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Research Article

DRY EYE (*SHUSHKAKSHIPAKA*) AND MENOPAUSE – A SURVEY STUDY

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ABSTRACT

Dry eye occurs when there is inadequate tear volume or function resulting in an unstable tear film and ocular surface disease. It is extremely common condition, particularly in postmenopausal women and the elderly. Although epidemiological studies investigating the prevalence of dry eye disease are rare, published studies indicate that up to 20% of adults aged 45 years or more experience dry eye symptoms. Menopause is permanent cessation of menstruation at the end of reproductive life which is the natural biological process. During this period there is gradual progressive loss of ovarian follicular activity. The increase incidence of dry eye in males than in females shows a positive impact stating there is hormonal impact on the disease. Androgens are the prime hormones responsible for regulation of lipid production. Oestrogen and progesterone receptors in the conjunctiva and lacrimal glands are essential for the normal function of these tissues. In Ayurveda, the disease comes under *Sarvagata Roga* and is named as *Shushkakshipaka* where in there will be depletion of *Ashru* leading to *Shushka netra*, which afflicts whole eye in the later stages. In menopausal women there will be *Rasakshaya* leading to *Vata vriddhi*. This impairs the normal functioning of the *Netra* where in the *Shushkata* will increase leading to many other symptomatology. To elucidate the relationship between menopause and dry eye, a survey study has been conducted in OPD and IPD of Sri Kalabyraweshwaraswamy Ayurvedic medical college, hospital and research centre, Bangalore which is affirmed.

INTRODUCTION

Menopause means permanent cessation of menstruation at the end of reproductive life due to loss of ovarian follicular activity.[1] *Rajonivritti* is defined as the stage in women's life where there will be an end of *Artava Pravritti*. Acharya Dalhana quotes *Artava Kshaya* will leads to *Rasa Dhatu Kshaya* which inherently does the aggravation of *Vata Dosha*[2] which is considered as the main cause in the causation of the disease, *Shushkakshipaka*.

The tear film is mechanically distributed over the ocular surface through a neuronally controlled blinking mechanism. The tear film consists of three layers, lipid layer secreted by the meibomian glands, aqueous layer secreted by the lacrimal glands, mucous layer secreted principally by conjunctival goblet cells. Three factors are required for effective resurfacing of the tear film are normal blink reflex, contact between the external ocular surface and the eyelids, normal corneal epithelium. The four core inter-related mechanisms thought to be responsible for the manifestation of dry eye are tear instability; tear hyperosmolarity, inflammation and ocular surface damage. Dry eye occurs when the tear film is compromised as a result of reduced aqueous tear production and/ excessive tear evaporation.[3]

Sex hormones are related with pathology and pathophysiological changes in almost all organs

in the body, eye is not an exemption. Related sex hormones are androgens, estrogens and progesterones which are steroid hormones synthesised and secreted into the blood circulation primarily by the gonads and adrenal glands. Loss of androgen support to the meibomian and lacrimal glands reduces the volume and stability of preocular tears, decreasing the rate of tear turnover, increasing tear osmolarity and prolonging the exposure of the ocular surface to debris and microorganisms. Hyperosmolarity of the tear film stimulates synthesis and secretion of pro-inflammatory cytokines by the lacrimal gland and stressed ocular surface epithelia. The activation of inflammatory processes may subsequently impact neural function and disrupt the feedback mechanism to the lacrimal gland, further impending tear production and clearance. In contrast estrogen appear to promote such inflammatory processes in the meibomian gland, ocular surface epithelia and possibly the lacrimal gland, however, the role of estrogen in dry eye is complex and remains unclear.[4]

Clinical Presentation

Shushkakshipaka, a *Vataja sarvagata netra roga* where in the eyelids become *Daruna* (stiff), *Ruksha* (dry), *Avila Darshana* (blurriness of vision), *Krichronmilana Nimilana* (difficulty in opening and closing of eyelids), *Gharsha* (foreign body sensation), *Toda* (pricking sensation), *Bheda* (splitting type of pain), *Upadeha* (discharge) and there will be desire for cold comfort. There will be association of suppuration and ulceration.[5,6]

The most common ocular symptoms are feeling of dryness, grittiness and burning that characteristically worsen over the course of the day. Stringy discharge, crust formation, redness, transient blurring of vision are also common.

