AYUSHDHARA
ISSN: 2393-9583 (P)/ 2393-9591 (O)
An International Journal of Research in AYUSH and Allied Systems

Research Article

ADD-ON EFFECT OF *KULATHA YUSHA* AND CLINICAL YOGA PROTOCOL IN *VATAJA PRATISHYAYA* WITH SPECIAL REFERENCE TO ALLERGIC RHINITIS - A COMPARATIVE CLINICAL TRIAL

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Article info

Article History:

Received: 20-09-2025

Accepted: 18-10-2025

Published: 30-11-2025

KEYWORDS:

Allergic Rhinitis, *Vataja Pratishyaya, Kulatha yusha.*

ABSTRACT

Allergic Rhinitis is an IgE mediated immunological response of nasal mucosa to airborne allergens and is characterized by watery nasal discharge, nasal obstruction, sneezing and itching in the nose. The symptoms are closely related with *Vataja Pratishyaya*. *Pratishyaya* is one among the *Viruddha aharajanya roga* mentioned by *Caraka*. Hence dietary modification can be useful in reducing allergic rhinitis symptoms. *Kulatha yusha* is one among the dietary preparations mentioned in *Nasa roga pratishedha adhyaya* of *Ashtanga Hrdaya*, and *Kulatha yusha* is indicated in *Pinasa* as well. Clinical yoga training is also proven to lower allergic rhinitis symptoms and to improve the quality of life. Considering these factors as improving allergic rhinitis symptoms, the present study is to compare the add on effect of *Kulatha yusha* and clinical yoga protocol in the subjective and objective parameters of participants with allergic rhinitis receiving *Haridra khanda* against the group receiving *Haridra khanda* alone. The subjective parameters in study group showed statistically significant result when compared to control group ($p<0.05$) but a statistically insignificant result was obtained for objective parameters in the study group when compared with the control group. Hence *Kulatha yusha* and clinical yoga protocol has an add on effect in the subjective parameters of participants receiving *Haridra khanda* when compared to participants receiving *Haridra khanda* alone. Also, *Kulatha yusha* and clinical yoga protocol has no add on effect in the objective parameters of participants receiving *Haridra khanda* when compared to participants receiving *Haridra khanda* alone.

INTRODUCTION

Allergic Rhinitis is a symptomatic disorder of the nose induced after allergen exposure by an immunoglobulin E (IgE) mediated inflammation of the membranes lining the nose.[1] Allergic Rhinitis is characterised by one or more symptoms including sneezing, itching, nasal congestion and rhinorrhoea. Many causative agents have been linked to Allergic Rhinitis including pollens, molds, dust mites and animal dander.[2]

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Quick Response Code	
	https://doi.org/10.47070/ayushdhara.v12i5.2322

It has a marked impact on quality of life, socially, at school and in the workplace and is a huge socio- economic burden,[3] and it is identified as one of the top ten reasons for visits to primary care clinics.[4] Based on similarities in etiological factors and Clinical features, allergic rhinitis may be correlated with *Vataja Pratishyaya* in the context of Ayurveda.[5]

In *Ashatnga hrdaya uttarasthana, nasa roga pratishedha adhyaya, Kulatha yusha* is explained.[6] And *Kulatha yusha* is indicated in *Pinasa* as well.[7] *Yoga* reduces the symptoms of allergic rhinitis,[8] hence *yoga* therapy can be in cooperated as an adjuvant therapy in allergic rhinitis. Its worthy to investigate the role of diet and yoga in treating allergic rhinitis supplemented along with *Haridra khanda.* So, this study is intended to evaluate the add on effect of *Kulatha yusha* and Clinical

Yoga Protocol in *Vataja Pratishyaya* with special reference to allergic rhinitis receiving *Haridra khanda*.

OBJECTIVE

- To compare the add on effect of *Kulatha yusha* and Clinical Yoga Protocol along with *Haridra khanda* in the subjective parameters of participants having *Vataja Pratishyaya* with special reference to allergic rhinitis against the group receiving *Haridra khanda* alone.
- To compare the add on effect of *Kulatha yusha* and Clinical Yoga Protocol along with *Haridra khanda* in the objective parameters of participants having *Vataja Pratishyaya* with special reference to allergic rhinitis against the group receiving *Haridra khanda* alone.

