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## Research Article

### CLINICAL STUDY ON THE EFFECT OF NASYA & ANJANA KARMA IN THE MANAGEMENT OF KĀCHA WITH SPECIAL REFERENCE TO IMMATURE SENILE CATARACT

K G Surangi<sup>1\*</sup>, Shamsa Fiaz<sup>2</sup>

<sup>1</sup>Postgraduate Department of Shalakya Tantra, National Institute of Ayurveda, Jaipur, Rajasthan, India

<sup>2</sup>Department of Shalakya Tantra, National Institute of Ayurveda, Jaipur, Rajasthan, India

\*Corresponding Author Email: surangikg@gmail.com

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#### ABSTRACT

Third Patalagata Timira is known as Kācha which is characterized by gradual loss of vision and Rāgaprāpta Drishti. In cataract the crystalline lens become coloured due to opacifications and the main feature of immature cataract is gradual diminished vision. Hence 3<sup>rd</sup> Patalagata Timira can be correlated with the Immature Senile Cataract and it is the world's leading cause of blindness affecting an estimated 20 million people; expected to increase to 50 million by the year 2020. Current study was carried out to evaluate the role of Navapatala Varti Anjana, Śatāvaryādi Chūrṇa and Śrīngaverādi Nasya in the management of Kācha. Trial was conducted with 30 patients attending the Shalakya Department of NIA, Jaipur as per the exclusion and inclusion criteria. Assessments were done before (BT) and after (AT) completion of treatment and after the follow up (AF) period with SPSS 2016 and Microsoft Excel 2007. Perturbed vision, blurred distant vision and eye straining got highly significant results and very significant results in blurred near vision, diplopia. Statistically highly significant results were found in PSC & Nuclear types of cataracts and statistically significant in cortical type as compared to BT Vs. AT while PSC achieved highly significant results and other two types got significant results as compared to AT Vs. AF. Chakshushya, Shotahara, Lekhana properties of selected drugs positively affected to reduce the lens opacity and improve the vision. Immature cataract can be successfully and sustainably managed by the selected medicines.

**Keywords:** Navapatala Varti Anjana, Śatāvaryādi Chūrṇa, Śrīngaverādi Nasya

#### INTRODUCTION

Shalakya Tantra is one among the Ashtanga Ayurveda; which deals with diseases occurring above the clavicle specially the sense organs including Eyes, Nose, Ears and Tongue. Eyes hold the superior most position among sensory organs. This was quoted by Vagbhata as for a man without eyes this world is useless because day and night are same for them even if the other sensory organs are healthy. Thus he recommended that all efforts should be performed to protect the eyes throughout life<sup>1</sup>.

Kācha is an important disease which results in gradual diminishing of vision due to colorizing of Drishti (lens/pupillary area). It described under Dṛṣṭigata Rogās which are 12 in number<sup>2</sup>. Any opacity in lens or its capsule is known as cataract which is caused due to degeneration and opacification of the lens fibres or deposition of other materials in the lens as a result of altered physiological changes within its substances<sup>3</sup>.

Cataract is the most leading cause of blindness, both in India (50-80%) as well as on a global scale and the prevalence of cataract in India is three times more than that of US. There are 100 million eyes with cataract causing a vision of <6/60 and 3.8 million people worldwide become blind each year due to cataract<sup>4</sup>. As per the WHO health bulletin 2004 cataract is the world's leading cause of blindness affecting an estimated 20 million people. This is expected to increase to 50 million by the year 2020.

