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Effect of *Jaloukavcharan* in *Abhishyanda* W.S.R. allergic conjunctivitis

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Abhishyanda (allergic conjunctivitis) is a highly common eye condition that affects people of all ages and is often equated with allergic conjunctivitis. In Ayurveda, *Abhishyanda* is recognized as the underlying cause of numerous eye disorders. Early and effective treatment is crucial, as delayed intervention can lead to severe complications that may jeopardize eyesight. Ayurveda offers a detailed description of *Jaloukavcharan* (leech therapy), which is utilized for treating various diseases across different body systems, including the ears, nose, throat, eyes, and head. Nowadays, leeches are also employed by ophthalmologists to address inflammatory conditions, traumatic injuries, and various eye diseases. The saliva of leeches contains various bioactive substances that have therapeutic effects in several medical conditions. The present case series is a single armed clinical trial of 30 patients having symptoms of allergic conjunctivitis like *Raga* (Congestion), *Kandu* (itching), *Sravam* (lacrimation), *Daham* (burning sensation), *Shookapoornatha* (foreign body) and *Prakasha Ashishnutha* (photophobia) with a course of 1 month. The primary data was gathered through interview and laboratory method. This includes semi structured questionnaire and lab investigations of absolute eosinophile count, HbsAg and HIV. *Jaloukavacharan* has demonstrated statistically significant results in treating all the above-mentioned subjective symptoms of *Abhishyanda* (allergic conjunctivitis) and the objective symptoms of absolute eosinophile countin some patients (23.3%). The treatment included three sessions on alternate days, followed by a follow-up of every 15 days over the span of one month with noside effects and a non-recurrence. Hence it can be used for *Abhishyanda* as prime treatment.

Keywords: *Abhishyanda,* Allergic conjunctivitis, *Ayurved, Jaloukavcharan, Kriyakalpa,* Leech therapy, *Netraroga*

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Abhishyanda is a condition within the *Sarvagata Netraroga* (diseases of conjunctiva) category, posing a significant threat to vision, ranging from mild to severe visual impairment. *Acharya Sushruta* identifies *Pittakaphaja Abhishyanda* as the primary cause of all eye diseases, classifying it as a *Aupasargikaroga* (contagious ailment)[1]. It is characterized with symptoms ranging from congestion of the eye (*Raga*) to photophobia (*Prakasha Asahishnutha*). The *Pittaj Abhishyanda* has close resemblance to allergic conjunctivitis with similar signs and symptoms such as congestion (*Raga*), itching (*Kandu*), lacrimation (*Sravam*)[2], burning sensation (*Daham*), foreign body (*Shookapoornatha*)[3], photophobia (*Prakasha Asahishnutha*) sensation in eyes. If not treated properly, it may lead to further complications like *Adhimantha* (glaucoma), *Hatadimantha* (Pthesis bulbi and exophthalmos) and *Drustinasha* (blindness)[4]. According to modern science, allergic conjunctivitis is the inflammation of the conjunctiva caused by allergens, and its symptoms resemble those of *Abhishyanda* described in Ayurvedic texts. Therefore, *Abhishyanda* can be correlated with allergic conjunctivitis. Allergic conjunctivitis is a common atopic disorder seen in ocular clinical practice. It is estimated that about one-fifth of the global population experiences some form of allergy, with approximately 20% of these cases being attributed to allergic conjunctivitis. The prevalence of allergic conjunctivitis varies across regions, typically ranging from 15% to 40%, with these differences likely influenced by both genetic and environmental factors, such as climate and pollution levels[5]. This condition can affect individuals of all ages, though it is most common in those between 4 and 20 years old, particularly in boys. Allergic conjunctivitis causes mild inflammation of the palpebral and bulbar

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Abbreviations
AT: After treatment, BT: Before treatment, S1: Setting 1, S2: Setting 2, S3: Setting 3, FU1: Follow up 1, FU2: Follow up 2, HS: Highly significant, NS: Not significant.