MATERIALS AND METHODS

Research design - Comparative clinical trial

Method of data collection

Sample size

The sample for the study was considered as 17 in each group.

Sampling procedure: A comparative clinical trial was designed, 17 participants each satisfying the exclusion and inclusion criteria was selected for both study and control group. Cases were be diagnosed using diagnostic guidelines of American academy of Otolaryngology along with a positive AEC and serum IgE values and will be allotted into two groups. *Haridra khanda* was given to both groups and *Kulatha yusha* morning 8 am after food and 45 minutes of Clinical yoga practice for one month was advised for study group. Subjective parameters will be assessed on 0th day, 31st day, 45th day and objective parameters will be assessed on 0th day and 31st day.

Selection of sample

Diagnostic Criteria

- Participants with 1 or more of 4 cardinal symptoms of allergic rhinitis (watery rhinorrhea, nasal obstruction, nasal itching, sneezing).
- AEC more than 440 IU
- Serum IgE more than 200 IU

Inclusion criteria

- Participants fulfilling diagnostic criteria.
- All gender aged between 18-55 years.
- Willing to give informed consent.

Exclusion criteria

- Persons with history of other respiratory diseases like bronchial asthma, COPD, pneumonia.
- Those under medication for allergic rhinitis.
- Those suffering from *Amlapitta*.
- Smokers
- Known cases of systemic illnesses (CVD, hypertension, gout).
- Pregnancy and lactation.

Assessment criteria

All participants were analyzed for their demographic profile like age, sex, marital status etc.

Data on attrition: There were 3 dropouts among participants, 1 each from trial group and 2 from control group. Per protocol analysis was followed and the results calculated based on this is given further.

Assessment

Grading of signs and symptoms of *Vatika Pratishyaya*

A. Ayurvedic severity of symptoms assessment scale	
1. *Kshavathu*	Cured (Absent) – 0 Moderate Improvement (Present only during exposure) – 1 Mild Improvement (Present only in morning and evening) – 2 No Change (Present throughout the day) - 3
2. *Tanusrava*	
3. *Shhirashoola*	
4. *Galashosha*	
5. *Nistoda shanka*	
6. *Swarabheda*	
B. Assessment scale based on severity and total nasal symptoms	
1. Rhinorrhea	Cured (Absent) – 0 Moderate improvement (Moderate awareness but not troubled)– 1 Mild improvement (Mild troublesome but not interfering with normal activities or sleep) – 2 No change (Severe & interfering with normal daily activities or sleep) - 3
2. Nasal itching	
3. Nasal obstruction	
4. Sneezing	

OBSERVATIONS

***Kshavathu* (Sneezing)**

Kshavathu		Group				Total	
		Study		Control			
		N	%	N	%	N	%
15th day	Mild improvement	14	87.5%	2	13.3%	16	51.6%
	No change	2	12.5%	13	86.7%	15	48.4%
31st day	Cured (100%)	7	43.8%	0	0.0%	7	22.6%
	Moderate improvement	7	43.8%	0	0.0%	7	22.6%
	Mild improvement	2	12.5%	8	53.3%	10	32.3%
	No change	0	0.0%	7	46.7%	7	22.6%
45th day	Cured (100%)	13	81.3%	0	0.0%	13	41.9%
	Moderate improvement	3	18.8%	1	6.7%	4	12.9%
	Mild improvement	0	0.0%	12	80.0%	12	38.7%
	No change	0	0.0%	2	13.3%	2	6.5%
Total		16	100.0%	15	100.0%	31	100.0%

***Tanusrava* (Rhinorrhoea)**

Tanusrava		Group				Total	
		Study		Control			
		N	%	N	%	N	%
15th day	Cured (100%)	2	12.5%	0	0.0%	2	6.5%
	Moderate improvement	2	12.5%	0	0.0%	2	6.5%
	Mild improvement	10	62.5%	5	33.3%	15	48.4%
	No change	2	12.5%	10	66.7%	12	38.7%
31st day	Cured (100%)	6	37.5%	1	6.7%	7	22.6%
	Moderate improvement	6	37.5%	0	0.0%	6	19.4%
	Mild improvement	4	25.0%	8	53.3%	12	38.7%
	No change	0	0.0%	6	40.0%	6	19.4%
45th day	Cured (100%)	10	62.5%	1	6.7%	11	35.5%
	Moderate improvement	6	37.5%	0	0.0%	6	19.4%
	Mild improvement	0	0.0%	12	80.0%	12	38.7%
	No change	0	0.0%	2	13.3%	2	6.5%
Total		16	100.0%	15	100.0%	31	100.0%

