A CLINICAL STUDY OF OCULAR COMPLICATIONS OF DIABETES

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FINANCIAL DISCLOSURE
NO CONFLICT OF INTEREST

INTRODUCTION:

- There is an increasing prevalence and incidence of diabetes mellitus with advancing age .
- It is estimated that the number of diabetics in India will increase from 19 million to 57 million between 1995 and 2025 (1). There is recent recognition of the potential for diabetes to reach epidemic proportions in India, especially as rural areas in India rapidly “urbanise” .
- Ocular complications of diabetes manifests in myriad ways, but manifestations of diabetes other than diabetic retinopathy are easily overlooked.

Complications of diabetes mellitus are known to occur in almost every part of the visual organ. Some of these are not characteristic while others are pathognomic for diabetes. The most important complications are briefly listed as follows (2)

- Eyelids : Xanthelasmata, Blepharitis, Recurrent hordeolum, eczema.
- Conjunctiva : Microaneurysms, Venous dilatation.
- Cornea : Folds of Descement's membrane, neurotrophic keratitis.
- Iris : Iritis, Iris pigments on lens,Rubeosis Iridis.
- Pupil : Rigid pupil, light near dissociation.
- Lens : Cataract, refractive errors.
- Vitreous : Vitreous haemorrhage, asteroid hyalosis.
- Retina : Diabetic retinopathy; retinal vein occlusion, Lipaemia retinalis.
- Optic nerve : Ischemic papillitis; Optic atrophy.
- Extra-ocular Muscles : Palsy caused by 3rd, 4th, 6th cranial nerve involvement.
- Orbit : Mucormycosis.
- Intra-ocular pressure : Primary Open angle glaucoma, Neovascular glaucoma.

Diabetic retinopathy is the most common and serious complication of diabetes mellitus and is one of the major group of posterior segment diseases causing blindness.

AIMS AND OBJECTIVES:

- To determine the common ocular complications in diabetes.
- To determine ocular complications relating to duration of diabetes.

MATERIALS AND METHODS:

This is a hospital based cross sectional study conducted on 100 patients of diabetes mellitus attending Government Regional Eye Hospital , Visakhapatnam.

INCLUSION CRITERIA:

Known cases of type 1 and type 2 diabetes mellitus.

EXCLUSION CRITERIA:

- Gestational diabetes mellitus
- Known case of hypertension

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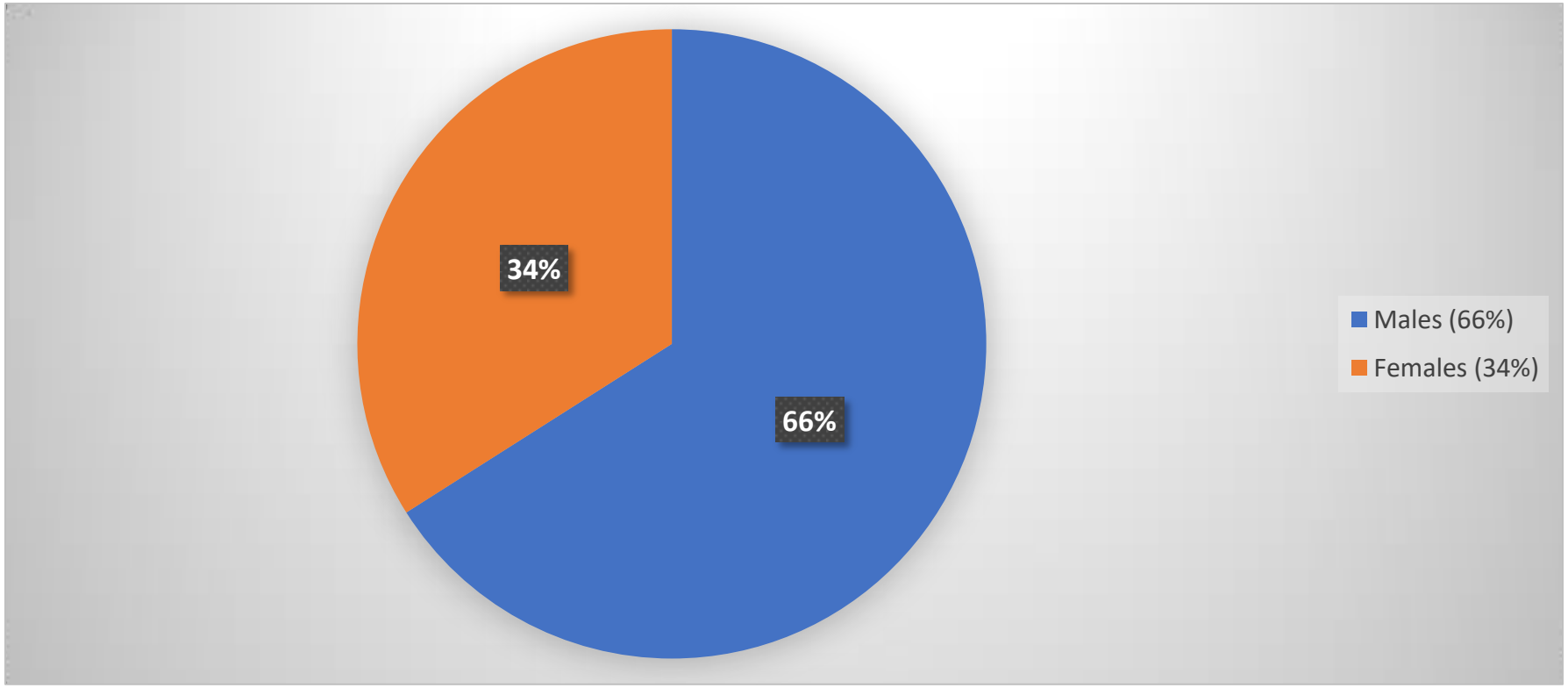
METHODOLOGY:

