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Clinical Study on Haridradi Anjana in the Management of Sushkakshipaka (Dry Eye Syndrome)

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Abstract

Dry eye syndrome is a common yet frequently under-recognized clinical condition whose aetiology and management challenge clinicians and researchers alike. It is a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tears film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface. In *Ayurveda* this condition can be correlated to *Sushkakshipaka*. On the basis of etiopathogenesis, clinical features, complications and principles of treatment, *Sushkakshipaka* is much similar to Dry Eye Syndrome. Looking into the pathogenesis of the *Sushkakshipaka* it is a disease in which vitiated *doshas* are *vata* and *pitta* while affected *dhatu* are *Rasa*, *Rakta*, *Ashru* and *Akshi sneha*. Hence our treatment was aimed at *vata-pitta shamaka* and *ras rakta dhatu prasadana* and *snehana* and as per the treatment of Dry Eye Syndrome the treatment is designed to drug formulations increases the wet ability of corneal surface and stability of pre-corneal tear film prolonging tears ocular surface contact thus increasing the duration of action and penetration of the drug and interval of relief to patient. Keeping this concept in mind the present study was conducted, in which topical *Haridradi Anjana* was administered in 20 patients for 15 days.

Keywords

Dry Eye Syndrome, Sushkakshipaka, Haridradi Anjana

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INTRODUCTION

In *Ayurvedic* literature amongst the 76 eye diseases *Sushkakshipaka*[1] is a *sarvgata netra roga* and its description is very much similar to the disease Dry Eye Syndrome described in modern literature. Dry Eye Syndrome though a common condition causing considerable discomfort to patient, is often undiagnosed or misdiagnosed due to lack of a uniform set of criteria for the diagnosis, for which there has been no generally agreed gold standard. Dry eye [2] is a condition in which a person doesn't have enough quality tears to lubricate and nourish the eye. Tear production tends to diminish with age, with various medical conditions or as a side effect of certain medicines. Environmental conditions, such as wind and dry climates, can also decrease tear volume due to increased tear evaporation. The most common form of dry eyes occurs when the water layer of tears is inadequate. This condition called keratoconjunctivitis sicca (KCS) is also referred to as dry eye syndrome. People with dry eyes may experience irritated, gritty, scratchy or burning eyes, a feeling of something in their eyes; excess watering; and blurred vision .On management front, no curative treatment is available and palliative measures are inadequate too. The most commonly used modality; artificial tear drops require frequent instillation and sometime even worsen the condition due to preservative induced epithelio-toxicity while preservative free drops are too costly.

In view of magnitude of the problem, there is a need to develop a cheaper therapy which besides alleviating symptoms do have some curative properties and at the same time is free from side effects. This study is an attempt in this direction with following aims and objectives: While modern ophthalmology is struggling to find a definite cure for Dry Eye Syndrome. *Ayurvedic* texts have given an elaborate account of *Sushkakshipaka* management. In lieu of above facts an attempt has been made to evaluate the effectiveness of formulations mentioned in classical *Ayurvedic* texts for the treatment of *Sushkakshipaka*.

PATHOGENESIS

Samanya vata- pitta[3] *prakopaka nidana* cause *vata-pitta* predominant provocation and diffusion of *doshas* in whole body especially through *rasa-raktavahi siras* and their ascent to *shirasa* by driving forces of *vyana* and *udana vayu* . *Kha vaigunya* is achieved in *rasa rakta vahi srotas* of *netra* and after the *dosha dushaya sammurchana*

the *doshas* get localized in *sarva netra*. Consequently *rasa*, *rakta*, *meda* and *majja dushti* occurs.

Ruksha guna of *vata* cause depletion of *jaleeyansha* of *rasa* and *rakta dhatu* resulting in decreased *ashru*. *Ushna guna* of *pitta* result in *rakta vriddhi* and *paka* resulting in *akshipaka*. *Sushaka guna* of *vata* causes *sneha* depletion resulting in decresed *akshi sneha*. Moreover *majja dushti* causes *kshaya* of *akshi vita* which is *mala* of *majja dhatu* and *netra-abhishayand*[4] the *mool karana* of all *netra rogas*. *Meda dushti*[5] causes *netra glani* and dryness. All these pathophysiological changes lead to *Sushkakshipaka vayakta avastha*.