***Shirashoola* (Headache)**

Shirashoola		Group				Total	
		Study		Control			
		N	%	N	%	N	%
15th day	Cured (100%)	1	6.3%	0	0.0%	1	3.2%
	Mild improvement	8	50.0%	4	26.7%	12	38.7%
	No change	7	43.8%	11	73.3%	18	58.1%
31st day	Cured (100%)	6	37.5%	0	0.0%	6	19.4%

	Moderate improvement	2	12.5%	1	6.7%	3	9.7%
	Mild improvement	2	12.5%	5	33.3%	7	22.6%
	No change	6	37.5%	9	60.0%	15	48.4%
45th day	Cured (100%)	10	62.5%	1	6.7%	11	35.5%
	Mild improvement	0	0.0%	5	33.3%	5	16.1%
	No change	6	37.5%	9	60.0%	15	48.4%
Total		16	100.0%	15	100.0%	31	100.0%

***Galashosha* (Dryness of throat)**

Galashosha		**Group**				**Total**	
		Study		**Control**			
		N	**%**	**N**	**%**	**N**	**%**
15th day	Moderate improvement	1	6.3%	0	0.0%	1	3.2%
	Mild improvement	3	18.8%	2	13.3%	5	16.1%
	No change	12	75.0%	13	86.7%	25	80.6%
31st day	Cured (100%)	4	25.0%	0	0.0%	4	12.9%
	Mild improvement	0	0.0%	5	33.3%	5	16.1%
	No change	12	75.0%	10	66.7%	22	71.0%
45th day	Cured (100%)	4	25.0%	1	6.7%	5	16.1%
	Mild improvement	0	0.0%	5	33.3%	5	16.1%
	No change	12	75.0%	9	60.0%	21	67.7%
Total		16	100.0%	15	100.0%	31	100.0%

***Nistoda shanka* (Pain in temporal region)**

Nistoda shanka		**Group**				**Total**	
		Study		**Control**			
		N	**%**	**N**	**%**	**N**	**%**
15th day	Cured (100%)	1	6.3%	0	0.0%	1	3.3%
	Mild improvement	9	56.3%	4	28.6%	13	43.3%
	No change	6	37.5%	10	71.4%	16	53.3%
31st day	Cured (100%)	4	25.0%	0	0.0%	4	13.3%
	Moderate improvement	4	25.0%	1	7.1%	5	16.7%
	Mild improvement	2	12.5%	5	35.7%	7	23.3%
	No change	6	37.5%	8	57.1%	14	46.7%
45th day	Cured (100%)	9	56.3%	1	7.1%	10	33.3%
	Moderate improvement	1	6.3%	0	0.0%	1	3.3%
	Mild improvement	0	0.0%	5	35.7%	5	16.7%
	No change	6	37.5%	8	57.1%	14	46.7%
Total		16	100.0%	14	100.0%	30	100.0%

***Swarabheda* (Hoarseness of voice)**

Swarabheda		Group				Total	
		Study		Control			
		N	%	N	%	N	%
15th day	Moderate improvement	1	6.3%	0	0.0%	1	3.2%
	Mild improvement	3	18.8%	0	0.0%	3	9.7%
	No change	12	75.0%	15	100.0%	27	87.1%
31st day	Cured (100%)	3	18.8%	1	6.7%	4	12.9%
	Moderate improvement	1	6.3%	0	0.0%	1	3.2%
	Mild improvement	0	0.0%	3	20.0%	3	9.7%
	No change	12	75.0%	11	73.3%	23	74.2%
45th day	Cured (100%)	4	25.0%	2	13.3%	6	19.4%
	Mild improvement	0	0.0%	2	13.3%	2	6.5%
	No change	12	75.0%	11	73.3%	23	74.2%
Total		16	100.0%	15	100.0%	31	100.0%