- Study included hundred patients attending ophthalmology out patient department , GREH with ocular complications of diabetes in one or both eyes .
- Detailed history of the patient was taken,which included presenting complaints history of presenting complaints, type of diabetes , duration of diabetes ,family history of diabetes was noted. A thorough general examination was done .
- Ocular examination included recording best corrected visual acuity , detailed anterior segment evaluation under slit lamp , tear film function tests , intraocular pressure recording ,retinal status evaluation done by Slit lamp biomicroscopy using 90D lens after pupillary dilation .
- Laboratory investigations: 1) fasting blood sugar 2) urine sugar

RESULTS:

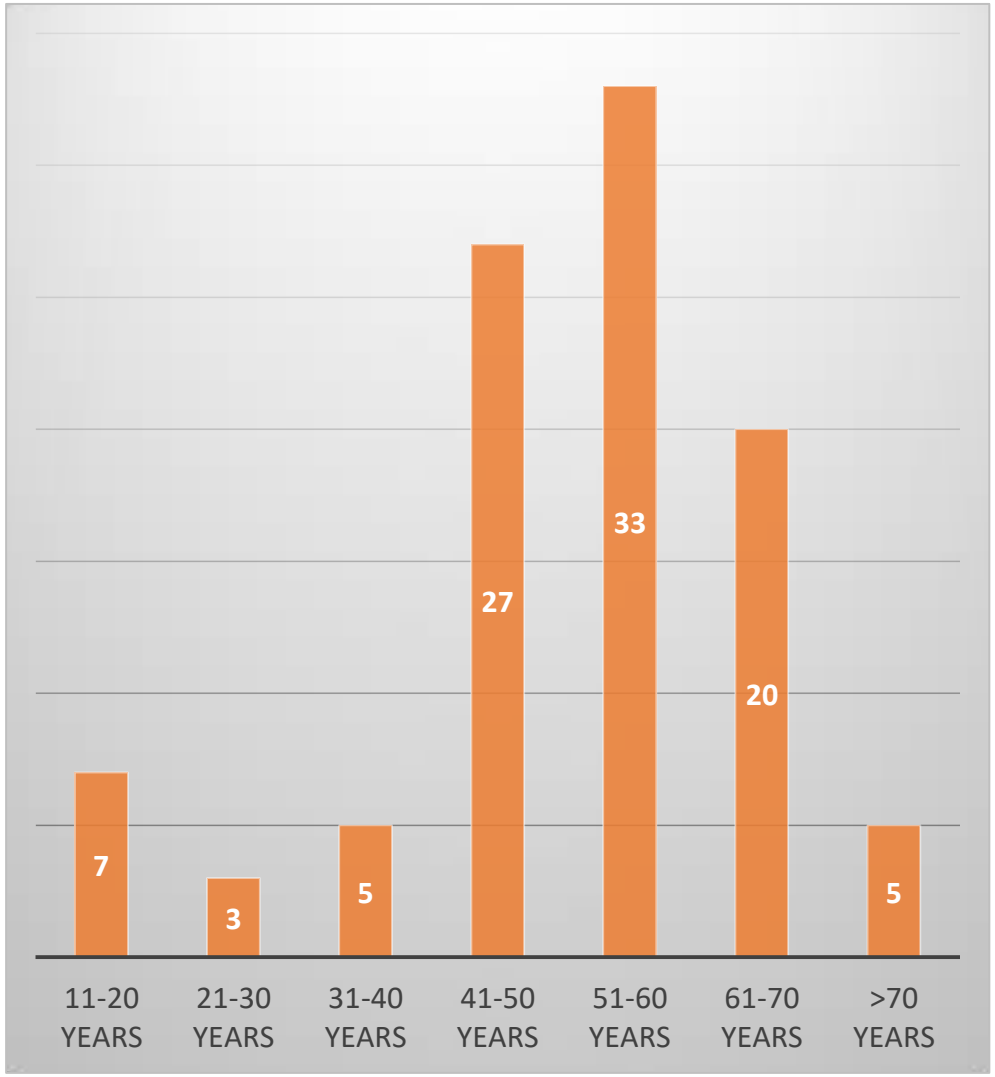
Total 100 patients fulfilling the inclusion criteria were included in the study.