The signs include

Presence of Posterior Blepharitis

Conjunctival signs– Redness, staining with fluorescein and rose Bengal, keratinisation, conjunctivochalasis.

Tear film: Lipid contaminated mucin accumulates in the tear film as particles and debris that move with each blink and there will be absence or thinning of tear meniscus.

Cornea– Punctuate epithelial erosions stain well with fluorescein. Filaments consist of strands of mucus and debris such as shed epithelial cells and are typically attached at one end to the corneal surface. There will be the presence of mucous plaques.

Complications associated are vision threatening and include epithelial breakdown, melting, perforation and bacterial keratitis.[7]

Investigations

The aim of the investigation is to confirm and quantify a clinical diagnosis dry eye. The tests measure the following parameters:

Stability of the tear film as related to its breakup time – BUT.

Tear production– Schirmer, fluorescein clearance and tear osmolarity.

Ocular surface disease– corneal stains and impression cytology.[8]

In the present study Schirmer test was considered.

It is useful to assess the aqueous tear production. The test involves measuring the amount of wetting of a special filter paper, 5mm wide and 35mm long. The test can be performed with or without anaesthesia.

Details of the study undertaken

In three days, 50 menopausal women were randomly selected from the OPD and IPD of Sri Kalabyraweshwaraswamy Ayurvedic medical college, hospital and research centre, Bangalore. The details were noted in the questionnaire.

The test was conducted using Schirmer strips where in the amount of wetting of the filter paper was measured as follows:

Normal - >15mm

Grade 1 – 11-15mm

Grade 2 – 6-10mm

Grade 3 – 3-5 mm

Grade 4 – 0-2 mm

Age in Years	No. of patients	Symptoms						
		1	2	3	4	5	6	7
40-50	12	7	6	4	3	3	2	6
50-60	22	5	9	1	3	5	1	7
60-70	16	9	10	5	5	6	1	9
Total no of patients	50	21	25	10	11	14	4	22

1– Dry eyes, 2– Grittiness/foreign body sensation/Irritation, 3– Burning sensation, 4- Watering, 5– Eye strain, 6– Painful blinking, 7– Red eyes.

Schirmer Test Results

Grading/Age in Years	40-50	50-60	60-70	Total no of eyes affected
>15mm	16	18	8	49
11-15mm	6	6	3	15
6-10mm	4	6	5	15
3-5mm	1	3	5	9
0-2mm	2	2	8	12

Observations

Among the 50 participants, 12 (24%) participants belong to 40-50 years, 22 (44%) participants belong to 50-60 years and 16 (32%) participants belong to 60-70 years.

7 (14%) patients of age group 40-50 years, 9 (18%) patients of age group 50-60 and 12 (24%) patients of age group 60-70 were presented with the signs and symptoms of dry eye.

21 (42%) patients had the symptom of dryness, 25 (50%) patients had the symptom of foreign body sensation, 10 (20%) patients had the symptom of burning sensation, 11 (22%) of patients had the symptom of watering, 14 (28%) patients had the symptom of eye strain, 4 (8%) patients had the symptom of painful blinking, 22 (44%) patients had the symptom of redness.

Based on the Schirmer test value, 49 eyes were found to be normal. 15 eyes were having grade 1 severity, 15 eyes had grade 2 severity, 9 eyes had grade 3 severity.

Questionnaire for Survey

Primary Data

Name:	Date:
Age:	OPD No:
Religion:	Address:

Symptoms

Symptoms	Present or absent
Dry eyes	
Grittiness / FB sensation / Irritation	
Burning sensation of eyes	
Watering of eyes	
Eye strain	
Painful blinking of eyes	
Redness of eyes	
Others	

Schirmer Test Values

DISCUSSION

Aging has a broad impact on the function of human visual system. As the age advances, there will be an anatomical and physiological change which in turn causes decreased activity in its functional aspects. According to *Acharya Sharangadhara, Drushti* will diminishes at the age of 60-71 years.[9] The physiological changes taking place in the ocular tissue by aging is also impacted upon by *Vata Vruddhi* associated with hormonal changes in the menopausal women.