Rhinorrhoea

Rhinorrhoea		Group				Total	
		Study		Control			
		N	%	N	%	N	%
15th day	Cured (100%)	2	12.5%	0	0.0%	2	6.5%
	Moderate improvement	2	12.5%	0	0.0%	2	6.5%
	Mild improvement	10	62.5%	5	33.3%	15	48.4%
	No change	2	12.5%	10	66.7%	12	38.7%
31st day	Cured (100%)	6	37.5%	1	6.7%	7	22.6%
	Moderate improvement	6	37.5%	0	0.0%	6	19.4%
	Mild improvement	4	25.0%	8	53.3%	12	38.7%
	No change	0	0.0%	6	40.0%	6	19.4%
45th day	Cured (100%)	10	62.5%	1	6.7%	11	35.5%
	Moderate improvement	6	37.5%	0	0.0%	6	19.4%
	Mild improvement	0	0.0%	12	80.0%	12	38.7%
	No change	0	0.0%	2	13.3%	2	6.5%
Total		16	100.0%	15	100.0%	31	100.0%

Nasal itching

Nasal itching		Group				Total	
		Study		Control			
		N	%	N	%	N	%
15th day	Cured (100%)	3	18.8%	0	0.0%	3	9.7%
	Moderate improvement	2	12.5%	0	0.0%	2	6.5%
	Mild improvement	7	43.8%	6	40.0%	13	41.9%
	No change	4	25.0%	9	60.0%	13	41.9%
31st day	Cured (100%)	10	62.5%	2	13.3%	12	38.7%

	Moderate improvement	2	12.5%	0	0.0%	2	6.5%
	Mild improvement	2	12.5%	6	40.0%	8	25.8%
	No change	2	12.5%	7	46.7%	9	29.0%
45th day	Cured (100%)	12	75.0%	3	20.0%	15	48.4%
	Moderate improvement	2	12.5%	0	0.0%	2	6.5%
	Mild improvement	0	0.0%	9	60.0%	9	29.0%
	No change	2	12.5%	3	20.0%	5	16.1%
Total		16	100.0%	15	100.0%	31	100.0%

Nasal obstruction

Nasal obstruction		Group				Total	
		Study		Control			
		N	%	N	%	N	%
15th day	Cured (100%)	3	18.8%	0	0.0%	3	9.7%
	Mild improvement	10	62.5%	1	6.7%	11	35.5%
	No change	3	18.8%	14	93.3%	17	54.8%
31st day	Cured (100%)	9	56.3%	0	0.0%	9	29.0%
	Moderate improvement	3	18.8%	0	0.0%	3	9.7%
	Mild improvement	3	18.8%	3	20.0%	6	19.4%
	No change	1	6.3%	12	80.0%	13	41.9%
45th day	Cured (100%)	14	87.5%	0	0.0%	14	45.2%
	Moderate improvement	1	6.3%	0	0.0%	1	3.2%
	Mild improvement	0	0.0%	4	26.7%	4	12.9%
	No change	1	6.3%	11	73.3%	12	38.7%
Total		16	100.0%	15	100.0%	31	100.0%

Sneezing

Sneezing		Group				Total	
		Study		Control			
		N	%	N	%	N	%
15th day	Mild improvement	14	87.5%	2	13.3%	16	51.6%
	No change	2	12.5%	13	86.7%	15	48.4%
31st day	Cured (100%)	7	43.8%	0	0.0%	7	22.6%
	Moderate improvement	7	43.8%	0	0.0%	7	22.6%
	Mild improvement	2	12.5%	7	46.7%	9	29.0%
	No change	0	0.0%	8	53.3%	8	25.8%
45th day	Cured (100%)	14	87.5%	0	0.0%	14	45.2%
	Moderate improvement	2	12.5%	0	0.0%	2	6.5%
	Mild improvement	0	0.0%	13	86.7%	13	41.9%
	No change	0	0.0%	2	13.3%	2	6.5%
Total		16	100.0%	15	100.0%	31	100.0%