conjunctiva, often accompanied by severe chemosis. The most frequent ocular complications in patients with allergic conjunctivitis include corneal abrasion and keratoconus[6]. Additionally, drugs commonly used to treat allergic conjunctivitis may pose a risk of drug-induced glaucoma. In Ayurveda, our Acharyas have recommended various treatments for this condition, one of which is Rakthamokshan (bloodletting therapy)[7]. *Jaloukavacharan*, a method involving leech therapy, is considered one of the safest and most effective techniques, particularly for delicate organs like the eyes. Moreover, it can be done even in intolerable patients irrespective of age, sex etc. Here *Jaloukavacharan* (leech therapy) is the best method as this is a *Pitta* and *Kapha* vitiated condition and as the doshas are deep seated[8]. Therefore, this study aims to scientifically investigate the effectiveness of *Jaloukavacharan* in managing the *Abhishyanda* (allergic conjunctivitis).

Patient information

No. of patients: 31 patients registered, 1 patient dropped out and 30 completed the study. As the study included both adults and children the ICMR guidelines were followed.

Patient information

No. of patients: 31 patients registered, 1 patient dropped out and 30 completed the study.

Age of patients: between 6 to 40 yrs.

Sex: Male – 24 patients; Female – 7 patients

Marital status: married – 9; Unmarried - 22

Occupation: students – 20, service – 1, Labour- 5, Farmer - 2, other - 3.

Socioeconomic status: all the patients were above poverty line.

Religion: Hindu - 27, Muslim – 4.

Symptoms of patients

Minimum four symptoms are required *i.e.*, congestion (*Raga*), itching (*Kandu*), excessive tearing (*Sravam*), burning sensation (*Daham*) for inclusion of patients while other symptoms like foreign body sensation (*Shookapoornatha*), and sensitivity to light (Photophobia) along with first four symptoms present in patients were selected for study.

Previous illness: None of the patients had a history of any prior illnesses.

Family history: 3 patients had positive family history of repeated conjunctivitis while 28 patients had no any family history.

Diet: 24 patients have vegetarian diet while 7 patients have non-vegetarian diet.

Addiction: smoking – 4 patients; No any – 27 patients

Allergy: 30 patients had allergy to some materials while 1 patient had no allergy to any material.

Aggravating factors: Dust – 25 patients, wind – 14 patients, Cold – 12 patients,

Sunlight – 5 patients, Reading – 3 patients.

Past interventions and outcomes: No any

Clinical findings

Symptoms: The majority of eyes, total 62, exhibited congestion, itching, lacrimation, and a foreign body sensation. Additionally, 54 eyes experienced a burning sensation, and 38 showed signs of photophobia.

Status of conjunctiva recorded in patients' eyes: all the 30 patients had congestion of conjunctiva, 24 and 16 patients had congestion of papillae and follicle, respectively.

Inclusion criteria: patients having above mentioned symptoms were included in the study.

Exclusion criteria: patients with infective conjunctivitis and other ocular infections, those with bleeding and clotting disorders, and patients who tested positive for HIV and HBsAg.

Diagnostic assessment

Data was gathered through interviews and laboratory investigations such as HIV, HBsAg and Absolute Eosinophil Count; utilizing a combination of a semi-structured questionnaire and laboratory findings was used as research instruments.

Absolute eosinophil count: Among 30 patients, 25 patients had abnormal AEC and 5 patients had normal AEC.

Assessment criteria

Assessment criteria for the symptoms

1. Congestion: 0 →no congestion
   1 →Not very severe - very slight congestion.
   2→Quite severe - slight congestion
   3→Severe- Moderate Congestion.
   4→Very Severe Congestion.
2. Itching: 0→no itching
   1→not very severe-Slight itching occasionally on exposure to dust and wind relieves after rest
   2→Quite severe- itching continuously on exposure to dust and wind relieves after rest.
   3→Severe - itching throughout the day on exposure to dust and wind.

4→Very severe- severe itching throughout the day even in absence of causes, affecting routine activities.

