

A Single Armed Clinical Study to Evaluate Efficacy of Navana Nasya with Brihatkalyanaka Ghrita in Apabahuka W.S.R to Frozen Shoulder

Suhasini Biradar¹, Dr. Doddabasayya Kendadamath²

¹PG Scholar, ²Professor & HOD, ^{1,2}Department of Panchakarma,

^{1,2}Taranath Government Ayurvedic Medical College and Hospital, Bellary, Karnataka, India

ABSTRACT

Nasya Karma is a treatment procedure in which the medicine is administered through nostrils. As nose is the gateway of head the medicines administered through it reaches head and spreads through the channels and cures the diseases above shoulder and thus it is specially indicated in Urdwajathrugata Rogas. In Phalasaruthi it is mentioned that the skin, shoulder, neck, face and chest become developed. Apabahuka is a Vatavyadhi in which the vitiated Vata lodges in Amsa pradesha leading to shosha of muscles of that region producing symptoms like Shoola, Bhahupraspandithahara, which disturbs the day to day activities of the individual. Main treatment modality mentioned for Apabahuka is Nasya and Uttarabhakthika Snehapana. Apabahuka is included among the indications of Bruhmana Nasya. Considering the facts, present study was conducted to assess the efficacy of Nasya with Brihatkalyanaka ghrita in Apabahuka. 30 patients of Apabahuka were taken in an open label single group clinical study for nasya with Brihatkalyanaka Ghrita. Results of this study showed that Nasya with Brihatkalyanaka Ghrita was effective in relieving the symptoms of Apabahuka and found statistically significant.

KEYWORDS: Nasya Karma, Navana Nasya, Apabahuka, Brihatkalyanaka ghrita, Frozen Shoulder

INTRODUCTION

Nasya Karma is one of the therapies which is an important Chikitsa for Urdwajathru Rogas¹. In Nasya Phalasaruthi it is mentioned that the skin, shoulders, neck, face and chest become thick, well developed and bright, the body parts and the sense organs become strong and disappearance of grey hairs will be obtained by person who are habituated to nasal medication².

Among the category of diseases our Acharyas have considered Vatavyadhi as an important entity. Apabahuka is one among those Vatavyadhi where vitiated Vata Dosha lodges in Amsa Pradesha and leads to Akunchana of Siras and Shoshana of Amsabandana³. In Madhava Nidana, two conditions have been mentioned Amsasosha and Apabahuka. Amsasosha may be considered as a preliminary stage of disease where loss or dryness of Sleshaka Kapha

occurs and symptoms like Shoola, restricted movements are manifested.

Apabahuka in Western medical science can be correlated to frozen shoulder. It is common but ill understood affliction of Gleno-humeral joint without the radiographic changes: characterised by pain and restriction of all the shoulder movements. It is often said that the pain is often severe enough to disturb the sleep⁴.

Chikitsa Sutra mainly includes Nasya and Uttara baktika Snehapana⁵. Brihatkalyanaka Ghrita⁶ which contains mainly some of jeevaniya gana dravyas, Ksheera and Ghrita as ingredients are having properties of Vatahara and Balya⁷ which can act as Bruhmana over the Shoshana of Amsa Bandana. Therefore this study is undertaken to evaluate whether Brihatkalyanaka Ghrita Nasya is effective in the management of Apabahuka.

How to cite this paper: Suhasini Biradar | Dr. Doddabasayya Kendadamath "A Single Armed Clinical Study to Evaluate Efficacy of Navana Nasya with Brihatkalyanaka Ghrita in Apabahuka W.S.R to Frozen Shoulder" Published in International

Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470,

Volume-6 | Issue-1, December 2021, pp.697-704,

URL: www.ijtsrd.com/papers/ijtsrd47884.pdf



IJTSRD47884

Copyright © 2021 by author(s) and International Journal of Trend in Scientific Research and Development Journal. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0) (<http://creativecommons.org/licenses/by/4.0>)



OBJECTIVES

To evaluate the effect of Nasya with Brihatkalyanaka Ghrita in the management of Apabahuka

MATERIALS AND METHODS:

Clinical Study

30 Patients who fulfil the inclusion criteria in the duration of study period were selected. Each patient was subjected to Nasya Karma with Brihatkalyanaka Ghrita

- Duration - 7 days
- Matra 8 bindus in each nostril in continuous flow (Avichinnadhara)

Diagnostic Criteria

Clinical symptoms of Apabahuka like

- Bahupraspanditahara
- Amsasandhi Shoola
- Amsasandhi Stabdatha

Inclusion Criteria

1. Patients presenting with diagnostic criteria.
2. Patients between the age group of 30-70year
3. Patients fit for Nasya karma.
4. Patients irrespective of sex, occupation, religion, socioeconomic status etc.