AEC

AEC	Group				Total	
	Study		Control			
	N	%	N	%	N	%
Moderate improvement	3	18.8%	3	20.0%	6	19.4%
Mild improvement	3	18.8%	3	20.0%	6	19.4%
No change	10	62.5%	6	40.0%	16	51.6%
Negative change	0	0.0%	3	20.0%	3	20.0%
Total	16	100.0%	15	100.0%	31	100.0%

IgE

IgE	Group				Total	
	Study		Control			
	N	%	N	%	N	%
Moderate improvement	0	0.0%	1	6.7%	1	3.2%
Mild improvement	4	25.0%	1	6.7%	5	16.1%
No change	11	68.8%	8	53.3%	19	61.3%
Negative change	1	6.3%	6	33.3%	7	39.6%
Total	16	100.0%	15	100.0%	31	100.0%

RESULTS AND DISCUSSION

Discussion related to subjective parameters

***Kshavathu* (Sneezing)**

Kshavathu	Group	Mean	Std. Deviation	Mean Rank	Mann-Whitney U	Z value	p value
BT	Study	2.938	0.250	16.531	111.500	-0.656	0.512
	Control	2.867	0.352	15.433			
AT1	Study	2.063	0.443	11.313	45.000	-3.396	0.001
	Control	2.733	0.458	21.000			
AT2	Study	0.688	0.704	9.344	13.500	-4.362	0.000
	Control	2.333	0.617	23.100			
AT3	Study	0.188	0.403	8.781	4.500	-4.850	0.000
	Control	1.933	0.594	23.700			

Mann-Whitney U Test, Significant at 0.05 level

The trial group showed remarkable improvement in *Kshavathu* with a 76.6% reduction, whereas the control group demonstrated a moderate decrease of 18.6%.

***Tanusrava* (Running nose)**

Tanusrava	Group	Mean	Std. Deviation	Mean Rank	Mann-Whitney U	Z value	p value
BT	Study	2.875	0.342	16.063	119.000	-0.068	0.946
	Control	2.867	0.352	15.933			
AT1	Study	1.750	0.856	12.063	57.000	-2.714	0.007
	Control	2.533	0.640	20.200			
AT2	Study	0.875	0.806	10.750	36.000	-	0.001

	Control	2.133	0.834	21.600		3.470	
AT3	Study	0.375	0.500	9.375	14.000	-4.450	0.000
	Control	1.867	0.640	23.067			

The is trial group exhibited a notable improvement in *Tanusrava*, with a reduction of 69.6%, while the control group showed a moderate decrease of 37.2%.

***Shhirashoola* (Headache)**

The group showed remarkable improvement in *Shhirashoola* with a reduction of 81.5%, whereas the control group demonstrated a moderate decrease of 35%.

Shhirashoola	**Group**	**Mean**	**Std. Deviation**	**Mean Rank**	**Mann-Whitney U**	**Z value**	**p value**
BT	Study	1.688	1.401	16.844	106.500	-0.585	0.559
	Control	1.333	1.496	15.100			
AT1	Study	1.063	1.063	16.063	119.000	-0.043	0.966
	Control	1.067	1.223	15.933			
AT2	Study	0.313	0.602	13.938	87.000	-1.533	0.125
	Control	0.867	1.060	18.200			
AT3	Study	0.000	0.000	13.000	72.000	-2.757	0.006
	Control	0.800	1.082	19.200			

Mann-Whitney U Test, Significant at 0.05 level

Here both groups were able to reduce *Shirashoola* but statistically significant difference was not seen in AT1 and AT2 but trial group was able to show a statistically significant change during follow up showing the persistent effect of treatment in trial group.

***Galashosha* (Dryness of throat)**

Galashosha	**Group**	**Mean**	**Std. Deviation**	**Mean Rank**	**Mann-Whitney U**	**Z value**	**p value**
BT	Study	0.750	1.342	15.125	106.000	-0.675	0.500
	Control	1.067	1.387	16.933			
AT1	Study	0.438	0.814	14.500	96.000	-1.152	0.249
	Control	0.933	1.223	17.600			
AT2	Study	0.000	0.000	13.000	72.000	-2.762	0.006
	Control	0.733	0.961	19.200			
AT3	Study	0.000	0.000	13.500	80.000	-2.475	0.013
	Control	0.600	0.910	18.667			

Mann-Whitney U Test, Significant at 0.05 level

The trial group exhibited a notable improvement in *Galashosha*, with a reduction of 100%, while the control group showed a moderate decrease of 31.3%. Both trial and control group reduced *Galashosha*, but trial group had more significant change in *Galashosha* after treatment and after follow up.

