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Original Research Article

Effect of medical and surgical management and dry eyes in Eastern Odisha

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ABSTRACT

Background: Dry eye condition has multi-factorial origin and most of the times missed or left untreated leading to resistance in its treatment modalities. Various studies had been conducted with conflicting outcomes. Dry eyes condition being more prevalent in Odisha, there is very limited published data on its management. Hence this study was conducted to evaluate the efficacy and outcome of medical and surgical management of dry eye cases due to different aetiologies.
Methods: Patients were selected from those who attended ophthalmology, Skinand VD, O and G and Paediatrics OPD. Their tear film parameters like Tear film breakup time, tear meniscus height, Schirmer test, Rose Bengal stain were assessed at baseline level. Thereafter they were put on medical therapy for 6 weeks followed by appropriate surgical intervention like amniotic membrane graft, punctual occlusion, use of Symblepharon shell in resistant cases -which again was reviewed by analysis of tear film parameters.
Results: Majority of patients (75% approx.) responded well to medical therapy. non responders were due to Steven Johnson syndrome, Vitamin A deficiency, KCS and systemic association. These patients underwent surgical management with follow up after 6 weeks. After 6 weeks of surgical therapy 80% cases showed improvement, while few cases due to SJS showed poor response.
Conclusions: The medical modality of treatment was found to be the primary approach with better efficacy in majority of dry eye cases predominantly in mild to moderate severity. Surgical interventions proved more efficacious in severe degree of presentation.

Keywords: Dry eye, Medical, Surgical management

INTRODUCTION

Dry eye conditions are one among the most frequently encountered eye diseases.[1] Dry eye is a non infectious ocular surface disorder of tear film due to tear deficiency or excessive tear evaporation which causes damage to interpalpebral ocular surface and is associated with symptoms of ocular discomfort.[2] This condition is often equated with keratoconjunctivitis

Sicca, but the latter refers to quantitative and quantitative abnormality of lacrimal gland secretion.[3] Dry eye is characterised by ocular irritative symptoms tear film instability, tear hyperosmolarity and ocular surface disease. Tear film stability is maintained by compositional factors (lipid aqueous and mucin layers) hydro dynamic factors (corneal sensitivity) eye lid blinking and ocular surface epithelium homeostasis of tear film also involves delicate hormonal and neuronal regulatory mechanisms.[4] Dry eye patients can have wide range of symptoms such as heaviness, blurring, fluctuating vision, headache, corneal dessication, corneal ulcer and can even lead to blindness.[5] Most of the work on dry eye management had been reported from western countries but there are few studies done in this part of our country. The main stay of therapy for dry eyes is the replacement of deficient tear production with tear substitutes. Varied solutions can be normal

saline, ringer lactate solution, methylcellulose, hydroxypropyl methyl cellulose, hydroxy ethyl cellulose 1% polyvinyl alcohol 1.4% tear natural, paraffin oil etc.[6] The primary goal of artificial tears were corneal wetting, stabilization of tear film, provide moisture to corneal surface and prevent immediate breakup of tear film substances that rapidly wet such as detergents. Preservation of tears can be done by punctal occlusion or by plugs, goggles, moist chamber spectacles, contact lens etc. Acetylcysteine drops (10 or 20%) causes dispersal of mucin, thereby preventing corneal dryness.[7] Mucous membrane grafting from buccal mucosa is useful in patients with severely scarred conjunctive after chemical, burns, ocular pemphigoid and Steven johnson syndrome. Conjunctiva autografts are also tried for medical resistance cases. Tarsorrhapy can be helpful for dry eye patients with persistent epithelial defects and non infectious corneal ulcers for severe dry eye cases, amniotic membrane transplantation, mucus membrane grafts and keratoprosthesis can be tried for better outcome. Autoimmune aetiology can be taken care by topical immunomodulator (cyclosporine).[8] The study was therefore planned to evaluate the effect of medical and surgical management in tear film parameters of dry eye cases.

The present study aims to assess the outcome of tear film parameters by medical and surgical treatment in eastern Odisha, India.

METHODS

All the participants were selected from patients attending OPD of ophthalmology, O and G, Paediatrics and Dermatology department of SCBMCH Cuttack during November 2016 to March 2018, giving suggestive complaints. They were randomly chosen for study with fulfillment of diagnostic criteria. Those participants found associated with other irrelevant systemic disorders or were medicinal therapy were excluded from our study. The present study consists of 107 clinically diagnosed dry eye. Each case was carefully interrogated and after taking verbal concentration. Detailed history was taken under following headings with an interval of 10 to 15 minutes between each test to avoid biased results.