Vagbhata explained Timira, Kācha and Lingānāsha as different diseases<sup>5</sup> which are cause visual disturbances without pain. But

Acharya Sushruta Timira, Kācha and Lingānāsha are taken as three succeeding stages of the same disease<sup>6</sup>. Vagbhata described that the 3<sup>rd</sup> Patalagata Timira as Kācha which is characterized by gradual loss of vision and Rāgaprāpta Drishti (coloured pupillary area)<sup>7</sup>. The characteristic feature of immature cataract is gradual diminished of vision and the crystalline lens also becomes coloured due to opacification. Therefore the 3<sup>rd</sup> Patalagata Timira can be correlated with the Immature Senile Cataract. However Susruta did not mention about any colourization of Drishti in 3<sup>rd</sup> Patalagata Timira. According to Acharya Susruta; when Doshas advanced into the 4<sup>th</sup> Patala; is known as Lingānāsha/Nilikācha. Dalhana commented that colourised Timira occurring in the 3<sup>rd</sup> Patala is Kācha while Lingānāsha is distinguished by the term Nilikācha.

There is no time tested and proven medical treatment in modern science to delay, prevent or reverse the degenerative changes or opacifications in the lens. Allopathic system only recommends several types of cataract surgeries but these are accompanied with several adverse effects and visual acuity may not be recovered to the pre-cataractous stage. Also cataract is a common problem among elderly population with high prevalence rate which disturbs the daily routine. However Ayurvedic system of medicine have been advised to manage Kācha with various types of medicines both systemically and topically and surgery is mentioned in the final stage of Lingānāsha where there is total loss of vision. In this regard Navapatala Varti Anjana topically, Śrīngaverādi Nasya and Śatāvaryādi Chūrṇa orally are selected for the current study.

## AIM

To evaluate the efficacy of Navapatala Varti Anjana, Śrīngaverādi Nasya along with Śatāvaryādi Cūrṇa in the management of Kācha (Immature Senile Cataract).

## MATERIALS AND METHODS

The patients attending the OPD of Shalakya Department of NIA, Jaipur were screened out for clinical signs and symptoms of immature senile cataract and 30 of them were selected for the present study as per the exclusion and inclusion criteria mentioned below. (This trial was conducted with ethical clearance obtained from the Institutional Ethics Committee of NIA, Jaipur, Rajasthan; IEC/ACA/2015/86 dated 21/05/2015)

### Inclusion Criteria

1. Patients between the age group of 45-75 years were selected irrespective of their sex, religion, occupation, caste, social and economic status.
2. The patients having the signs and symptoms of Kācha (signs and symptoms of Immature Senile Cataract).
3. Patients having visual acuity more than 6/9.

### Exclusion Criteria

1. Patients having any fundus pathology causing diminution of vision.
2. Patients having Congenial, developmental, traumatic, complicated, metabolic, mature and hyper mature types of cataract.
3. Patients on prolonged systemic medications.
4. Patients having uncontrolled Diabetes Mellitus, Hypertension etc.

### Drug Administration Procedure

Marsha Nasya has been performed for 7 consecutive days with Śrīngaverādi oil initially and thereafter one Harenu Matra of Navapatala Varti Anjana was applied twice a day mixed with bee honey along with Śatāvaryādi Chūrṇa (5g) orally with hot water twice a day for 45 days. (All the above drugs were prepared in the Pharmacy of NIA, Jaipur)

**Follow up period** – After one month from the date of completion of treatment.

### Assessment criteria

Assessments were done on the basis of following subjective and objective criteria as before treatment (BT), after treatment (AT) and after the follow up period (AF);

**Table 1: Assessment criteria for the subjective parameters**

Criteria	Not affected (0)	Mild (1)	Moderate (2)	Severe (3)
Perturbed vision (Viwhala Darshana)	No perturbed vision	Occasionally present, doesn't disturb daily routine	Frequently present, doesn't disturb daily routine	Frequently present, disturbs daily routine
Eye straining (Netrāyasa)	No feeling of eye straining	Occurs more than 4 hours of near work	Occurs within 2-4 hours of near work	Occurs less than 2 hours of near work
Watering of eyes	No excessive lacrimation	Occasionally present, need not wipe with handkerchief	Frequently present, need to wipe with handkerchief but does not disturb daily routine	Present throughout the day, need to wipe with handkerchief frequently and also disturbing daily routine
Headache (Shirobhitapa)	No headache	Occasionally present and not disturbing daily routine	Frequently present and disturbing daily routine	Present throughout the day, very much disturbing daily routine
Binocular diplopia (Dvididha Darshana)	No diplopia	Occasionally present but does not disturb daily routine	Frequently present but does not disturb daily routine	Frequently present and disturbs daily routine
Glare	Absent	Night time only but does not disturb daily routine	Day time only but does not disturb daily routine	Appears day or night and disturbs daily routine