***Nistoda shanka* (Pricking pain in temporal region)**

Nistoda shanka	Group	Mean	Std. Deviation	Mean Rank	Mann-Whitney U	Z value	p value
BT	Study	1.750	1.438	17.625	94.000	-1.140	0.254
	Control	1.133	1.457	14.267			
AT1	Study	1.063	0.998	16.781	107.500	-0.556	0.578
	Control	0.867	1.125	15.167			
AT2	Study	0.438	0.629	15.250	108.000	-0.546	0.585
	Control	0.667	0.900	16.800			
AT3	Study	0.063	0.250	13.844	85.500	-1.982	0.048
	Control	0.600	0.910	18.300			

Mann-Whitney U Test, Significant at 0.05 level

So, there is a significant difference between trial and control group at AT3. The trial group demonstrated a significant improvement in *Nistoda shanka*, with a reduction of 75%, whereas the control group experienced a more modest decrease of 41.2%. Here both groups were able to reduce *Shanka nistoda* but a statistically significant change was noted for trial group during follow up showing the persistent effect of treatment in trial group.

***Swarabheda* (Hoarseness of voice)**

Swarabheda	Group	Mean	Std. Deviation	Mean Rank	Mann-Whitney U	Z value	p value
BT	Study	0.750	1.342	15.000	104.000	-0.744	0.457
	Control	1.000	1.195	17.067			
AT1	Study	0.438	0.814	14.094	89.500	-1.421	0.155
	Control	1.000	1.195	18.033			
AT2	Study	0.063	0.250	13.344	77.500	-2.297	0.022
	Control	0.733	1.033	18.833			
AT3	Study	0.000	0.000	13.500	80.000	-2.471	0.013
	Control	0.667	1.047	18.667			

Mann-Whitney U Test, Significant at 0.05 level

There is a significant difference between trial and control group at AT3. The trial group showed remarkable improvement in *Swarabheda* with a reduction of 91.7%, whereas the control group demonstrated a moderate decrease of 26.7%. Both trial and control group reduced *Swarabheda*, but trial group had more significant change in *Swarabheda* after treatment and after follow up.

Rhinorrhea

Rhinorrhoea	Group	Mean	Std. Deviation	Mean Rank	Mann-Whitney U	Z value	p value
BT	Study	2.875	0.342	16.063	119.000	-0.068	0.946
	Control	2.867	0.352	15.933			
AT1	Study	1.750	0.856	12.063	57.000	-2.714	0.007
	Control	2.533	0.640	20.200			
AT2	Study	0.875	0.806	10.750	36.000	-3.470	0.001
	Control	2.133	0.834	21.600			
AT3	Study	0.375	0.500	9.375	14.000	-4.450	0.000
	Control	1.867	0.640	23.067			

Mann-Whitney U Test, Significant at 0.05 level

There is a significant difference between trial and control group at AT3. The trial group exhibited a notable improvement in rhinorrhea, with a reduction of 69.6%, while the control group showed a moderate decrease of 37.2%.

Nasal itching

Nasal itching	Group	Mean	Std. Deviation	Mean Rank	Mann-Whitney U	Z value	p value
BT	Study	2.250	1.000	14.250	92.000	-1.282	0.200
	Control	2.600	0.828	17.867			
AT1	Study	1.125	0.957	11.469	47.500	-3.038	0.002
	Control	2.200	0.775	20.833			
AT2	Study	0.375	0.719	10.938	39.000	-3.442	0.001
	Control	1.867	1.125	21.400			
AT3	Study	0.125	0.342	10.750	36.000	-3.781	0.000
	Control	1.533	0.990	21.600			

Mann-Whitney U Test, Significant at 0.05 level

So, there is a significant difference between trial and control group at AT2. At AT3 (45th day), the calculated mean rank is 10.750 and 21.600 for trial and control group respectively with p value <0.05. So, there is a significant difference between trial and control group at AT3. The trial group showed remarkable improvement in nasal itching with a reduction of 83.3% whereas the control group demonstrated a moderate decrease of 28.2%.