3. Lacrimation: 0→No lacrimation.
   1→Not very severe–Occasionally on exposure to triggering factors.
   2→Quite severe –Continuously on exposure to triggering factors.
   3→Severe - intermittent, even without triggering factors.
   4→Very Severe - constant, affecting routine activities.
4. Foreign body sensation: 0→absent
   1→Not very severe – Occasionally on exposure to triggering factors.
   2→Quite severe – Continuously on exposure to light, dust and wind, decrease with rest.
   3→Quite severe – Continuously on exposure to light, dust and wind, decrease with rest.
   4→Very Severe - present throughout the day even in absence of causes, intolerable.
5. Burning sensation: 0→absent
   1→Not very severe – Occasionally on exposure to triggering factors.
   2→Quite severe – Quite severe – Continuously on exposure to light, dust and wind, decrease with rest.
   3→Severe- Severe- throughout the day on exposure to light, dust and wind do not decrease with rest, tolerable.
   4→Very Severe - present throughout the day even in absence of causes, in tolerable.
6. Photophobia: 0→No Photophobia.
   1→Not very severe – Occasionally when exposed to bright light.
   2→Quite severe - Continuously when exposed to bright light.
   3→Severe- photophobia even in less intensity of light.
   4→Very Severe- Severe photophobia that interfere with day to day activities.

Therapeutic interventions

The therapy consisted of three sessions on alternate days and follow up at 15-day intervals over the course of one month.

The essential materials are comprised of i. *Nirvisha Jalouka* (non-poisonous leech), ii. treatment room with all the equipment's needed for *Jaloukavacharan*, iii. *Triphala Kashaya*, and iv. *Triphala Ghrith.*

Procedure

A comprehensive assessment was conducted for all patients, covering factors such as age, gender, socioeconomic status, occupation, addictions, and other relevant details.

The patient was educated about the procedure and informed consent was obtained. Before starting, the patient was asked to satisfy natural urges and their vitals were checked. Surgical gloves were worn, and the eye was cleaned with *Triphala Kashaya.* The *Jalouka* was kept in a kidney tray with water mixed with *Haridra Choorna* for 2-5 min, then washed in fresh water. The patient was asked to lie comfortably, and the *Jalouka* was placed on the palpebral conjunctiva using wet cotton. After ensuring the *Jalouka* bit, its body was covered with wet cotton as it sucked blood, and it was occasionally wetted with water. Once the *Jalouka* detached by itself, it was transferred to a kidney tray. The eye was cleaned with *Triphala Kashaya* and *Triphala Ghrita*[9] was applied on the site with the help of cotton (bandaged) for 2-3 h as per need upto complete stoppage of bleeding. To clean the *Jalouka*, turmeric powder was sprinkled on its mouth, and it was gently pressed from tail to head until it vomited the sucked blood. The *Jalouka* was then washed in fresh water and transferred to bottol containing fresh and clean water. The patient was advised to take bed rest and informed about dietary guidelines (*Pathya Apathya*). Patient advised to take *ahara* (*pathya*) like *Gehu* (wheat), *Shasti shalitandul* (rice), *Mudga* (green gram), *Ghrita* (ghee), *Madhu* (honey), *Manuka* (Black resin), *Dadim* (pomegranate), *khandsharkara* (granulated sugar), *padabhyangya* at night (applying oil to foot); and advised to avoid sprouts, fish, sour foods, *krodha* (anger), *shoka* (sadness), *ashru* (crying), *divawap* (sleeping at day time), and *ratrijagran* (aweking at night time).

Criteria for assessment of overall effects

1. Total reduction - 100% complete resolution; throughout the follow-up period, all major concerns were fully resolved and showed no signs of recurrence.
2. Considerable recovery - 76 – 99% reduction of main symptoms.
3. Average recovery - 51 - 75% reduction of main symptoms.
4. Modest recovery - 26 - 50% reduction of main symptoms.
5. Unchanged - Less than 25% reduction in main symptoms.