A similar pathology is given in Dry eye syndrome implicating tear hyperosmolarity, tear instability and ocular surface inflammatory damage as the culprit. Decreased *Jaleeyansha* can be correlated with tear hyperosmolarity and *akshipaka* by *pitta prakopa* and *netrabhishayanda* to ocular surface damage by inflammatory mediator's further decreased *snehana* of eye due to *meda* and *majja dushti* can be cause of tear flim instability.

MATERIAL AND METHODS

In the present study, 20 clinically diagnosed patients of *Sushkakshipaka* (Dry eye syndrome) were selected. Patients attending the O.P.D. and I.P.D. of N.I.A. were screened having the signs and symptoms of *Sushkakshipaka* and allotted to a single group. The results were assessed on the basis of gradation scoring with before and after treatment score.

AIMS AND OBJECTIVES

1. Conceptual and clinical study on *Sushkakshipaka* w.s.r. to Dry eye & its management with *Ayurvedic* principles.
2. To evaluate the therapeutic effect of *Haridradi Anjan* in the management of *Sushkakshipaka* (Dry Eye Syndrome).
3. Ethical committee Approval IEC/ACA/2013/89

Inclusion criteria

Age: 20 to 70 years

- Patient having specific symptoms of *Sushkakshipaka* (Dry eye syndrome).
- Patients of either sex were selected randomly.
- **Exclusion criteria**
- Individuals above 70 years and below 20 yrs of age of either sex.
- Patient with impaired eyelid function as in Bell's palsy etc.

- Patients with lid globe apposition.
- Patients with infective pathologies of eye.
- Patients with severe systemic illness.

Investigations: ESR and RA factor tests were carried out to rule out other systemic diseases associated with Dry Eye in the patients.

Design of the study: This study is designed with an open label pre and post study evaluation method.

Intervention methods: Topical administrations of *Haridradi Anjana* 1 *Vidangphal* (1 drop) once daily for 15 days.

Duration of Trial- 15 days

Follow up – Follow up was done once in 15 days for a period of one month

Method of preparation of the Drugs

In *Haridradi raskriya anjana*[6], *haridra* and *daruharidra* were taken in equal quantity in *churna* form and *kwath* was prepared by adding 16 times water to the total weight of drugs and then reduced it to one fourth by boiling over heat. Then the *kwath* was filtered and it mixed into *goghrita* and add little amount of *sandhav lavan* and *paka* was done in *mandagni* till it attained *raskriya* form .

ASSESSMENT CRITERIA

It was done on the basis of symptoms and signs of *Sushkakshipaka*. Both Subjective and Objective criteria were assessed before and after treatment. Ten subjective criteria with non parametric data, four objective criteria with non parametric data and two objective criteria having parametric data were analyzed in this study. The details regarding gradation and scoring is mentioned in Table-1, 2, and 3.

Table 1 Subjective Criteria/Non Parametric data

S No.	Symptoms	Score			
		0	**1**	**2**	**3**
1.	*Garsh* (Foreign body sensation) FBS	Absent	Occasnaly	Frequent	Continuous
2.	*Ushnadaha* (Burning sensation)	Absent	Mild	Moderate	Severe
3.	*Updeha* (Mucous discharge)	Abent	Mild	Moderate	Severe
4.	*Vishushkatva* (Dryness)	Absent	Occasnaly	Intermittent	Continuous
5.	*Toda* (Anesthopia)	Absent	Mild	Moderate	Severe
6.	*Kunita Vartma* (Photophobia)	Absent	Mild	Moderate	Severe

7.	*Kandu* (Itching)	Absent	Occasnaly	Intermittent	Continuous
8.	*Rag* (Redness)	Absent	Bul. Conj	Pal. Conj	Pal+ Bul
9.	*Darun Vartma* (Crusting of lid)	Absent	Occasnaly	Intermittent	Continuous
10.	*Krachonmeelnmilan* (Matting of lashes)	Absent	Stuck on waking	Frequent	Continuous

Table 2 Objective Criteria/ Non Parametric Data

SL No.	Symptoms	Score			
		0	**1**	**2**	**3**
1.	Mucin Strants	Absent	Spotting on S/L Examination	Spotting on diffuse illumination	
2.	Conjuctival Congestion	Absent	Mild	Moderate	Severe
3.	Tear Meniscus	Convex>1 mm	Convex < 0.5 mm	Absent	
4.	Rose Bengal Stain	Absent	Fine punctate in intrapalpebral area	Moderate entire exposed part	Moderate entire exposed part + Corneal

