	11.11
Aruchi	2	2	2	6	16.66
Gatrashool	1	1	1	3	8.33
Kshudha hani	1	5	3	9	25
Klama	1	1	2	4	11.11
Tandra	3	1	2	6	16.66

Table 4: Effect of Therapy in Cardinal Signs and Symptoms of Sandhigatavata in Group "GR"

Sr no	Cardinal signs and symptoms	Mean score			% relief	t	p
		Mean (\pm S.D) baseline	Mean (\pm S.D) Postinterventional	Difference Mean (\pm S.E)			
1	Pain	3.08	0.66	0.148	78.37	16.25	<0.001
2	Swelling	1.16	0.33	0.207	71.42	4.02	<0.01
3	M.stiffness	1.66	0.41	0.278	75	4.48	<0.001
4	Crepitus	1.75	0.41	0.256	76.19	5.20	<0.001
5	Savedana akunchana prasarana	3.00	0.66	0.142	77.77	16.41	<0.001
6	Tenderness	1.16	0.41	0.250	64.28	3.00	<0.05
7	Shrama asahya	1.83	0.58	0.217	68.18	5.74	<0.001
8	Sandhigati hani	1.16	0.33	0.224	71.42	2.96	<0.05

Table 5: Effect of Therapy in Cardinal Signs and Symptoms of Sandhigatavata in Group "BR"

Sr no	Cardinal signs and symptoms	Mean score			% relief	t	p
		Mean (\pm S.D) baseline	Mean (\pm S.D) Postinterventional	Difference Mean (\pm S.E)			
1	Pain	2.58	0.66	0.418	74.19	12.89	<0.001
2	Swelling	1.16	0.33	0.240	71.42	3.45	<0.01
3	M.stiffness	1.50	0.41	0.334	72.22	3.38	<0.01
4	Crepitus	1.58	0.41	0.270	73.68	4.31	<0.01
5	Savedana akunchana prasarana	2.91	0.66	0.179	77.14	12.53	<0.001
6	Tenderness	1.00	0.41	0.192	58.33	3.02	<0.05
7	Shrama asahya	1.75	0.58	0.246	66.66	4.06	<0.01
8	Sandhigati hani	1.00	0.33	0.256	66.66	2.80	<0.05

Table 6: Effect of Therapy in Cardinal Signs and Symptoms of Sandhigatavata in Group "R"

Sr no	Cardinal signs and symptoms	Mean score			% relief	p
		Base line Mean (\pm S.D)	Postinterventional Mean (\pm S.D)	Difference Mean (\pm S.E)		
1	Pain	1.16 \pm S.D	0.33	0.207	71.42	<0.01
2	Swelling	1.08	0.41	0.158	61.53	<0.01
3	M.stiffness	1.41	0.50	0.259	64.70	<0.01
4	Crepitus	1.50	0.58	0.228	61.11	<0.01
5	Savedana akunchana prasarana	2.16	0.66	0.228	69.23	<0.001
6	Tenderness	1.08	0.50	0.228	53.84	<0.05
7	Shrama asahya	1.75	0.66	0.228	61.19	<0.05
8	Sandhigati hani	0.75	0.25	0.194	66.66	<0.05

Table 7: Effect of Therapy in Associated Signs and Symptoms of Sandhigatavata in Groups (% Relief- Paired T Test)

Associated Symptoms	% relief					
	G.R	P value	B.R	P value	R.	P value
Aruchi	66.66	>0.10	55.55 >0.10		25	>0.10
Gatrashool	77.77	<0.001	67.85	<0.001	33.33	>0.10
Kshudha hani	76.47	<0.001	63.23	<0.05	46.15	>0.05
Klama	54.54	>0.05	33.33	>0.10	16.66	>0.10
Tandra	70	<0.05	28.57	>0.10	66.66	<0.01

Table 8: Effect of Therapy in Walking Time and Body Weight Reduction in Group-GR

Sr no	Parameter	Baseline Mean (±S.D)	Postinterventional Mean (±S.D)	Difference Mean (±S.E)	% relief	t	p
1	Walking time	2.33	0.50	0.016	78.57	9.52	<0.001
2	Body weight	73.08	70.00	0.029	4.21	8.66	<0.001

Table 9: Effect of Therapy in Walking Time and Body Weight Reduction in Group BR

Sr no	Parameter	Baseline Mean (±S.D)	Postinterventional Mean (±S.D)	Difference Mean(±S.E)	% relief	t	p
1	Walking time	2.31	0.51	0.022	77.92	6.75	<0.001
2	Body weight	52.75	53.00	1.144	0.47	8.66	>0.05

Table 10: Effect of Therapy in Walking Time and Body Weight Reduction in Group R

Sr no	Parameter	Baseline Mean (±S.D)	Postinterventional Mean (±S.D)	Difference Mean(±S.E)	% relief	t	p
1	Walking time	2.20	0.80	0.029	63.63	3.92	<0.01
2	Body weight	62.83	62.00	0.047	1.32	1.44	>0.10

obtained in walking time in patients of group R (Table 10).