Statistical analysis

The statistical analysis was conducted using SPSS software, version 20. The Friedman test was employed to analyse the significance of changes in subjective parameters. For parameters showing significance in the Friedman test, the Wilcoxon signed-rank test with Bonferroni correction was used post hoc to determine the timing of significant changes. For objective parameters, the paired t-test was conducted to analyse the timing of significant changes.

Follow up and outcome

The relief in the symptoms of allergic conjunctivitis at different intervals were observed. In the patients' symptoms like itching, lacrimation, burning sensation and photophobia was relieved in first sitting, while the symptoms like congestion and foreign body sensation was relieved in second sitting. Complete remission observed in 63.3% eyes. Marked relief was observed in 26.7% patients, moderate relief was observed in 6.7% patients, and mild relief was observed 3.3% patients. Unchanged symptoms was not seen in any patient. After treatment the normality rate of absolute eosinophil count got increased to 23.3%. There were no adverse effects seen in any patient.

Observations and results

In the current study, 64 patients were initially screened, and 31 patients with allergic conjunctivitis were enrolled. Out of these, 30 patients completed the treatment, while one patient dropped out. Consequently, the observations are based on 31 patients, with the results reported for the 30 who completed the treatment.

Results with level of significance

All symptoms were evaluated using the Friedman test to assess statistical significance over time. The parameters assessed-including congestion (Table 1), itching (Table 2), lacrimation (Table 3), foreign body sensation (Table 4), burning sensation (Table 5), and photophobia (Table 6)-demonstrated statistically significant differences during the treatment period, with a p-value of 0.0001, indicating high significance. Also, the objective parameter absolute eosinophil count showed the

Table 1 — Displays the results of the Friedman and Wilcoxon tests, showing a reduction in eye congestion in 60 eyes following treatment and during the follow-up period.

Friedman test											
Parameter		X2		P-value		Remark		Significant change in			
Congestion		373.514		.0001		HS		During Treatment			
Wilcox on test		Bonferroni correction=0.0083									
Parameter		Negative ranks			Positive ranks		Ties	Total	Z value	P-value	Remark
Congestion BE	N	MR	SR	N	MR	SR					
AT–BT	58	29.50	177.11	0	.00	.00	2	60	-6.734	.0001	HS
S1-BT	10	5.50	55.00	0	.00	.00	50	60	-2.972	.0001	HS
S2-S1	48	24.50	1176.00	0	.00	.00	50	60	-6.378	.0001	HS
AT-S2	42	21.50	903.00	0	.00	.00	18	60	-6.132	.0001	HS
FU1-AT	40	20.50	820.00	0	.00	.00	20	60	-6.325	.0001	HS
FU2-AT	46	23.50	1081.00	0	.00	.00	14	60	-6.651	.001	S

(Where, HS: Highly significant results)

Table 2 — Outlines the Friedman and Wilcoxon test results, indicating a decrease in eye itching in 60 eyes after treatment and throughout the follow-up period.

Friedman test											
Parameter		X2		P-value		remark		Significant change in			
Itching		351.524		.0001		HS		During treatment			
Wilcox on test		Bonferroni correction=0.0083									
Parameter		Negative ranks			Positive ranks		Ties	Total	Z value	P value	Remark
Itching BE	N	MR	SR	N	MR	SR					
AT–BT	60	30.50	1830.00	0	.00	.00	0	60	-7.018	.0001	HS
S1-BT	60	30.50	1830.00	0	.00	.00	0	60	-6.954	.0001	HS
S2-S1	54	27.50	1485.00	0	.00	.00	6	60	-6.705	.0001	HS
AT-S2	40	20.50	820.00	0	.00	.00	20	60	-6.070	.0001	HS
FU1-AT	2	6.50	13.00	10	6.50	65.00	48	60	-2.309	.021	NS
FU2-AT	2	8.50	17.00	14	8.50	119.00	44	60	-3.000	.003	S

(Where, HS: Highly Significant results; NS: Not significant)

significant difference before and after the treatment (Table 7). For those parameters showing significance in the Friedman test, post hoc analysis was conducted using the Wilcoxon signed-rank test with Bonferroni correction to determine the specific time points of significant change. The post hoc results also revealed statistically significant differences, with p-values of 0.0001 (highly significant) and 0.001/0.002 (significant), as detailed in Table 1 through 6.