### Assessment criteria for the objective parameters-

**Table 2: Assessment criteria for the objective parameters**

Criteria	Not affected (0)	Mild (1)	Moderate (2)	Severe (3)
1. Blurred in distant vision (Avyakta Darshana)	No difficulty in distance vision (6/6)	6/9 to 6/12	6/18 to 6/24	More than 6/36
2. Blurred in near vision (Avyakta Darshana)	No difficulty in near vision (N5)	N 6 to N 12	N 18 to N 24	More than N 24

3. Visual acuity with glass (After refraction visual acuity)

- 0 - 6/6
- 1 - 6/9
- 2 - 6/12
- 3 - 6/18
- 4 - 6/24
- 5 - 6/36

4. Iris shadow
  - 0 – Present
  - 1 – Absent
5. Cataract grading
  - 0 - No cataract
  - 1 - Grade I (soft and white, greenish yellow nuclear)
  - 2 - Grade II (soft – medium and yellowish nuclear)
  - 3 - Grade III (medium hard and amber nuclear)
  - 4 - Grade IV (hard and brownish nuclear)
  - 5 - Grade V (ultra hard and blackish nuclear)

(Note – cataract grading has been on the basis of LOCS cataract grading system)

### Statistical analysis

Microsoft Excel 2007 and Special Package for Social Statistics (SPSS) 2016 was used and analysed as BT (Before Treatment), AT (After treatment), SD (Standard Deviation) and SE (Standard Error). There was Statistically Highly Significant results (SHS) –  $p < 0.001$ , Statistically Very Significant (SVS) –  $p < 0.01$ , Statistically Significant (SS) –  $p < 0.05$ , Statistically Not Significant (SNS) –  $p > 0.05$ .

### OBSERVATIONS

The highlighted pre-disposing factors were exposure to direct sunlight (73.33%), exposure to dust (56.67%) and exposure to heat (60%). Majority (93.33%) of patients did not take any treatment before participation in this trial and 70% showed family history related to cataract. Majority of patients (73.33%) did not show any systemic diseases 13.33% of them had history of hypertension and diabetes. None of them showed any past history of ocular diseases affecting vision.

Total 60 eyes of 30 individuals were considered separately for the study. Among those 93.33% eyes presented as immature cataract while 5% with brown cataract and 1.67% had pseudophakic eyes which were not consider for the statistical analysis. Perturbed vision (36.67%), blurred distant vision (100%), blurred near vision (100%) and eye straining (90%) were the observed chief complaints. The associated complaints were watering eyes (33.33%), glare (28.33%), diplopia (23.33%) and headache (33.33%) and almost all the patients showed gradual onset of the disease. Majority of people (83.33%) suffered from Posterior Sub Capsular (PSC 76.67%) type of cataract and the second commonest type was Nuclear cataract (73.33%), 55% had cortical type of cataract. It was observed most of them had more than one type of cataract (mixed type). Highlighted aetiological factors were getting worried (76.67%), headache (46.67%), tempered (50%), taking excessive liquids after meals (33.33%), persistent weeping