Table 3 Objective Criteria/Parametric Data

SL No.	Tests	Score			
		0	1	2	3
1.	Schirmer – 1 Test	>15-30 mm	11-15 mm	6-10 mm	<5 mm
2.	T – BUT	>15 sec	11-15 sec	6-10 sec	<5 sec

OBSERVATION AND RESULTS

Statistical analysis - The scoring criteria of assessment was analyzed statistically in terms of mean values of B.T. (Before Treatment), A.T (After treatment), S.D (Standard Deviation), and S.E (Standard Error). Various observations were made and results obtained were computed statistically using Student t- test and Wilcoxon matched pairs signed ranks test on Graph Pad Instat III software. Finally result were shown in terms of probability (p value) as p>0.05-Not Significant, p<0.01-Significant, p<0.001-Highly Significant P<0.0001- Extremely significant. Student paired t-test for parametric data and Wilcoxon matched pair signed ranks test for nonparametric data were used. The details regarding observation and result is mentioned in Table-4, 5, and 6.

RESULTS

The effect of treatment on different symptoms and investigations studied in this clinical study on dry eye were analyzed statistically. Effect of treatment on foreign body sensation (FBS) was observed

statistically extremely significant (ES) with p value <0.0001 with 70.37% relief. On all the subjective symptoms except asthenopia and Tear meniscus the effect of treatment shows statistically extremely significant results with significant relief on percentage basis which are shown in Table No. 4. Effect of treatment on reduction of mucin strands or debris on tear film was statistically extremely significant with 66.67% of relief.

Table 4 Effect of therapy on subjective criteria with Non Parametric data
(Wilcoxon matched pairs signed ranks test)

SL. No.	Parameters	Mean		D	%age Relief	SD ±	SE±	W	P	R
		BT	AT							
1.	FBS	1.35	0.40	0.95	70.37	0.749	0.12	465	<0.0001	ES
2.	Burning Sensation	1.10	0.50	0.60	54.57	0.590	0.0933	139	<0.0001	ES
3.	Mucous Discharge	0.82	0.37	0.45	54.54	0.597	0.094	136	<0.0001	ES
4.	Dryness	1.65	0.55	1.10	66.66	0.778	0.12	528	<0.0001	ES
5.	Asthenopia	0.55	0.35	0.20	36.36	0.405	0.064	36	<0.01	S
6.	Photophobia	0.85	0.30	0.55	64.70	0.504	0.080	253	<0.0001	ES
7.	Itching	1.02	0.35	0.675	65.85	0.797	0.126	190	<0.0001	ES
8.	Redness	1.37	0.45	0.925	67.27	0.526	0.083	595	<0.0001	ES
9.	Crusting	0.40	0.15	0.25	62.50	0.439	0.069	55	0.002	ES
10.	Matting of lashes	0.60	0.20	0.40	66.66	0.496	0.078	136	<0.0001	ES

Table 5 Effect of therapy on Objective criteria with Non Parametric data
(Wilcoxon matched pairs signed ranks test)

SL. No.	Parameters	Mean		D	%age Relief	SD ±	SE±	T	P	R
		BT	AT							
11.	Tear Meniscus	0.20	0.05	0.15	75.00	0.362	0.057	21	<0.01	S
12.	Mucin Debris	0.75	0.25	0.50	66.67	0.506	.080	210	<0.0001	ES
13.	Conjunctival Congestion	1.30	0.32	0.97	75	0.479	.075	630	<0.0001	ES
14.	Rose Bengal Stain	0.10	0.05	0.05	50	0.220	0.034	3.00	<0.500	NS

Table 6 Effect of therapy on Objective criteria with Parametric data
(Wilcoxon matched pairs signed ranks test)

SL. No.	Parameters	Mean		D	%age Relief	SD ±	SE±	T	P	R
		BT	AT							
15.	Schirmer- I	12.07	21.77	9.70	80.33	3.31	.524	18.51	<0.0001	ES
16.	T-BUT	11.5	12.97	1.42	12.33	0.957	.151	9.41	<0.0001	ES

On conjuctival congestion the treatment was observed extremely significant with 75% of relief. Not significant result was observed on Rose Bengal Staining with 50% of relief. Treatment was observed extremely significant on objective parameters like Schimer-I and Tear film break up time (T-BUT) with 80.33 % and 12.33% of relief respectively. These results are shown in Table No. 5 and 6.