Nasal obstruction

Nasal obstruction	Group	Mean	Std. Deviation	Mean Rank	Mann-Whitney U	Z value	p value
BT	Study	2.438	0.814	16.219	116.500	-0.157	0.875
	Control	2.400	0.828	15.767			
AT1	Study	1.375	0.957	11.781	52.500	-2.868	0.004
	Control	2.333	0.816	20.500			
AT2	Study	0.500	0.730	9.750	20.000	-4.155	0.000
	Control	2.200	0.775	22.667			
AT3	Study	0.063	0.250	9.031	8.500	-4.845	0.000
	Control	2.133	0.743	23.433			

Mann-Whitney U Test, Significant at 0.05 level

The trial group demonstrated a significant improvement in Nasal obstruction, with a reduction of 79.5%, whereas the control group experienced a more modest decrease of 11.11%.

Sneezing

Sneezing	Group	Mean	Std. Deviation	Mean Rank	Mann-Whitney U	Z value	p value
BT	Study	2.938	0.250	16.531	111.500	-0.656	0.512
	Control	2.867	0.352	15.433			
AT1	Study	2.063	0.443	11.313	45.000	-3.396	0.001
	Control	2.733	0.458	21.000			
AT2	Study	0.688	0.704	9.063	9.000	-4.560	0.000
	Control	2.400	0.507	23.400			
AT3	Study	0.125	0.342	8.625	2.000	-5.025	0.000
	Control	2.000	0.535	23.867			

Mann-Whitney U Test, Significant at 0.05 level

The trial group showed remarkable improvement in Sneezing with a 76.6% reduction, whereas the control group demonstrated a moderate decrease of 18.6%.

Discussion Related to Objective Parameters

AEC

Paired samples test is used to compare the AEC between 0th day and 31st day values within each group, there is a significant difference in AEC between 0th day and 31st day in the control group. Both trial and control group were able to show a reduction in AEC in within group analysis.

AEC	Group	Mean	Std. Deviation	Std. Error Mean	Mean Difference	t value	p value
Study	0th day	708.625	411.497	102.874	231.500	2.469	0.026
	31st day	477.125	160.982	40.245			
Control	0th day	671.000	204.341	52.761	176.475	3.352	0.005
	31st day	494.525	122.516	31.633			

Paired Samples Test, Significant at 0.05

IgE

IgE	Group	Mean	Std. Deviation	Std. Error Mean	Mean Difference	t value	p value
Study	0th day	1102.456	827.789	206.947	140.388	3.541	0.003
	31st day	962.069	797.462	199.366			
Control	0th day	1335.721	863.100	222.851	-53.213	-0.580	0.571
	31st day	1388.933	846.106	218.464			

Paired Samples Test, Significant at 0.05

Paired Samples Test is used to compare the IgE between 0th day and 31st day within each group, there is a significant difference in IgE between 0th day and 31st day in the trial group. In Control group, there is no significant difference in IgE between 0th day and 31st day. Here the trial group was able to show a reduced IgE count but not the control group showing that the trial group is more effective in reducing serum IgE than control group within a month.

Probable Mode of Action of *Kulatha*

Dietary changes contribute in treatment of Allergic rhinitis as nutrients with anti-allergic activities are present in food items. Nutrients showing anti-inflammatory and anti-allergic effects include Vitamins A, C, E, Selenium, Copper, anti-oxidants etc.[9] Flavonoids are major bioactive compound found in horse gram which has the potential to regulate or inhibit inflammation. It has anti-inflammatory, anti-oxidant and immune modulatory properties.[10] It inhibits inflammation by reducing cytokine level (IL-6, IL-1β, and TNF α) or by suppressing prostaglandins COX-2 and ROS which are the key mediators.[11]

Flavonoids as anti-allergic agent- The primary mechanism through which flavonoids inhibit allergic responses is by interfering with the activation of T helper cells.[12] Flavonoids are classified into 12 major groups among which 6 has dietary significance. Among which flavones has less hydroxyl group at C3 of pyran ring.[13] Flavones and their synthetic derivatives display a range of biological activities, including antioxidant, antitumor, antiallergic, anti-inflammatory, cardioprotective, and antimicrobial effects.[14]

Ayurvedic view

Vataja Pratishyaya is a *Nasagataroga*, characterized by an imbalance of *Vata* and *Kapha Doshas*.