Exclusion Criteria

1. Patients of post traumatic injuries.
2. Patients of fracture and dislocation of shoulder joint.
3. Any other systemic illness such as Hypertension and uncontrolled diabetes mellitus(>200mg/dl)
4. Pregnant and lactating women.
5. Patients unfit for Nasya

Investigation

1. Blood investigations- Hb%, TC, DC, ESR, RBS
2. X-ray of affected shoulder joint was done where ever necessary to exclude other joint pathologies like R.A, T.B of bone etc.

Intervention

30 Patients who fulfil the inclusion criteria in the duration of study period were selected. Each patient was subjected to Nasya Karma with Brihatkalyanaka Ghrita

Duration-7 days

Matra - 8 hindus in each nostril in continuous flow (Avichinnadhara)

Procedure

The whole procedure was under three steps, Purva, Pradhana and Pashchat Karma.

Purva Karma

Patients were instructed not to suppress the natural urges and go through the normal routines. Patients were intimated, not to take any food immediately before taking Nasya Karma. Then, patients were taken to a comfortable room, devoid of dust, extreme breeze and sunlight. Abhyanga is done over Jatrurdwa Pradesha with Moorchitha Tila Taila, followed by Bashpa Sweda. Care for Patient's eyes was taken by closing with gauze.

Pradhana Karma

Patients were made to lie down on the table in supine position with legs slightly raised and head slightly lowered. Eyes of the patients were covered with gauze, then the Brihatkalyanaka Ghrita, which was slightly warmed with the help of hot water, was taken in Gokarna and 8 bindhu of Ghrita was instilled into each nostril. The other nostril was closed while administering the medicine. The medicine was instilled slowly as "Avichinnadhara" i.e as a continues stream. The same procedure is repeated in either of the nostrils and care was taken not to shake the head during the procedure. After instilling, soles, neck, palms, ears etc. will be massaged mildly and then patients were asked to turn to sides and spit out the phlegm. After the administration of the medicine, patients were advised not to swallow the medicine but should spit it out. It was done till the smell and taste of the medicine disappears. Then, the patients were allowed to relax in same posture for 100 Matra Kala without going to sleep.

Paschat Karma

Dhumapana with Haridra Choorna and Kavala with Sukoshna Jala were given to the patient. After the Nasya Karma, Patients were advised to Stay in windless place, Drink lukewarm water, Avoid Dust, Avoid Smoke, Avoid Sun shine, Avoid Anger, Avoid Divaswapna.

Assessment Criteria

The assessment is based on the effect of the therapies and will be given suitable scores by application of clinical tools, Samyak Lakshanas of Nasya, changes in signs and symptoms of Apabahuka. Subjective parameters like Bahupraspandahara, Shoola, Sthambha. objective parameters like Amsabandha Sosha, tenderness and range of motion (ROM) including Abduction, Adduction, External Rotation, Internal rotation, Flexion, Extension were assessed by using Goniometer.

GRADES OF ASSESSMENT PARAMETERS**A. SUBJECTIVE PARAMETERS****1. BAHU PRASPANDANAHARA:****Table No: 01) Showing the Gradings for Bahupraspandanahara**

Symptoms	Grade
1) Can do any work without any difficulty	0
2) Can do strenuous work with less difficulty	1
3) Can do minimum work with difficulty	2
4) Cannot do any work	3

2. SHOOLA:**Table No: 02) Showing the Gradings for Shoola**

Symptoms	Grade
1) No pain	0
2) Mild pain & can do strenuous work	1
3) Moderate pain & can do minimum work	2
4) Severe pain & cannot do any work	3

3. STHAMBA:**Table No: 03) Showing the Gradings for Sthamba**

Symptom	Grade
1) No stiffness	0
2) Mild & can lift without support	1
3) Moderate & can lift with support	2
4) Severe stiffness & unable to lift	3

B. OBJECTIVE PARAMETERS:**1. AMSABANDHA SHOSHA:****Table No: 04) Showing the Gradings for Amsabanda Shosha**

Sign	Grade
1) Wasting is absent	0
2) Mild wasting & can move easily	1
3) Moderate wasting & can move with difficulty	2
4) Severe Wasting cannot move	3

2. TENDERNESS:**Table No: 05) Showing the Gradings for Tenderness**

Sign	Grade
1) No complaints	0
2) Patient complains of pain	1
3) Patient complains of pain & tends to pullback.	2
4) Patients complains of pain & withdraws Suddenly	3