Jara and *Rajonivritti* are manifested due to progressive reduction in the functional ability of *agni*, which results in *Dhatukshaya* leading to *Vata Vriddhi*. The aggravated *Vata* enters the *Siras* through *Vatavaha Siras* and lodges on *Netra*. Here the *Laghu, Ruksha, Khara guna* of *Vata* is increased leading to *Daruna, Ruksha Vartma, Gharsha, Toda, Krichronmilana Nimilana, Avila Darshana*.

The presence of estrogen and progesterone receptors in the meibomian glands of human and various animal species suggests that this tissue is predisposed to the influence of sex hormones. The influence of estrogen on the meibomian glands appears to antagonise the actions of androgen, with resultant effects on suppression of lipid synthesis and promotion of meibomian gland dysfunction and thus evaporative dry eye occurs. The antagonistic effects of estrogen may help to explain the exacerbation of signs and symptoms of dry eye in post-menopausal women using estrogen replacement therapy. Increased production of proinflammatory cytokines, diffuse fibrosis and atrophy of the lacrimal gland driven by diminishing levels of circulating estrogen and progestreon.[10]

Because of the increased *Laghu, Ruksha Khara Guna* there manifests *Toda* which is a *Sharirasya Vikruta Vata laksnana* and also there will be a derangement caused to *Vata Vruddhi* in the form of *Shushkata* of *Netra*, by its reflex action there

will be watering of eyes. Nerves stimulated by the continuous exposure to environment due to inability in blinking the eyes send signals through the sensory nerves of the afferent trigeminal nerve which transmit the signals generating sensations like pricking pain. Further due to *Sharirasya Vikruta Vata Dosha, Toda* develops which is a type of *Vataja Shula*. Dryness is caused due to insufficient tear production or excessive tear evaporation resulting in tear hyperosmolarity causing ocular surface damage causing *Sangharsha*. *Raga* is considered as *Raktavruta Vata Lakshana*, which is associated with the inflammatory processes.

The treatment modalities explained in our science to counteract the disease are stated below:

Treatment	**Medicament**
Snehapana (Internal administration of ghee)	*Kulirarasa Siddha Ghrita*
Basti (Medicated enema)	*Ghruta Manda Siddha basti*
Nasya (Nasal administration of medicated drops)	*Jeevaniya gana siddha ghrita* *Anutaila* Medicated oil prepared with *Sariva, Vidari, Bala, Yashtimadhu, Kamala, Draksha, Atarushaka, Jeevaka, Raktachandana Kalka* or soup of *Jangala Mamsa* and *Go Ksheera*
Tarpana (Ocular nourishing therapy)	*Jeevaniya gana dravya*
Putapaka (Ocular nourishing therapy)	*Using Snigdha dravyas*
Seka (Pouring of medicated liquids)	Boiled and cooled *Ksheera* mixed with *Saindhava* Milk processed with *Haridra, Devadaru* and *Saindhava*
Aschyotana (Eye drops)	*Manjishta, Yashti, Kalanusari, Sariva, Lodhra, Laksha, Prapoundarika* *Draksha, Chandana* mixed with rice water and honey *Lodhra, Korandaka Pushpa*
Anjana (Collyrium)	*Shunti* triturated with *Stanya* and *Ghrita* *Snehanjana Shunti Saindhava* triturated with *Anupavasa*

CONCLUSION

Sex hormones have a direct impact on the tissues of the ocular surface including the cornea, conjunctiva and tear film. Alteration of the sex hormones has a positive impact in the pathophysiology of the disease, dry eye in menopausal women. In the present study 56% menopausal women showed signs and symptoms of dry eye which was confirmed by Schirmer's test, which is considered as the objective method of diagnosis. *Shushkakshipaka* is a *Vataja Sarvagata Netra Roga* where in aggravated *Vata* is mainly responsible for the causation of the disease. After *Rajonivritti*, there will be *Rasakshaya* leading *Vata Vruddhi* which is considered as a part of disease provocation factor. A further study has to be undertaken to screen the associated systemic disease or any other ocular disease which could be associated in the menopausal women causing dry eye to execute appropriate treatment protocol.

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