Results of severity of symptom

For nasal congestion, 49.1% of patients experienced severe levels, 32.3% had very severe congestion, 19.3% reported a moderate degree of severity, and only 6.5% experienced minimal congestion. In terms of itching, majority of patients (%)-suffered from very severe itching, while the remaining 29% experienced severe itching. Regarding lacrimation, 35.5% of the patients had very severe symptoms, 32.3% experienced severe lacrimation,

Table 3 — Presents the Friedman and Wilcoxon test results, demonstrating a reduction in congestion in 60 eyes following treatment and during the follow-up period.

Friedman test											
Parameter		X2		P-value		Remark		Significant change in			
Lacrimation		357.364		.0001		HS		During treatment			
Wilcox on test				Bonferroni correction=0.0083							
Parameter		Negative ranks			Positive ranks		Ties	Total	Z value	P Value	Remark
Lacrimation BE	N	MR	SR	N	MR	SR					
AT–BT	60	30.50	1830.00	0	.00	.00	0	60	-6.836	.0001	HS
S1-BT	52	26.50	1378.00	0	.00	.00	8	60	-6.489	.0001	HS
S2-S1	42	21.50	903.00	0	.00	.00	18	60	-5.984	.0001	HS
AT-S2	40	20.50	820.00	0	.00	.00	20	60	-6.186	.0001	HS
FU1-AT	4	2.50	10.00	0	.00	.00	56	60	-2.000	.046	NS
FU2-AT	6	3.50	21.00	0	.00	.00	54	60	-2.449	.014	NS

(Where, HS: Highly Significant results; NS: Not significant)

Table 4 — Displays the results of the Friedman and Wilcox on tests, highlighting a reduction in foreign body sensation in 60 eyes after treatment and during the follow-up phase.

Friedman test											
Parameter		X2		P-value		Remark		Significant change in			
Foreign body sensation		329.60		.0001		HS		During treatment			
Wilcox on test				Bonferroni correction=0.0083							
Parameter		Negative ranks			Positive ranks		Ties	Total	Z value	P value	Remark
FB Sensation	N	MR	SR	N	MR	SR					
AT–BT	60	30.50	1830.00	0	.00	.00	0	60	-6.860	.0001	HS
S1-BT	38	19.50	741.00	0	.00	.00	22	60	5.725	.0001	HS
S2-S1	44	22.50	990.00	0	.00	.00	16	60	-6.207	.0001	HS
AT-S2	22	11.50	253.00	0	.00	.00	38	60	-4.523	.0001	HS
FU1-AT	0	.00	.00	0	.00	.00	60	60	1.000	.046	NS
FU2-AT	2	2.50	5.00	2	2.50	5.00	56	60	1.000	.014	NS

(Where, HS: Highly significant results; NS: Not significant)

Table 5 — Presents the Friedman and Wilcox on test results indicating a decrease in burning sensation in 54 eyes following treatment and throughout the follow-up period.

Friedman test											
Parameter		X2		P-value		Remark		Significant change in			
Burning sensation		289.856		.0001		HS		During treatment			
Wilcox on test				Bonferroni correction=0.0083							
Parameter		Negative ranks			Positive ranks		Ties	Total	Z value	P value	Remark
Burning sensation	N	MR	SR	N	MR	SR					
AT–BT	54	27.50	1485.00	0	.00	.00	0	54	-6.503	.0001	HS
S1-BT	36	18.50	666.00	0	.00	.00	18	54	-5.638	.0001	HS
S2-S1	34	17.50	595.00	0	.00	.00	20	54	-5.565	.0001	HS
AT-S2	14	7.50	105.00	0	.00	.00	40	54	-3.557	.0001	HS
FU1-AT	0	.00	.00	0	.00	.00	60	54	.000	1.000	NS
FU2-AT	0	.00	.00	2	1.50	3.00	58	54	-1.414	.157	NS

(Where, HS: Highly significant results; NS: Not significant)

Table 6 — The results of the Friedman and Wilcoxon tests demonstrate a reduction in photophobia in 38 eyes following treatment and during the follow-up period.