- Personal details of patient.
- Detail history of presentation and associated disorders.
- General and systemic examination.
- Local examination of eyes
- Slit Lamp examination for further evaluation of ocular structure.
- Blink rate.
- Tear meniscus height.
- Schirmer's test.
- Basal secretion test.
- PH of tear film
- Tear break up time invasive /Non invasive.
- 1% Rose Bengal staining.

Material required for the study

Corneal loupe, stop watch, slit Lamp, biomicroscope, sterile fluorescent strips, Whatman's filter paper no 41, pH Litmus indicated paper, 1% Rose Bengal stain, Topical anaesthesia (4% lidocaine), a measuring scale in mm, Bausch and Lomb keratometer, glass slide.

Personal history was given to emphasis to keep age factor in consideration and so as to also assess the purchasing power. Detailed drug history was taken to differentiate between unstable tear film and delayed tear clearance.[9] Systemic examination was done to assess any associated skin lesions or disorders. Slitlamp biomicroscopy was done to assess the lid, lacrimal puncta, eye lashes, lacrimal sacs for regurgitation conjunctiva for bitot spots in particular and cornea for any alterations in curvature and smoothness of surface anterior chamber for any reaction and sclera for any nodules.[10,11]

Tear meniscus height was measured as a parameter for tear deficiency.[12] Schrimer's test was done to measure basal and reflex secretion.[13] Basal secretion test was done by using topical anaesthesia.PH of tear film was known by Litmus paper. Tear break up time was recorded by Keratometer.[14] Rose Bengal 1% staining was done to examine debris and dead cells. Case card dry eyes (baseline proforma) was maintained as record for anticipation. All these data were registered as baseline.

Medical interventions like topical lubricating eye drops, gel, antibiotics and steroids were tried for all the participants and reviewed after 6 weeks. Non responders were selected for surgical interventions like soft BCL, daily dressing kit, plugs, symblepharon shell, amniotic membrane grafts and were again reviewed after a follow up period of 6 weeks. These data were registered as post intervention.

The baseline data is compared with the post intervention data to evaluate the effectiveness of the medical and surgical management in Dry eyes cases.

RESULTS

Table 1 shows that Blink rate was <15/min in majority of patients with KCS and vitamin A deficient aetiologies being the prominent ones. TBUT was less than 10 sec in maximum patient in this study. Tear meniscus height was less than 0.6mm in 91 patients compared to 16 patients with more than 0.6 mm. Schirmer test values showed less than15mm in majority of cases. Rose Bengal score was positive in patients, around three times to that of negative result. There was hardly any difference of visual acuity in categories of less than or more than 6/18.

Topical lubricating eye drops were preferred for majority of dry eye as a medical treatment modality (Table 2).

Systemic vitamin A supplementation was done for around 45 percent of patients followed by systemic antibiotics in 19 percent of cases. Lid hygiene and nutritional supplementation were done in maximum patients. There was hardly any difference in efficacy noted between these tear supplements keeping suppression of ocular manifestation into consideration. Topical vitamin A causes reversal of squamous metaplasia and improvement in symptoms.[15] Topical steroids decreases production and release of inflammatory cytokines responsible for dry eye state.[16]

Table 1: Patients status before medical management (Baseline).

Aetology	Blink Rate		TBUT		TMH		Schirmer Test		Rose Bengal Score		BCVA	
	<15/ min	>15/ min	<10 secs	>10 secs	<0.6 mm	>0.6 mm	<15 mm	>15 mm	Negative	Positive	<6/18	>6/18
KCS	21	4	19	6	21	4	19	6	6	19	17	8
V.A.D	12	19	27	4	27	4	25	6	6	25	14	17
SJS and Others	15	0	15	0	15	0	15	0	0	15	13	2
AC and B	6	7	7	6	9	4	13	0	7	6	2	11
Co and C	7	0	5	2	5	2	5	2	2	5	0	7
Lusers and R E, AHI	7	4	9	2	9	2	5	2	4	7	9	2
Systemic association	5	0	3	2	5	0	5	0	2	3	3	2
No of patients	73	34	85	22	91	16	91	16	27	80	58	49
Percentage	68.22	31.78	79.43	20.57	85.04	14.96	85.04	14.96	25.23	74.77	54.2	45.8

Table 2: Medical management (6 weeks).