C. GONIOMETER ASSESSMENT:**Table No: 06) Showing the Gradings for assessment of joint mobility or range of motions:**

Movements	G0	G1	G2	G3	G4
Abduction	121 ⁰ -150 ⁰	91 ⁰ -120 ⁰	61 ⁰ -90 ⁰	31 ⁰ -60 ⁰	0 ⁰ -30 ⁰
Adduction	105 ⁰ -130 ⁰	79 ⁰ -104 ⁰	53 ⁰ -78 ⁰	27 ⁰ -52 ⁰	0 ⁰ -26 ⁰
Flexion	137 ⁰ -170 ⁰	103 ⁰ -136 ⁰	69 ⁰ -102 ⁰	35 ⁰ -68 ⁰	0 ⁰ -34 ⁰
Extension	49 ⁰ -60 ⁰	37 ⁰ -48 ⁰	25 ⁰ -36 ⁰	13 ⁰ -24 ⁰	0 ⁰ -12 ⁰
Internal rotation	73 ⁰ -90 ⁰	55 ⁰ -72 ⁰	37 ⁰ -54 ⁰	19 ⁰ -36 ⁰	0 ⁰ -18 ⁰
External rotation	73 ⁰ -90 ⁰	55 ⁰ -72 ⁰	37 ⁰ -54 ⁰	19 ⁰ -36 ⁰	0 ⁰ -18 ⁰

STATISTICAL EVALUATION

Statistical analysis was carried out using the graph pad In Stat Software. Test was paired 't' test. Mean score BT, AT and FU, % of relief and 't' was noted, After obtaining 't' value the corresponding 'P' value against particular degree of freedom was noted on the Table of 't'. P value < 0.05 was considered as statistically significant, P < 0.01 very significant, P < 0.001 and P < 0.0001 was considered as extremely significant. P value > 0.05 was considered as statistically insignificant.

OBSERVATIONS AND RESULT

OBSERVATIONS

Table No: 07) Showing the Demographic data

Parameters	Maximum Incidence	No of Patients
Age	40-49 years	11
Sex	Female	16
Socio-Economic status	Middle class	17
Religion	Hindu	23
Occupation	professional	14
Duration of illness	4 -6 months	10
Affected side	right	18
Education	Educated	24
Sleep	disturbed	19
Kosta	Madhyama	18
Malapravrutti	Regular	12
Agni	Mandagni	21
Prakruti	Vatakapha	15
Dosha	Vatakapha	16
Diet	Mixed	16
Satwa	Madhyama	18
Satmya	Madhyama	22
Sara	Mamsasara	15
Samhanana	Madhyama	18
Vyayama Shakti	Madhyama	16

RESULTS

Results were obtained within the group and the data observed in BT (On 0TH Day), AT (On 8th Day) and FU (On 23RD Day) are compared by using Paired 't' test and the effect of treatment is analyzed in each subjective and objective parameters. Statistical analysis was done using the graph pad In Stat software.

Table No: 08, Showing the Comparison of before treatment, after treatment and after follow up time points with status of Bahu Praspandanahara by Wilcoxon matched pairs test

Bahu Praspandanahara	Before treatment	%	After treatment	%	After follow up	%
Can do any work without any difficulty(0)	0	0.00	0	0.00	23	76.67
Can do strenuous work with less difficulty (1)	0	0.00	27	90.00	7	23.33
Can do minimum work with difficulty (2)	16	53.33	3	10.00	0	0.00
Cannot do any work (3)	14	46.67	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.6225, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.3723, p=0.0007*					

*p<0.05

Table No: 09, Comparison of before treatment, after treatment and after follow up time points with status of Shoola by Wilcoxon matched pairs test

Shoola	Before treatment	%	After treatment	%	After follow up	%
No pain(0)	0	0.00	0	0.00	21	70.00
Mild pain & can do strenuous work(1)	0	0.00	25	83.33	9	30.00
Moderate pain & can do minimum work(2)	8	26.67	5	16.67	0	0.00
Severe pain & cannot do any work(3)	22	73.33	0	0.00	0	0.00
Before vs After treatment(4)	Wilcoxon Matched pairs test, Z=4.7030, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.4573, p=0.0007*					

*p<0.05

Table No: 10, Comparison of before treatment, after treatment and after follow up time points with status of Stambha by Wilcoxon matched pairs test

Stambha	Before treatment	%	After treatment	%	After follow up	%
No stiffness (0)	0	0.00	1	3.33	23	76.67
Mild and can lift without support (1)	1	3.33	23	76.67	7	23.33
Moderate pain and can do minimum work (2)	14	46.67	6	20.00	0	0.00
Severe pain and cannot do any work (3)	15	50.00	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7820, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.6225, p=0.0007*					