Results

The effect of above therapies in different groups according to symptoms are as shown below:

Pain: The "GR" and "BR" therapy provided

highly significant ($P<0.001$) relief whereas 'R' therapy provided Significant relief ($P<0.01$)(GR- 78.37%, BR- 74.19%, R- 71.42%)

Swelling- 71.42% relief was found in both GR and BR groups while 61.53% relief was found in R group. The improvement of all three groups were significant ($p<0.01$)

Morning Stiffness: The GR therapy provided highly significant relief ($P<0.001$) while BR and R therapy provided significant

Table 11: Total Effect of Therapy in 36 Patients of Sandhigatavata

Result	No of patients	% relief	No of patients	% Relief	No of patients	% relief
	G.R		B.R		R.	
Complete remission	00	00	00	00	00	00
Markedly improved	06	50	05	41.67	01	8.33
Improvement	06	50	07	58.33	11	91.67
Unchanged	00	00	00	00	00	00
Deterioration	00	00	00	00	00	00

relief($P < 0.01$)(GR- 75%, BR- 72.22%, R- 64.70%)

Crepitus: Highly significant relief ($P < 0.001$) was observed in GRgroup(76.19%) whereas significant ($P < 0.01$) was reported in both BR and R groups.

Savedana Akunchana Prasarana Pravritti: All the three groups shown highly significant relief ($P < 0.001$) in this symptom. (Gr- 77.77%, BR- 77.14%, R- 69.23%)

Tenderness: All the groups provided significant relief in tenderness($P < 0.05$)(Gr- 64.28%, BR- 58.33%, R- 53.84%).

Shrama Asahyta: The GRtherapy showed highly significant relief($P < 0.001$) with 68.18% relief while BR therapy showed significant relief($P < 0.01$) with 66.66% relief and R therapy showed significant relief($P < 0.05$) with 61.19% relief.

Sandhigatihani: All the three groups provided significant relief($P < 0.05$) (GR- 71.42%, BR and R- 66.66% each).

While observing the total effect of therapies, it can be observed that 50% patients of GR group had marked improvement while 50% had improvement which is more in comparison to other therapeutic groups.

Discussion

Sandhigatavata is one among the vatavyadhies which is one of the Mahagada. Usually the onset of symptoms start in 4th decade of life which according to Sushruta is

hani stage of Madhyam vya. The disease may have avarana or dhatu kshaya types of pathogenesis. The disease is twice prevalent in obese patients which may be due to avarana of vata caused by meda as well as kapha. Dushti of vata, meda, asthi and majja are main factors which is generally seen in patients. Therefore the drugs having dhatu pushtikara as well as avaranjarya vataprakopahar properties will be useful for the reversal of samprapti of sandhigatavata due to both types of pathogenesis of vatavyadhi.

Probable Mode of Action

Rasnadi guggulu: The drug showed significant relief in almost all signs and symptoms. Rasna is described as best Vatahara drug.[8]Eranda is also considered as vrushya and vatahara drug.[9] The combination is predominant in Katu-titka rasa(66.66%), laghu guna (50%), tikshna guna and ruksha guna(16.66%each) katu vipaka (50%) and Ushna virya(100%). The above drug with its ushna veerya acts as vatashamaka and owing to its rasa, guna etc it may act on medaavrrita vata which is also a underlying pathology in sandhigatavata.

Guduchyadi Kwatha: The combination is predominant in kashaya rasa (100%)- titka and katu rasa (66.66%) each which may act on accumulation of meda and kapha avarana. With the correction of vitiated vata, the rearrangement of shleshaka kapha may take place and thus the symptoms of Sandhigatihani and stiffness were reduced significantly.