Mode of admin	Therapy strategy	KCS	V.A.D	SJS and other	Allergicon junctivitis C and B	Computer and CL user	AHI	Systemic association	No of patients	Percentage (%)
Local	Methyl cellulose drops	6	7	4	4	2	4	1	26	24.3
	(OH) Methyl cellulose	6	8	4	3	2	3	2	26	24.3
	Polyvinyl alcohol	6	7	4	3	2	2	1	25	23.36
	Carboxy methyl alcohol	7	9	3	3	1	1	1	25	23.36
	Vit A	0	31	15	0	0	2	0	48	44.85
	Lubricating gel	0	0	15	0	0	0	0	15	14.01
	Antibiotics	8	12	15	13	0	0	0	48	44.85
	Steroids	0	0	15	13	0	0	0	28	26.16
	Soft BCL	0	0	15	0	0	0	0	4	3.73
	Daily dressing	0	0	15	0	0	0	1	15	14.95
Systemic	Vit A	0	31	15	0	0	0	2	48	44.85
	Antibiotics	0	0	15	6	0	0	0	21	19.62
	Steroids	0	0	0	0	0	0	0	15	14.01
	TRT of associated diseases	0	0	0	0	0	0	5	5	4.67
General	Interruption of premedications	0	0	15	0	0	0	0	15	14.07
	Avoid of predisposing factor	0	0	0	6	4	0	0	10	9.34
	Nutritional supplementation	20	31	15	0	0	11	2	79	73.83
	Maintain lid hygiene	25	31	15	13	2	11	5	102	95.32

Table 3: Patient status after 6 weeks of medical management.

Aetiology	Blink Rate		TBUT		TMH		Schirmer test		Rose Bengal Score		BCVA	
	<15/ min	>15/ min	<10 sec	>10 sec	<0.6 mm	>0.6 mm	<15 mm	>15 mm	Negative	Positive	<6/18	>6/18
KCS	6	19	4	21	6	19	6	19	21	4	4	21
Vitamin A deficiency	0	31	0	31	0	31	2	29	31	0	6	25
SJS and	12	3	12	3	12	3	10	5	5	10	10	5
Other allergic conjuncti-vitis and blepharitis	0	13	0	13	0	13	2	11	13	0	0	13
Computer and CL users, R. E	0	7	0	7	0	7	0	7	7	0	0	7
Ageing and Horm imbalance	2	9	2	9	2	9	2	9	11	0	2	9
Systemic association	2	3	0	5	2	3	2	3	5	0	2	3
Number of patients	22	85	18	89	20	87	24	83	93	14	24	83
Percentage	20.56	79.44	16.62	83.18	18.65	81.35	22.42	77.53	86.91	13.09	22.42	77.58

Table 4: Response to medical therapy after 6 weeks.

Aetiology	No of patients	Percentage	No of patients	Percentage
	Responded		Not responded	
KCS	19	76	6	24
Vit A def	25	80.64	6	19.36
SJS and Other	5	33.33	10	66.67
Alierg Conj and Blephantia	13	100	0	0
Comp and CL users and R.E	7	100	0	0
Ageing and Hormonal imb	9	81.81	2	18.19
Assoc disease	3	60	2	40
Total	81	75.7	26	24.3

The Table 3 shows that after 6 weeks of medical therapy tear film parameters especially blink rate, TBUT, TMH, Schirmer test values, RBS Score showed marked improvement.

Table 4 shows that and patients responded well to medical management except dry eyes due to Steven Johnson syndrome and associated diseases. Dry eye cases due to allergic conjunctivitis and computer users responded 100%. The responders were followed even after 6 weeks till end of 20wks. They were given instruction course on preventive measures.

The Table 5 shows that of 26 cases who did not respond to 6 weeks of medical therapy, 20 cases had various surgical procedures and rest 6 cases were associated with ratinal dystrophy, so advised only for regular follow-up. Amniotic membrane grafts and punctual occlusion therapy showed premising results in medical therapy resistant dry eyes. BCL tried for KCS patients gave immediate pain relief. Bandage contact lens tried in other 2 cases maintained the corneal surface moist and hastened the healing process.

