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Original Research Paper

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STUDY OF DRY EYE SYNDROME IN DIABETES MELLITUS PATIENTS

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ABSTRACT

Aim:- To study clinical features & management of dry eye syndrome in diabetes mellitus patients attending out patients department (OPD) of a tertiary eye care centre in state of Odisha.

Materials and methods: - This was a prospective study done for a period of 2 years from October 2014 to September 2016. Study involved 480 patients with diabetes mellitus. They were subjected to Schirmer test, tear film breakup time (TBUT) calculation, fluorescein staining. Those diagnosed with dry eye were divided in mild, moderate and severe category according to Schirmer scores. They were given treatment according to their severity.

Results: - 38.3% of patients had dry eye, out of which 23.3% have mild dry eye. In 61-80 years age group 96 cases (52.3%) presented with dry eye features. Male : female ratio was 1:1.49. Most common symptom was gritty feeling (59.8%). 78 cases (42.4%) had TBUT <10 sec. 60.8% patient showed improvement in symptoms at 1st month treated with lubricating drop and those cases responded well even after 6months.

Conclusion:- Dry eye syndromes should be diagnosed early and managed with lot of care and skill. Tear substitutes are the mainstay of treatment in case of dry eyes associated with diabetes.

KEYWORDS : Diabetes Mellitus, Dry Eye, Schimer Test.

INTRODUCTION:-

Dry eye is defined as "A multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface.[1] Diabetes Mellitus is often associated with several significant ocular conditions, such as diabetic retinopathy, refractive changes, dry eye syndrome, cataract, nerve palsies, glaucoma and macular oedema. However, one of the most common ocular complications associated with diabetes is dry eye.[2] More than half of patients with diabetes mellitus likely have dry eye disease.[3] This study was done to find the correlation between dry eye and diabetes mellitus in the patients attending a tertiary care hospital of state of Odisha.

MATERIAL AND METHODS:-

This study included 480 patients with diabetes mellitus. It was a prospective study of 2 years duration done from October 2014 to September 2016.

INCLUSION CRITERIA:

All Patients diagnosed as Diabetes mellitus are considered for this study.

EXCLUSION CRITERIA:

1. Patient with pre-existing systemic disease like Sjogren's syndrome, connective tissue diseases (Rheumatoid arthritis, Wegener's granulomatosis, Polyarteritis nodosa, etc.).
2. Patient on medications with Anti-histaminics, Anti-cholinergic group of drugs, Tricyclic Antidepressants, topical or systemic beta blockers, oral contraceptive pills, systemic or topical NSAIDS, long term Anti-glaucoma medications, post ocular surgery, ocular trauma which causes dry eye are specifically proven.

All the patients taken for study were subjected to routine investigations like blood & urine sugar analysis, HbA1C, ANA, RA factor were done where patients diagnosed as diabetes mellitus were subjected to Schirmer test, TBUT, Fluorescein staining. Those diagnosed with dry eye were divided in mild, moderate and severe category according to Schirmer scores. Patients who have a schirmer test of 10 to less than 15mm in 5 minutes was classified under mild dry eye, Schirmer test value of 5 to 10 mm in 5 minutes as moderate and Schirmer values less than 5 mm in 5 minutes as severe dry eye. In these patients detailed Ophthalmological investigations carried out - Visual acuity using Snellen's Chart, Slit-lamp bio microscopy, direct and indirect ophthalmoscopy, refraction and correction, IOP measurement.

Those diagnosed with dry eye syndrome were given treatment according to their severity.

Level 1- Mild to moderate dry eye- patient counseling, lubricating eye drops, environmental management.

Level 2-Moderate to severe dry eye- Along with level 1 treatment lubricating gels, Cyclosporine A group of drugs, topical anti-inflammatory drops, nutritional support (omega-3-fatty acid) are added.

Level 3-Severe dry eye- Along with level 1 and 2 following are added contact lens, punctal plugs.

Level 4-Severe symptoms with corneal erosions- Along with level 1, 2 and 3 following are added-Systematic anti-inflammatory therapy, oral cyclosporine, moisture chamber goggles, punctal cautery, and surgical therapy.

RESULTS:-

480 patients with diabetes mellitus were studied for evaluation of dry eye diseases.

TABLE – 1: PREVALENCE OF DRY EYE

TYPE OF DRY EYE	NO OF CASES	PERCENTAGE (%)
SEVERE DRY EYE	20	4.2
MODERATE DRY EYE	52	10.8
MILD DRY EYE	112	23.3
TOTAL DRY EYE	184	38.3
NO DRY EYE	296	61.7

38.3% of patients had dry eye, out of which 23.3% have mild dry eye.

TABLE – 2: AGE GROUP – DRY EYE ASSOCIATION

AGE GROUP	DRY EYE	Percentage (N=184)
≤20years	0	0%
21-40years	6	3.2%
41-60years	76	41.3%
61-80years	96	52.3%
>80years	6	3.2%

In 61-80 years age group 96 cases (52.3%) presented with dry eye features.

Almost 93.6% of dry eye cases belong to 41-80 years age group, as diabetes mellitus is a disease common in elderly people and menopausal women.