Table No: 11, Comparison of before treatment, after treatment and after follow up time points with status of Amsabandha Shosha by Wilcoxon matched pairs test

Amsabandha Shosha	Before treatment	%	After treatment	%	After follow up	%
Wasting is absent (0)	8	26.67	15	50.00	30	100.00
Mild wasting & can move easily (1)	7	23.33	15	50.00	0	0.00
Moderate wasting & can move with difficulty	15	50.00	0	0.00	0	0.00
Severe wasting cannot move (3)	0	0.00	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.0145, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.1069, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=3.4077, p=0.0007*					

*p<0.05

Table No: 12, Comparison of before treatment, after treatment and after follow up time points with status of Tenderness by Wilcoxon matched pairs test

Tenderness	Before treatment	%	After treatment	%	After follow up	%
No complaints (0)	0	0.00	3	10.00	27	90.00
Patients Complains of pain (1)	0	0.00	25	83.33	3	10.00
Patient complains of pain and tends to pull back (2)	14	46.67	2	6.67	0	0.00
Patients complains of pain and withdraws suddenly (3)	16	53.33	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.7030, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0007*					

*p<0.05

Table No: 13, Showing the Comparison of before treatment, after treatment and after follow up time points with abduction scores (in degrees) by Wilcoxon matched pairs test

Abduction	Before treatment	%	After treatment	%	After follow up	%
121-150 degrees	0	0.00	0	0.00	2	6.67
91-120 degrees	0	0.00	0	0.00	27	90.00
61-90 degrees	0	0.00	26	86.67	1	3.33
31-60 degrees	26	86.67	4	13.33	0	0.00
0-30 degrees	4	13.33	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7819, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.6225, p=0.0001*					

*p<0.05

Table No: 14, Comparison of before treatment, after treatment and after follow up time points with adduction scores (in degrees) by Wilcoxon matched pairs test

Adduction	Before treatment	%	After treatment	%	After follow up	%
105-130 degrees	0	0.00	0	0.00	11	36.67
79-104 degrees	0	0.00	4	13.33	13	43.33
53-78 degrees	7	23.33	13	43.33	6	20.00
27-52 degrees	8	26.67	13	43.33	0	0.00
0-26 degrees	15	50.00	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.5407, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7030, p=0.0001*					

*p<0.05

Table No: 15, Comparison of before treatment, after treatment and after follow up time points with flexion scores (in degrees) by Wilcoxon matched pairs test

Flexion	Before treatment	%	After treatment	%	After follow up	%
137-170 degrees	0	0.00	0	0.00	17	56.67
103-136 degrees	0	0.00	7	23.33	11	36.67
69-102 degrees	10	33.33	20	66.67	2	6.67
35-68 degree	17	56.67	3	10.00	0	0.00
0- 34 degrees	3	10.00	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.5407, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7030, p=0.0001*					

*p<0.05

Table No: 16, Comparison of before treatment, after treatment and after follow up time points with Extension scores (in degrees) by Wilcoxon matched pairs test

Extension	Before treatment	%	After treatment	%	After follow up	%
49-60 degrees	0	0.00	0	0.00	11	36.67
37-48 degrees	0	0.00	5	16.67	16	53.33
25-36 degrees	7	23.33	19	63.33	3	10.00
13-24 degrees	16	53.33	6	20.00	0	0.00
0-12 degrees	7	23.33	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.6226, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7823, p=0.0001*					

*p<0.05

Table No: 17, Comparison of before treatment, after treatment and after follow up time points with internal rotation scores (in degrees) by Wilcoxon matched pairs test

Internal rotation	Before treatment	%	After treatment	%	After follow up	%
73-90 degrees	0	0.00	0	0.00	6	20.00
55-72 degrees	0	0.00	3	10.00	17	56.67
37-54 degrees	5	16.67	17	56.67	7	23.33
19-36 degrees	15	50.00	10	33.33	0	0.00
0-18 degrees	10	33.33	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.6223, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7822, p=0.0001*					

*p<0.05

Table No: 18, Comparison of before treatment, after treatment and after follow up time points with external rotation scores (in degrees) by Wilcoxon matched pairs test