Table 6 shows the response of patients who underwent surgical procedure and then followed every week for 6 weeks. All patients of KCS had normal blink rate, TBUT and TMH after 6 weeks of surgical management. SJS Patients were referred from skin and V.D dept and had sulphonamide as an aetiological history, already on antihistaminic, steroids. Patients referred from Obstetric and Gynaecology Dept were already on combined estrogen and progesterone therapy for menopausal symptoms. Patients referred from Paediatrics dept were on protein and vitamin A supplementation systemically.

Table 5: Surgical management.

Procedure	KCS	SJS	Ageing	Asso cause	No. of patients	Percentage (%)
Punctual occlusion	2	0	2	0	4	20
AMG	0	6	0	0	6	30
Release of symblepharon and placement of s shell	0	4	0	0	4	20
Tarsorrhaphy	0	0	0	2	2	10
BCL	4	0	0	0	4	20

Table 6: Patients status after 6 weeks of surgical management.

Aetiology	Blink Rate		TBUT		TMH		Schirmer test		Rose Bengal Score		BCVA	
	<15/ min	>15/ min	<10 sec	>10 sec	<0.6 mm	>0.6 mm	<15 mm	>15 mm	Negative	Positive	<6/18	>6/18
KCS	0	6	0	6	0	6	2	4	6	0	0	6
SJS and other	4	6	4	6	4	6	6	4	6	4	4	6
Ageing and Horm imbalance	0	2	0	2	0	2	2	0	0	2	0	2
Systemic association	2	0	0	2	0	2	0	2	0	0	2	0

DISCUSSION

Our baseline study showed decrease in values of tear film parameters, mainly due to keratoconjunctivitis sicca (KCS) and vitamin A deficiency, because of poverty and lack of awareness about this condition. Some myths and taboos are still prevailing to add as reason for late presentation. Dusty atmosphere and poor nutrition are major causes of these aetiologies. Various artificial tear substitutes were given to all different dry eye patients and there was marked improvement in tear film indices,which was coinciding quite well to studies done by Pflugfelder et al, Barabino S et al, Cohen S et al, Doughty et al, but there was no significant difference found in efficacy noted between them keeping suppression of ocular manifestation in consideration as also found in a study by Lee et al.[17-21] The slow delivery systems and low osmolarity tears were not tried in this study because of lack of availability in this part of country which is still embedded in poverty. Cases with corneal involvement were subjected to fluorescent stain routinely which confirmed keratitis, ulceration and impending perforations. They were found to be more marked in dry eyes syndrome from Steven Johnson's syndrome and systemic association disorders. Steroid administration was tapered, and those patients were assessed with strict vigilance unlike the study done by G.N. Foulks where corticosteroids were preferred mainly for elderly dry eye patients.[22] Non preserved topical methyl prednisolone produced rapid and dramatic improvement in KCS patients. Punctal occlusion was tried for KCS and elderly patients in this study with successful outcomes which was similar to study done by Cohen EJ et al.[23] Release of symblepharon and use of symblepharon shell were tried only for Steven Johnson syndrome patients in this study unlike to that by Dimit R et al, who tried scleral devices for elderly and associated causes aetiology of dry eye patients with limited success and recurrences.[24] Amniotic membrane grafts were tried only for Steven Johnson syndrome patients in this study for reconstruction of fornices and to suppress fibrosis with great success unlike studies done by Tseng et al and Solomon et al who included elderly and associated disorder with outcome of higher failure rate, may be due to decreased immunity in these aetiological categories.[25,26] Some Bandage contact lens patients had episodes of recurrence after removal but with proper maintenance, weekly OPD visits and adequate medical therapy, they proved beneficial in hastening the healing process. Conjunctival biopsy could have proved more effective in Sjogren syndrome and cicatrical cases but due to unavailability of resources for immunological studies, poor socioeconomical status, these are not included in this study.

CONCLUSION

Majority of cases responded well to 6 weeks of medical therapy with significant improvement of symptoms and signs. And non responders were due to Steven Johnson syndrome, Vitamin A deficiency, KCS and systemic association. After 6 weeks of surgical therapy 80% cases showed improvement, while few cases due to SJS showed poor response. In moderate to severe cases, punctual occasion and release of symblepharon with placement of shell helps in recovering useful vision. Amniotic membrane grafting promotes epithelial healing and reduces inflammation and scarring. Professionals

particularly computer users and daily preventive measures by voluntary blinking every hour or using lubricants at early stage. This condition, hence requires patience and dedicated management by ophthalmologist with quick referrals in severe presentation.

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