Kulatha due to its *Guna* helps to alleviate both *Vata* and *Kapha doshas* involved in *Vataja Pratishyaya*.[15]

By its *Kashaya rasa* - is *Kapha shamaka*.[16] *Vatahara*[17,18]

Having anti-inflammatory, immunomodulatory, analgesic action, it does *Shothahara, Vedana sthapana* and reduces *Shhirashoola* in *Vataja Pratishyaya* (allergic rhinitis).[19]

Probable mode of action of clinical yoga protocol

Allergic rhinitis is an inflammation of the nasal membranes characterized by symptoms such as nasal congestion, runny nose, sneezing, itching, and post-nasal drip.[20] Techniques that involve controlled breathing in yoga improve oxygen consumption and metabolic rate, benefiting both immediately and over the long term.[21] Regular practice of pranayama enhances cardiovascular and respiratory functions, promotes a shift toward parasympathetic autonomic

tone, mitigates the impact of stress and strain, and boosts both physical and mental health.[22]

In this study the Clinical yoga protocol along with *Kulatha yusha* and *Haridrakhanda* had been given to the trial group for a period of one month. Given CYP includes breathing exercises, *Tadasana, Ardhakati-chakrasana, Gomukhasanana* etc done for 45 minutes in a day.

Asanas involving breathing and pranayama strengthens the respiratory muscles, enhances awareness of airway expansion and contraction, promotes uniform, continuous, and rhythmic breathing, oxygenates all lung regions, clears blocked air passages, stabilizes bronchial reactivity, and improves overall respiratory function.[23]

Psychological stress is a factor which aggravates inflammation which is shown by increased level of CRP and cortisol. Both stress and anxiety promote hyperresponsiveness to produce allergens in allergic rhinitis. Yoga has been proven to reduce psychological stress by increasing brain alpha waves activities and serum cortisol levels.[24]

Probable mode of action of *Haridra khanda*

Major ingredient of *Haridrakhanda* is *Haridra* is *Shothahara* hence helps in reducing inflammation in nasal turbinates hence reducing nasal congestion. *Haridra* is also having anti histaminic property which helps in reducing rhinitis symptoms. *Pratishyaya* is *Vata Kapha pradhana vyadhi, Haridra* is having *VataKapha hara* property due to its *Katu tikta rasa* and *Ushna guna*. Other ingredients of *Haridrakhanda* including *Twak, Ela* etc is *Teekshna* in property which exhibits *srotoshodhana* action.[25]

CONCLUSION

After a detailed conceptual study, critical review, clinical observations, analysis of data and discussions, the following conclusions were evolved

- *Kulatha yusha* and Clinical Yoga Protocol has a statistically significant add on effect in the subjective parameters of participants with *Vataja Pratishyaya* with special reference to Allergic Rhinitis receiving *Haridra khanda* when compared with the group receiving *Haridra khanda* alone.
- In the objective parameters, statistically significant difference was not observed between trial and control groups.
- *Kulatha yusha* and Clinical Yoga Protocol have add-on effect in the subjective parameters of participants having *Vataja Pratishyaya* with special reference to Allergic Rhinitis receiving *Haridra khanda* when compared with the group receiving *Haridra khanda* alone.
- *Kulatha yusha* and Clinical Yoga Protocol have no add on effect in the objective parameters of participants having *Vataja Pratishyaya* with special reference to Allergic Rhinitis receiving *Haridra khanda* when compared with the group receiving *Haridra khanda* alone.

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Cite this article as:
Arya Anil, Sowmya C Nair. Add on Effect of Kulatha Yusha and Clinical Yoga Protocol in Vataja Pratishyaya with special reference to Allergic Rhinitis - A Comparative Clinical Trial. AYUSHDHARA, 2025;12(5):37-49.
https://doi.org/10.47070/ayushdhara.v12i5.2322
Source of support: Nil, Conflict of interest: None Declared

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