(33.33%) day time sleeping (26.67%), elevated pillows (23.33%), hot water head bath (26.67%), dusty environment (26.67%) and occupation with frequent eye straining (23.33%). Among all characteristic features of Vātaja Kāch; 90% patients complained of dusty or smoky appearance of vision and 20% complained of diplopia and sees objects slightly reddish in colour. Majority of 90% people did not show any of the features of Paitika Kācha. When considering characteristic features of Kaphaja Kācha; it was observed that majority of patients 53.33% observed objects as covered by cloth and 20% of them complained of appearance of bright objects as lusterless. None of them showed Tridoshaja type features of Kācha while 26.67% of them saw objects as red or black in colour which is the characteristic feature of Raktaja Kācha. While considering the features of Patalagata Timira; almost all the patients had complaint of 1<sup>st</sup> Patalagata feature i.e. Avyakta Darshana or seeing objects as hazy. Majority 83.33% of them were not able to pass a thread through the eye of a needle and felt darkness in front of eyes, 63.33% had perturbed vision and 46.67% complained of visual hallucinations such as flies, mosquitoes, hairs etc. which are the features of 2<sup>nd</sup> Patalagata Timira. When considering 3<sup>rd</sup> Patalagata Timira almost all the patients suffered from dimness of vision and 36.67% had complained of seeing objects as covered by a cloth and none of them showed any characteristic feature of 4<sup>th</sup> Patalagata Timira.

### RESULTS

In chief complaints as compared to BT Vs AT Perturbed vision, blurred distant vision and eye straining got statistically highly significant results while blurred near vision achieved statistically very significant results (Table 3). When comparison was done between AT Vs. AF; there was no change in perturbed vision and there was statistically highly significant result in eye straining. It was also found that statistically non-significant results in blurred distant vision and blurred near vision (Table 4).

Table 3: Effect on chief complaints as BT vs. AT

Symptoms	Mean		D	% of Change	SD	SE	t	p	Results
	BT	AT							
1. Perturbed vision	0.58	0.17	0.41	70.69	0.5	0.07	5.88	0.000	SHS
2. Blurred distant vision	2.46	1.21	1.25	50.81	0.56	0.08	16.22	0.000	SHS
3. Blurred near vision	2.54	2.42	0.12	4.72	0.32	0.05	2.58	0.01	SVS
4. Eye straining	1.9	1.48	0.42	22.11	0.67	0.09	4.57	0.000	SHS

**Table 4: Effect on chief complaints as AT vs. AF**

Symptoms	Mean		D	% of Change	SD	SE	t	p	Results
	AT	AF							
1. Perturbed vision	0.17	0.17	0	0.00					
2. Blurred distant vision	1.21	1.19	0.02	1.65	0.14	0.02	1	0.322	SNS
3. Blurred near vision	2.42	2.38	0.04	1.65	0.19	0.03	1.43	0.159	SNS
4. Eye straining	1.48	0.5	0.98	66.22	0.96	0.13	7.37	0.000	SHS

As compared to BT and AT, watering of eyes showed statistically highly significant results, headache and binocular diplopia got statistically very significant results and glare had statistically significant results (Table 5) which were the

associated complaints. When compared between AT vs. AF (Table 6); watering of eyes and glare had statistically non-significant results while headache and binocular diplopia had constant results.

**Table 5: Effect on other complaints as BT vs. AT**

Symptoms	Mean		d	% of Change	SD	SE	t	p	Results
	BT	AT							
1. Watering of eyes	0.47	0	0.47	100.00	0.77	0.11	4.29	0.000	SHS
2. Glare	0.28	0.14	0.14	50.00	0.5	0.07	1.99	0.05	SS
3. Headache	0.43	0	0.43	100.00	0.68	0.12	3.5	0.002	SVS
4. Binocular diplopia	0.3	0.1	0.2	66.67	0.41	0.7	2.7	0.01	SVS

**Table 6: Effect on other complaints as AT vs. AF**

Symptoms	Mean		d	% of Change	SD	SE	t	p	Results
	AT	AF							
1. Watering eyes	0.04	0.02	0.02	50.00	0.32	0.05	0.44	0.659	SNS
2. Glare	0.14	0.16	-0.02	-14.29	0.32	0.05	-0.44	0.659	SNS
3. Headache	0	0	0	0.00					
4. Binocular diplopia	0.1	0.1	0	0.00					

In objective parameters, Visual acuity with glass, cataract grading in nuclear and PSC types showed statistically highly significant results while cortical type of cataract showed statistically significant results and no changes were seen in iris shadow (Table 7) On comparison of AT Vs. AF of objective

parameters (Table 8) showed statistically highly significant results in visual acuity and PSC type of cataract and statistically significant results in nuclear and cortical type of cataracts. However there was no statistical change in iris shadow.