Friedman test											
Parameter	X2		P-value		Remark		Significant change in				
Photophobia	194.580		.0001		HS		During treatment				
Wilcox on test	Bonferroni correction=0.0083										
Parameter	Negative ranks			Positive ranks			Ties	Total	Z value	P value	Remark
Photophobia	N	MR	SR	N	MR	SR					
AT–BT	38	19.50	741.00	0	.00	.00	00	38	-5.729	.0001	HS
S1-BT	8	4.50	36.00	0	.00	.00	30	38	-2.828	.0001	HS
S2-S1	24	12.50	300.00	0	.00	.00	14	38	-4.899	.0001	HS
AT-S2	14	7.50	105.00	0	.00	.00	24	38	-3.742	.0001	HS
FU1-AT	0	.00	.00	0	.00	.00	38	38	.000	1.000	NS
FU2-AT	2	1.50	3.00	0	.00	.00	36	38	-1.414	.157	NS

(Where, HS: Highly significant results; NS: Not significant)

Table 7 — Showing result of absolute eosinophil count by paired t test

AEC	N	Mean	Mean difference	T-value	P-value
BT	30	456.27	41.533	6.124	.0001
AT	30	414.73			

25.8% had moderately severe lacrimation, and 6.4% reported it as not very severe. Concerning the sensation of a foreign body in the eye, 48.4% of the patients reported moderately severe discomfort, 29% experienced only minimal discomfort, 12.9% had very severe symptoms, and 9.7% suffered from severe sensations. For burning sensation, the largest group (35.5% of patients) exhibited a combination of not very severe, severe, or moderately severe burning sensations; 12.9% of patients did not experience any burning, while 9.7% had severe burning and 3.2% experienced very severe burning. Finally, with photophobia, 45.2% of patients had only a mild degree of sensitivity (not very severe), 38.7% reported no sensitivity at all, 12.9% experienced moderately severe photophobia, and 3.2% had severe photophobia. (as shown in Fig. 1 & Fig. 2)

Effect of *Jaloukavcharan* in *abhishyanda*

All the symptoms diminished during the course of treatment and completely resolved after the second session of *Jaloukavacharana*. (Fig. 3)

Discussion

Abhishyanda is manifested with symptoms ranging from congestion (*Raga*), itching (*Kandu*), lacrimation (*Sravam*), burning sensation (*Daham*), foreign body (*Shookapoornatha*), and photophobia (*Prakasha Asahishnutha*) sensation in eyes. Eosinophils have long been linked to allergic conditions, and absolute eosinophil count (AEC) is commonly utilized as a supportive parameter in diagnosing allergic conjunctivitis. AEC is a standard component of the basic allergy investigation panel and is known to have a positive association with allergic reactions. Hence, this study was conducted to assess the diagnostic value of absolute eosinophil count in cases of allergic conjunctivitis[10]. The results demonstrated a significant improvement in both subjective parameters assessed with the help of Friedmanand Wilcoxon test and absolute eosinophil count as objective parameter following the *Jaloukavacharan* procedure.

This technique is effective even when doshas are deeply seated. It alleviates *Pitta* due to its *Sheetadhivasa* (cooling properties) and *madhura rasa* (sweet taste). And hence reduced burning sensation (*Daham*), and Photophobia (*Prakasha Asahishnutha*).