Criteria for Assessment

I. General Symptoms Score:		
Absence of symptoms -		0
Mild degree of symptom-		1
Moderate degree of symptom-		2
Severe symptom-		3
Very severe symptom-		4
1. Specific symptom score:		
1. <i>Vedana (Pain)</i>		
-No Pain		-1
-Occasional little pain on excessive movement or work and relieved after rest.		-2
-Persisting bearable pain on routine work or movement and relieved after rest.		-3
-Persisting unberable pain on routine work or movement relieved after medication.		-4
2. <i>Shotha(Swelling) in joint</i>		
-No Swelling	-	0
-Slight Swelling	-	1
-Moderate Swelling	-	2
-Much Swelling	-	3
3. <i>Morning Stiffness</i>		
-No Stiffness	-	0
- Mild Stiffness	-	1
-Moderate Stiffness	-	2
-Severe difficulty due to Stiffness	-	3
-Severe Stiffness more than 10 minutes	-	4
4. <i>Sparsha-Asahyata(Tenderness)</i>		
- No tenderness	-	0
- Pain on deep pressure without wincing of face	-	1
- Pain on deep pressure with wincing of face	-	2
- Pain on ligh pressure with wincing of face and Withdraws the affected part	-	3
- Does not allow to touch the affected part	-	4
5. <i>AkunchanaPrasaranayohVedana(pain on flexion and extension of the joint)</i>		
- No pain	-	0
- Pain without winching of face	-	1
- Pain with winching of face	-	2
- Shouts & prevents complete flexion	-	3
- Does not allow passive movement	-	4
6. <i>Sandhisphutana (Crepitus)</i>		
- No Crepitation	-	0
- Palpable Crepitation of any one of time during repeated examination	-	1
- Palpable Crepitation during each examination	-	2
- Audible crepitation	-	3
7. <i>Shrama Asahyata:</i>		
- No Shrama asahyata	-	0
- Mild Shrama asahyata	-	1
- Moderate Shrama asahyata	-	2
- Severe Shrama asahyata	-	3
8. <i>Dosha and Dushya score</i>		
- Presence of symptoms before treatment	-	2
- Improvement in symptoms after treatment	-	1
- Absence of symptoms after treatment	-	0
- No change in symptoms after treatment	-	2

The combination has predominantly madhura vipaka (33.33%) and ushna veerya (66.66%) which acts as vatashamaka. Thus owing to above properties both vitiated vata and kapha are subsided leading to relief in signs and symptoms.

Both Guduchyadi kwath and Rasnadi gugglu may act on vitiated kapha and meda which may be beneficial in obese patients of sandhigatavata.

Bala churna: In chronic vatavyadhis dhatuksya may be observed in patients. Rasayana chikitsa is described as a line of treatment in chronic stage of vatavyadhis. [10] Bala churna possess Rasayana, balya and vatashamaka properties. Bala contains madhura rasa, guru- snigdha -picchila guna and madhura vipaka which may probably work as inhibitor for pathogenesis of kshayaja vata vikara as well as hetu pratyani chikitsa of vatavikara. "BR" therapy provided 74.19% relief in pain and 77.14% relief in savedana akunchana prasarana pravritti because bala churna contains galic acid which has significant analgesic action (Baxi *et al* 1988-99). In the pathogenesis of sandhigatavata, weakness of concerned groups of muscles are found. Bala provides bala (strength) to them due to its balya prabhava which may act in degenerative process of the disease.

Conclusion

The study showed that highly significant relief was found in GR group- i.e combination of Guduchyadi kwath and rasnadi guggulu. It is observed that maximum patients registered in the study were obese having Medovardhaka ahara vihara sevana as predominant nidana. Pain was predominant symptom found in all the patients. It can be concluded that medohara treatment is necessary with vaashamaka properties in management of sandhigatavata produced due to avarana type of pathology while in

Dhatukshayajanya sandhigatavata, rasayana and balya treatment may be useful in combination with vatashamaka properties. So, GR therapy was more beneficial in obese patients of sandhigatavata while BR therapy provided better relief in dhatukshayajanya sandhigatavata in comparison to R therapy.

References

1. Agnivesha, Charaka, Dridhabala. Charaka samhita. Chikitsa Sthana, Vatavyadhi Chikitsa Adhyaya, 28/72-74, edited by Y.T Aacharya. 5th edition. Varanasi: Chaukhamba Sanskrit Sansthan; 1990, 618.
2. Sushruta. Sushruta Samhita. Nidanashatana, Vatavyadhinidana Adhyaya, 1/28, translated by Dr Ambikadutta Shastri. 9th edition. New Delhi: Motilal Banarasidas Publications; 2002, 230.
3. Vagbhatta. Ashtanga Hridaya. Nidana sthana, Vatavyadhinidana Adhyaya, 15/14, edited by Kaviraj Atridev Gupta. Varanasi: Chaukhamba Orientalia; 277.
4. Siddharth Kumar Das, Anand N Malaviya. Rheumatology, Osteoarthritis and crystal deposition disease. API textbook of medicine. Edited by SN Shah. Published by The Association of Physicians of India. 7th edition. 2003; 1151.
5. Murray Longmore, Lan B Wilkinson, Supraj Rajagopalan. Rheumatology, Osteoarthritis. Oxford Handbook of Clinical medicine. Edited by Oxford University Press. 6th edition. 2004; 416.
6. Ibidem. Charaka Samhita(1). Vatavyadhi Chikitsa Adhyaya, 28/73-82; 620
7. Ibidem. Charaka Samhita(1). asthouniditiyam adhyaya. 21/22, 117
8. Ibidem. Charaka Samhita(1). yajjahapurushiyam adhyaya. 25/40, 131.
9. Ibidem. Charaka Samhita(1). yajjahapurushiyam adhyaya. 25/40, 131.
10. Ibidem. Charaka Samhita(1). Vatavyadhi Chikitsa Adhyaya. 28/241, 627.