**Table 7: Effect on objective parameters as BT vs. AT**

Objective parameters	Mean		d	% of Change	SD	SE	t	P	Results
	BT	AT							
Visual acuity with glass	2.38	0.89	1.49	62.61	1.15	0.16	9.59	0.000	SHS
Iris shadow	1	1	0	0.00					
<b>Cataract grading</b>									
Nuclear	1.09	0.88	0.21	19.27	0.41	0.06	3.69	0.001	SHS
PSC	1.75	0.88	0.87	49.71	0.59	0.08	10.72	0.000	SHS
Cortical	0.85	0.77	0.08	9.41	0.27	0.04	2.06	0.044	SS

**Table 8: Effect on objective parameters AT vs. AF**

Objective parameters	Mean		d	% of Change	SD	SE	t	P	Results
	AT	AF							
Visual acuity with glass	1.48	0.63	0.85	57.43	1.26	0.17	2.1	0.000	SHS
Iris shadow	1	1	0	0.00					
<b>Cataract Grading</b>									
Nuclear	0.91	0.82	0.09	9.89	0.29	0.04	2.32	0.024	SS
PSC	1.39	0.95	0.44	31.65	0.69	0.09	4.87	0.000	SHS
Cortical	1	0.88	0.12	12.00	0.38	0.05	2.43	0.018	SS

All the spectacle power parameters received statistically non-significant results in BT vs. AT. (Table 9). As compared to AT Vs. AF myopic spherical power, hypermetropic spherical and

cylindrical power did not show any statistical changes. Hence these spectacle powers were constant or stable after the trial period (Table 10).

Table 9: Effect on Spectacle Power as BT vs. AT

Objective parameters	Mean		d	% of Change	SD	SE	t	P	Results
	BT	AT							
Myopic Spherical	-1.96	-1.81	-0.15	7.65	0.39	0.08	-1.99	0.058	SNS
Myopic Cylindrical	-1.26	-1.09	-0.17	13.49	0.57	0.14	-1.27	0.221	SNS
Hypermetropic Spherical	0.87	0.64	0.23	26.44	0.62	0.12	1.89	0.070	SNS
Hypermetropic Cylindrical	0.14	0.14	0	0.00	0.17	0.03	1	1.000	SNS
Presbyopic Correction	2.42	2.39	0.03	1.24	0.2	0.03	1.34	0.185	SNS

Table 10: Effect on Spectacle Power as AT vs. AF

Objective parameters	Mean		d	% of Change	SD	SE	t	P	Results
	BT	AT							
Myopic Spherical	-1.83	-1.83	0	0.00					
Myopic Cylindrical	-1.09	-0.84	-0.25	22.94	1.03	0.25	-1	0.332	SNS
Hypermetropic Spherical	0.58	0.58	0	0.00					
Hypermetropic Cylindrical	1.35	1.35	0	0.00					
Presbyopic Correction	2.39	2.37	0.02	2.35	0.09	0.01	1.43	0.159	SNS