Breakdown of pathophysiology (*Samprapthi*)

Although *Tridoshas* (*Vata*, *Pitta and Kapha*) are involved in the *samprapthi* (pathophysiology), the vitiated *dosha* is mainly *pitta* as per symptoms. According to acharyas, *Jaloukavacharan* is indicated in *Pittopasrista Vyadhis*. Especially after *Raktamokshana* amount of *Dushita Rakta* will be reduced and in turn *Pitta* will decrease (*Asrayasrayi Bhava*) (interdependent on each other), thus *Raga* (congestion), *Daha* (Burning Sensation)[11] and photophobia (*prakashaasahishnutha*) will get reduced. By *Dushita Rakta kshaya*, *Visrata* (Raw meat smell of blood) and *Dravata* (watery consistency of blood) will get reduced. This *Visrata* is contributed by *Prithvi Mahabhuta* and *Dravata* by Jala *Mahabhuta*[12]. Since *Kapha dosha* is predominant with *Prithvi* and *Jala Mahabhuta*, *Kaphadusti* will get reduced. Thus *Kandu* (itching), *Srava* (lacrimation), and Foreign body sensation (*Shookapoornatha*) got reduced. As *Dushita*

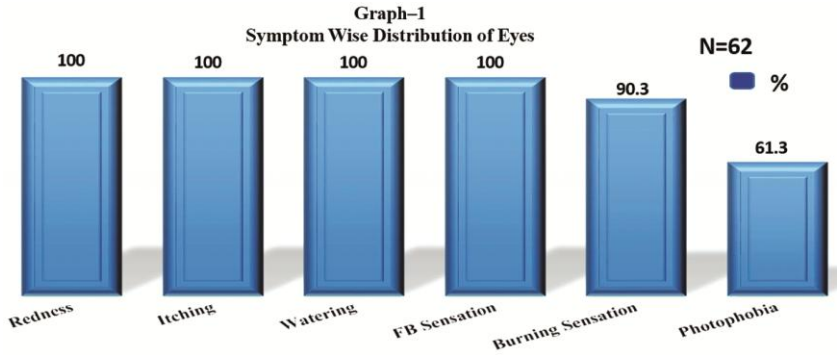

Fig. 1 — Observations of symptom wise distribution of eyes

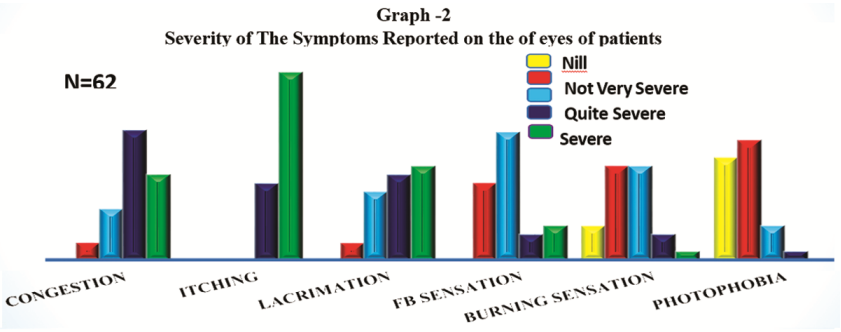

Fig. 2 — Observation of symptoms reported in the eyes of patients

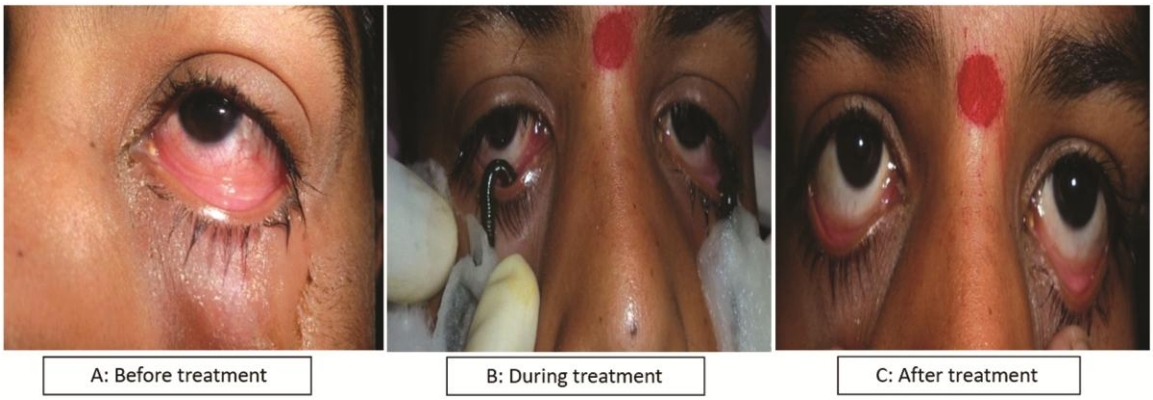

Fig. 3 — Image A, B, C showed the eye condition before treatment, during treatment and after the 3 rd setting of *Jaloukavcharan* treatment

rakta is being removed from the site these symptoms got reduced. The alleviation of allergic conjunctivitis symptoms was observed at various intervals. Most patients experienced relief from itching, tearing, burning sensation, and sensitivity to light after the first treatment session. Redness and the sensation of a foreign body in the eye were alleviated by the second session.

Mode of action of *Jalouka* (leech)

The several bioactive components present in the saliva of leech bring out the action. Hirudin inhibits blood coagulation and boosts the activity of white blood cells. It is crucial for keeping the wound open and preventing blood clotting[13]. Calin also inhibits blood coagulation and ensures slow wound cleansing by maintaining secondary bleeding for about 12 h, a process known as gentle blood letting[14]. Hyalurodinase is similar to histamine and dilates blood vessels, causing increased blood flow to the bite site[15]. Eglines have anti-inflammatory properties. Histamine-like substances and acetylcholine have vasodilation properties[16,17]. Leech therapy for *Abhishyanda* patients is performed on the palpebral part of the conjunctiva.