External rotation	Before treatment	%	After treatment	%	After follow up	%
73-90 degrees	0	0.00	0	0.00	14	46.67
55-72 degrees	0	0.00	6	20.00	9	30.00
37-54 degrees	10	33.33	19	63.33	7	23.33
19-36 degrees	15	50.00	5	16.67	0	0.00
0-18 degrees	5	16.67	0	0.00	0	0.00
Before vs After treatment	Wilcoxon Matched pairs test, Z=4.3724, p=0.0001*					
Before vs After Follow-up	Wilcoxon Matched pairs test, Z=4.7821, p=0.0001*					
After treatment vs After Follow-up	Wilcoxon Matched pairs test, Z=4.4573, p=0.0001*					

*p<0.05

MODE OF ACTION OF NASYA

Nasa is the gateway to Shiras. Brihatkalyanaka ghrita administered through the nose reaches Sringataka Marma which is present in the middle of Siras which give nourishment to Ghrana, Srotra, Akshi and Jihwa. Ghrita spreads in the Moordha and reaches Siramukha of Netra, Karna and Skanda and removes the morbid Doshas present in Urdwa Jatru Pradesha and expels them from Uttamanga.

As the procedure of Nasya involves Moorchitha Tila Taila Abhyanga over Urdwa Jatru Pradesha and Bashpa Sveda it helps in Vatashamana and Dosha Vilayana. Nasya with Brihatkalyanaka Ghrita provides nourishment to the Shiras and Urdwa Jatru Pradesha there by alleviates the vitiated Vata. Hence, it is useful in Vatajanya ailments including Apabahuka.

Mode of Action of Brihatkalyanaka Ghrita

By virtue of its qualities like guru, snigdha teekshna, ushna veerya having properties such as vata shamaka, vedana sthapaka, shoola hara, sadhaneeya, bhalya, bruhmana, shothahara, anulomana, acts on dathukshaya. Most of the ingredients are antagonistic to Vedana Sthapaka and Brimhana helps in reinstilling it to normalcy

DISCUSSION

Indulgence in various etiological factors leads to the accumulation of the Vata Dosha in the Amsapradesha and cause the Shoshana of the Amsabandha and Siraakunchana, which in turn leads to manifestation of Kevala Vataja Apabahuka. Further Kshaya of the Dhatu causes the Prakopa of the Vata and then leads to the Amsa Shosha.

The lipid contents of the Brihatkalyanaka Ghrita may pass through the blood-brain barrier easily due to their transport. Some of the active principles may reach certain levels in the nervous system where they

can exert their Vataghna property. Brihatkalyanaka Ghrita on its nasal administration reaches different Shirogata Indriyas providing Brumhana and Vatashamana effect and there by relieving the symptoms of Apabahuka.

CONCLUSION

Nasya Karma is very easy and effective procedure which can be adopted in treatment of Apabahuka. Brihatkalyanaka Ghrita Nasya can be effectively and safely administered without any adverse effect and is cost effective. Shudhabala Taila having Balya, Vatahara, Bruhmana properties is very much effective in treatment of Apabahuka where there is Shoshana of Amsa Bandana. So it can be concluded that Nasya with Brihatkalyanaka Ghrita can be used as the treatment modality of choice in the management of Apabahuka. Treatment at O.P.D level may also be considered depending on convenience of patient but strict Pathya should be followed.

REFERENCES

- [1] Acharya Vagbhata. Astanga Hridayam, English Translation by SrikanthamurthyKR, Chaukambha Krishnadas Academy, Reprint 2004, Vol-1, SutraSthana, Chapter 20, SI 01, p255.
- [2] Acharya Vagbhata, Astanga Hrudayam, English Translation by Srikanthamurthu KR, Chaukambha Krishnadas Academy, Reprint 2004, Vol-1, Sutra Stana, Chapter 20,SI 20-21, p263.
- [3] Acharya Susrutha, Susrutha Samhita, English Translation by Srikanthamurthu K R, Chaukambha Orientalia, Reprint 2008, Vol-1, Nidana Stana, Chapter 1.SI 82, p471
- [4] en.m.wikipedia.org/wiki/Adhesive_capsulitis_of_shoulder, cited: 11/03/2017

- [5] Acharya Vagbhata, Astanga Hrdayam, English Translation Srikanthamurthy KR, Chaukambha Krishnadas Academy, Reprint 2004, Vol-2, Chikitsa Sthana, Chapter21, S1 44, p505.
- [6] Rajivkumar Rao, Vangasena Samhita, Hindi translation by ramkumar rao. Chaukambha Sanskrit series, Vatavyadhiadhikara S1 No 117, Pg 267
- [7] Acharya Vagbhata, Astanga Hrdayam. Commentary sarvangasundara by arunadatta and ayurvedarasayana of hemadri, Reprint 2010. Uttarasthanam ,Chapter 6, S1 no 34-40, p 799