## DISCUSSION

Nasya Karma was performed with Śrīngaverādi oil which is a Snehana type Nasya or Navana<sup>8</sup> or Shirovirechana Nasya<sup>9</sup> before the administration of Anjana; as Pūrva Karma to promote Nirāma Avastha in eyes. Nasya Karma is helpful in expelling all the vitiated Doshas which are located in the regions above the clavicle (Urdhavajatrugata) completely<sup>10</sup>. Hence it is beneficial for the purification of head and all the organs located in the head; which create a Nirāma status of eyes as well. Śrīngaverādi Nasya contains Kapha - Vāta Shamaka and Chakshushya ingredients like Śrīngavera, Bhrīngarāja, Madhuyashti and Sesame oil. Kācha can be taken as 3<sup>rd</sup> Patalagata Timira and Timira itself is a Vātaja disease. Signs and symptoms of immature cataract can be compared with Kaphaja Kācha. Śrīngaverādi Nasya is indicated for Patala Roga in authentic text of Chakradatta<sup>11</sup>. Hence it can be said that Śrīngaverādi Nasya can be adopted in the treatment of Kācha and it may be useful in improvement of vision due to Chakshushya properties of ingredients.

Navapatala Varti Anjana<sup>12</sup> contains both the mineral and herbal ingredients (total 23 drugs) including drugs such as rock alum, calamine, rock salt, asbestos, *Glycyrrhiza glabra*, *Cuminum cyminum*, *Piper longum*, *Picrorhiza kurroa*, *Eclipta elba*, *Vitex negundo* etc. It contains 21.7% of Shotahara drugs and 56% of Kaphavāta Shamaka drugs, 63.6% Ushana Virya drugs, 61.9% Katu Vipaka Dravyas 75% and 45% of Katu and Tikta Rasa drugs, respectively and 28.5% of Ruksha drugs. Lens contains 65% of water in its relatively dehydration stage (normal stage) but in immature cataractous stage it will be increased to about 68-70% and in hypermature morgagian stage about 78-80%<sup>8</sup>. Therefore hydration of lens matter is one of the leading cause of cataract. Hence medicinal properties of Navapatala Varti Anjana may reduce the hydration of lens matter and may reverse the cataract formation in initial stages. Also it contains 8.7% of Lekhana ingredients which is helpful in clearing opacification of lens fibres and the presence of 39% of Chakshushya drugs may positively act on visual acuity.

Śatāvaryādi Cūrṇa<sup>13</sup> is indicated for Timira, Kācha, Patala and blurred vision (smoky) in Yogaratnakara<sup>8</sup>. It contains 83% of Madhura and 67% of Tikta Rasa drugs, 67% of Madhura Vipaka drugs, 50 % of Kaphavata Shamaka and Tridosha Shamaka drugs, 33% of Chakshushya and Rasayana drugs.

Most of the chief complaints achieved statistically highly significant results in i.e. Perturbed vision, blurred distant vision, eye straining with the p value of 0.00 due to above described medicinal properties of the drug. There were statistically highly significant results in watering of eyes, statistically very significant results in binocular diplopia and headache, and significant results in glare. The grading system of cataract is the most important part of the study. In that statistically highly significant results were found in Posterior Subcapsular (PSC) and Nuclear type of cataracts while cortical type of cataract received statistically significant results as compared to BT Vs. AT. Also it was observed statistically highly significant results in PSC type and statistically significant results in cortical and nuclear types of cataracts after the follow-up period. Therefore these results show sustainable and positive impact on reducing or delaying lens opacification. However no statistical change was seen on iris shadow and hence 100% relief in cataract was not achieved.

## CONCLUSION

As per the observed signs and symptoms among the six varieties of Doshaja Timira, Kācha and Lingānāsha are the signs and symptoms of Kaphaja Kācha can be correlated with immature cataract as Drishti appears white in colour and one perceives objects as if covered by a cloth or of hazy appearance. In this study Anjana Karma was performed after the Nasya Karma; which is advised in authentic classics for better purification of eyes as well as head. Hence current study received statistically proven positive longstanding or sustainable results in the disease cataract. Navapatala Varti Anjana may affect the hyper hydration of lens matter, reduce the opacification and also it promotes improvement of vision due to its medicinal properties while Śatāvaryādi Cūrṇa may be helpful in promoting the visual acuity. Finally it can be concluded that all the medicines

selected were highly effective and gave better, sustainable results on immature cataract.

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