Prevalence of dry eye was more in female 110 cases (59.7%) as compared to male 74 cases (40.3%) out of total 184 cases. Male: female ratio was 1:1.49.

TABLE– 3: SYMPTOMS OF DRY EYE

SYMPTOMS OF DRY EYE	NUMBER OF CASES(TOTAL-184)	PERCENTAGE (%)
DRYNESS	88	47.8
REDNESS	65	35.3
BURNING SENSATION	79	42.9
FB SENSATION	90	48.9
GRITTY FEEL	110	59.8
BLURRED VISION	42	22.8
PAINFUL EYE	19	10.3

Most common symptom was gritty feeling (59.8%) followed by foreign body sensation (48.9%) and dryness (47.8%).

TABLE- 4: DURATION OF DM ASSCOCIATION WITH DRY EYE

DURATION OF DM	DRY EYE (%)	Percentage
<5years	26	14.1
5 to <10years	78	42.4
10 to <15years	44	23.9
15to <20years	28	15.2
>or =20years	8	4.3

Those with duration <5 years had lesser dry eye prevalence i.e. 26 cases (14.1%) and as the duration increased prevalence of dry eye increased.

TABLE –5: DIABETIC RETINOPATHY GRADE ASSOCIATION WITH DRY EYE

GRADE	DRY EYE (n=184)	Percentage
NO DR	48	26.1
MILD NPDR	54	29.3
MODERATE NPDR	48	26.1
SEVERE NPDR	24	13.1
PDR	10	5.4

54 cases (29.3%) had mild NPDR. With increasing severity of diabetic retinopathy, incidence of dry eye decreases. It may be due to increased impaired activity of sensory nerves.

Diabetic patients with dry eye had mean FBS of 148±21, mean PPBS of 218±45 and mean HbA1C of 8.5±0.9.

78 cases (42.4%) had TBUT <10 sec and rest 106 cases (57.6%) had TBUT of >=10-20secs.

TABLE- 6: MANAGEMENT OF DRY EYE CASES ACCORDING TO SEVERITY

MANAGEMENT	NO OF DRY EYE CASES	PERCENTAGE (%)
LUBRICATING DROPS	184	100%
ANTI-INFLAMMATORY AGENTS (TOPICAL)	72	39.1%
PUNCTAL PLUGS AND OR CONTACT LENS	20	10.9%
TARSORRHAPHY	4	2%
SYSTEMIC ANTI-INFLAMMATORY AGENTS	2	1%

Lubricating agents were given to all 184 diagnosed dry eye cases. Around 60.8% patient showed improvement in symptoms at 1st month and those cases responded well even after 6months. Those who did not respond after 1 month were given topical anti-inflammatory drops along with lubricating drops out of which 72.2% of patients responded well.

DISCUSSION:-

184 cases (38.3%) out of 480 diabetes patients were found to have dry eye diseases. The prevalence varies from 18.1% to 55% in various studies probably due to non-standardisation of types of patients selected for study, dry eye questionnaires, objective tests and dry eye diagnostic criteria. In our study 93.6% of dry eye cases belong to 41-80 years age group, as diabetes mellitus is a disease common in elderly people and menopausal women. This study shows association of dry eye with increasing age as also found by McCarty et al, Moss et al, Yazdani et al, and Nien CJ et al. Schein et al found no age co- relation.[4,5,6,7,8]

Prevalence of dry eye was more in female 110 cases (59.7%) in our study. McCarty et al, Moss et al, Yazdani et al showed female gender have been identified as risk factors for dry eye.[4,5,6] Deficient tear production from oestrogen deficiency in menopausal women has been hypothesised to explain the difference according to Schaumberg DA et al.[9] Most common symptom was gritty feeling (59.8%) followed by foreign body sensation (48.9%) and dryness (47.8%) in our study. These symptoms are reported frequently as dry eye symptoms in many studies such as Manaviat et al which showed gritty sensation as most common symptom in dry eye (36.2%).[3] Schein OD found various discrepancy between subjective complain of dry eye and the clinical tests available due to patient variances with reliability of many dry eye tests.[8]

In a hospital-based study Manaviat et al found 54% of those with diabetes had DES and there was a significant correlation between DES and the duration of diabetes. This suggests that examination for dry eye should be an integral part of the ocular examination in patients with diabetes.[3] Significant associations have been identified between diabetic retinopathy (DR) and DES. In a hospital-based study, J. Nepp et al found 17.1% of DES in patients with DM had mild non-proliferative diabetic retinopathy (NPDR), 17.1% had moderate NPDR, 11.1% had severe non-proliferative diabetic retinopathy (NPDR), and 25.1% had proliferative diabetic retinopathy (PDR).[10] Another hospital-based study by Manaviat et al showed that DES was more prevalent in individuals with DR and/or clinically significant macular oedema compared to the non-DR group.[3]

The current treatment regimens for diabetic and non-diabetic dry eye patients are essentially the same. To date, there is no unified treatment option for DES. Treatment recommendations by severity

level according to DEWS-2007 were followed in our study.

CONCLUSION:-

Dry eye 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. One of the most common ocular complications associated with diabetes is dry eye. Dry eye syndromes should be diagnosed early and managed with lot of care and skill. Tear substitutes are the mainstay of treatment in case of dry eyes associated with diabetes.

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