Since branches from the peripheral and marginal arterial arcades of the eyelid supply the palpebral conjunctiva, leeching in this area enhances blood flow throughout the conjunctiva. The conjunctival veins drain into the venous plexus of the eyelids, with some vessels near the cornea emptying into the anterior ciliary vein. The lymphatic system of the conjunctiva is divided into superficial and deep layers. Lymph from the lateral portion of the conjunctiva flows into the preauricular lymph nodes, whereas lymph from the medial portion drains into the submandibular lymph nodes. When the leeches attach and begin sucking blood, their saliva enters the puncture site, releasing enzymes that desensitize the area and introduce beneficial enzymes and components into the bloodstream, resulting in positive effects. The anticoagulant in the saliva thins the blood, promoting free flow through the vessels. These anti-clotting agents also dissolve existing clots, reducing the risk of blockages in arteries or veins[18]. Vasodilating agents, including histamine-like substances, acetylcholine, and carboxypeptidase inhibitors, help widen the vessel walls, ensuring unobstructed blood flow. Antibacterial enzymes are released to kill bacteria[19] causing eye problems as secondary infection, helping to boost the immune system and fight off further infections.

Conclusion

Jaloukavacharan is effective in alleviating symptoms of *abhishyanda* (allergic conjunctivitis) after three sittings, such as congestion, itching, tearing, burning sensation, foreign body sensation, and photophobia. It also demonstrated statistically significant results in reducing the absolute eosinophil count.

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Conflict of Interest

The authors declare that they have no conflict of interests.

Author Contributions

SC was involved in all aspects of the research, including conceptualization, design, definition of intellectual content, literature search, clinical studies, data acquisition and analysis, manuscript preparation and editing, and served as the guarantor (corresponding author). MK contributed to the design, definition of intellectual content, clinical studies, and analysis, editing, and manuscript review. AD and UK participated in the statistical analysis. All the 4 authors SC, MK, AD and UK are involved in literature review, data acquisition and manuscript preparation.

Ethics Approval

Ethical clearance was taken from the institutional ethics committee.

Informed Consent

Patients were thoroughly educated about disease management before the procedure commenced. Both the benefits and risks were clearly explained and documented in the consent form. Additionally, permission to publish the case series was obtained.

Data Availability

The data supporting the findings of this study are available within the manuscript and also can be obtained from the corresponding author upon reasonable request.

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