DISCUSSION

Foreign body sensation, itching, asthenopia, photophobia due to irritation of cornea and conjunctiva and loss of moisture in ocular surface are symptoms found in Dry Eye Syndrome conditions. In this stage *Haridra*, *Daruharidra* in *Haridradi Anjana* were seen effective due to its *vednasthapana*[7], *vranaropana* and anti-inflammatory properties. Burning sensation is due to inflammation of cornea and conjunctiva. Thus in this stage, *Godugdh* and *Goghrita* were seen effective due to their *Dahashamaka*[8] and *Sheet virya* properties. The other symptoms like mucous discharge, redness and conjunctival congestion are due to ongoing inflammatory process. Hence in this stage *Haridra*, *Daruharidra* and *Sandhav* showed better results because of their anti-inflamatory[9, 10] properties. Symptoms like dryness, decreased tear meniscus height are due to inadequate aqueous tear secretion. Schirmer test showed improvements in tear secretion due to *Snehana* properties of *Goghrita* and *Godugdha*. Basal secretion and reflex secretion of tear are activated by hypothalamus and trigeminal nerve respectively. Better improvements were seen in tear secretion and tear film stabilization due to *Vatashamak* and *Snehana*[11] properties of *Godugdh* and *Goghrita* and thereby CNS stimulation. On Symptoms like crusting of lids and mucin debris the treatment was less effective due to *lekhneya*[12] properties of *Haridra*, *Daruharidra* and *Sandhav lavana*. On Tear flim breakup time the treatment was less effective as the treatment showed minimal effect on aqueous deficiency and lipid layer abnormality due to evaporation of tear.

MODE OF ACTION OF *ANJANA*

The selected drug '*Haridradi Anjana'* is a herbal formulation containing *Haridra*, *Daduharidra* , *Sandhav Goghrita* and *Godugdha*. It is a type of *prasadana rasakriya anjana* as it is prepared with *sneha dravyas* like *goghrita* which will be beneficial because of its *snigdha guna* and directly combats the dryness which is a predominant symptom in Dry eye. This formulation is having *madhura tikta rasa*, *ushna virya* and *madhura vipaka* and possesses *gunas* like *guru*, *snigdha*, *mridu*, *laghu*. It is predominantely *vata-pitta shamka*. This *rasakriyanjana* is having semisolid consistency which has enhanced bioavailability and there by better efficacy. It has high potency and penetration power

because it is a combination of herbal drugs mixed with *saindhava* which is *yogavahi* in nature and also acts as a preservative and makes the preparation isotonic.

Goghrita is also an active ingredient used in the formulation which helps in absorbtion. Lipophilic action of *ghrita* facilitates transportation of the drug to the target organ and final delivery inside the cell, because cell membrane is also formed of lipids. Hence the drug enters the eyeball by passing through conjunctiva which is a good absorbing surface. It then penetrates the cornea epithelium which is also permeable to lipid soluble substances which can cross corneal epithelium irrespective of their molecular size. Due to the instillation of this *anjana* which is rich in lipids material, it forms a uniform layer on ocular surface which reduces excessive evaporation of tears thereby preventing Evaporative Dry Eye.

CONCLUSION

1. Dry Eye Syndrome appears to be similar disease entity to the *Sushkakshipaka*. The etymology, aetiology. pathogenesis and clinical features of both correlate immensely.

2. *Anjana* in eye drop forms are easy to apply and have more bioavailability and enhanced shelf life without the untoward effects of preservatives. .

3. Mild transient irritation was noted on instillation of *Haridradi anjana*.

4. There was no specific effect seen on Itching.

5. The study shows that *Haridradi* Anjana alone were effective in alleviating symptoms of *Sushkakshipaka* (Dry Eye Syndrome).).

6. Research showed sustained relief as evident from 30 Days follow up study. Prolongation of therapy may provide better results.

7. Thus it can be concluded that this formulation is effective in management of *Sushkakshipaka* thus making it a point that cost effective and preservative free *Ayurvedic* formulation can be developed for this condition.

8. Systemic therapy, as described in A*yuvedic* text can be given to supplement topical drugs to enhance the action.

9. In chronic *Sushkakshipaka* the duration of therapy is prolonged than better response can be expected.

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