Sex distribution of diabetic patients



Age distribution

Age group	Frequency
11-20	7
21-30	3
31-40	5
41-50	27
51-60	33
61-70	20
>70	5

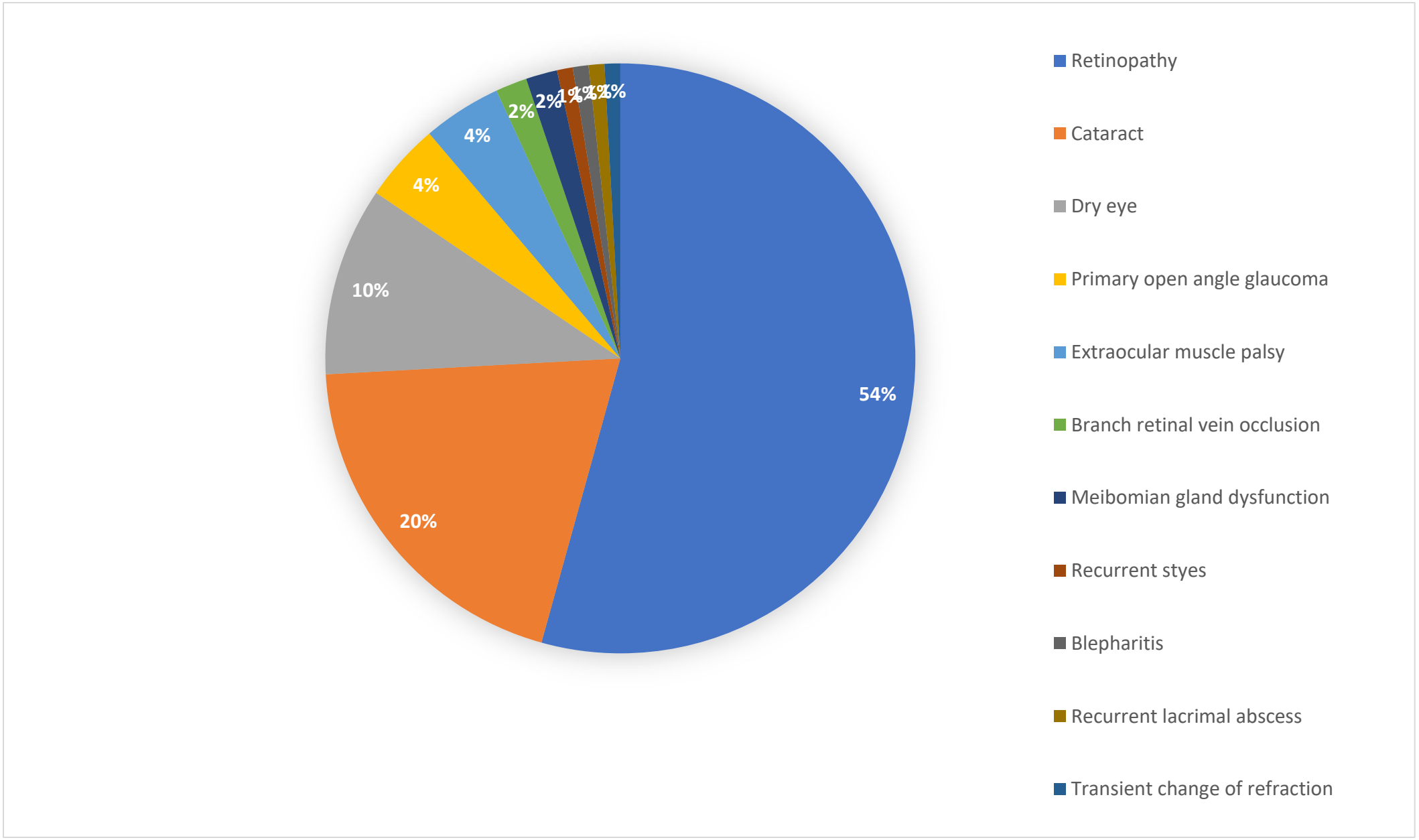


Ocular complications and frequency of occurrence

OCULAR COMPLICATIONS	FREQUENCY
Retinopathy	54
Cataract	20
Dry eye	10
Primary open angle glaucoma(POAG)	4
Extraocular muscle palsy	4
Branch retinal vein occlusion(BRVO)	2
Meibomian gland dysfunction(MGD)	2
Recurrent styes	1
Blepharitis	1
Recurrent lacrimal abscess	1
Transient change of refraction	1

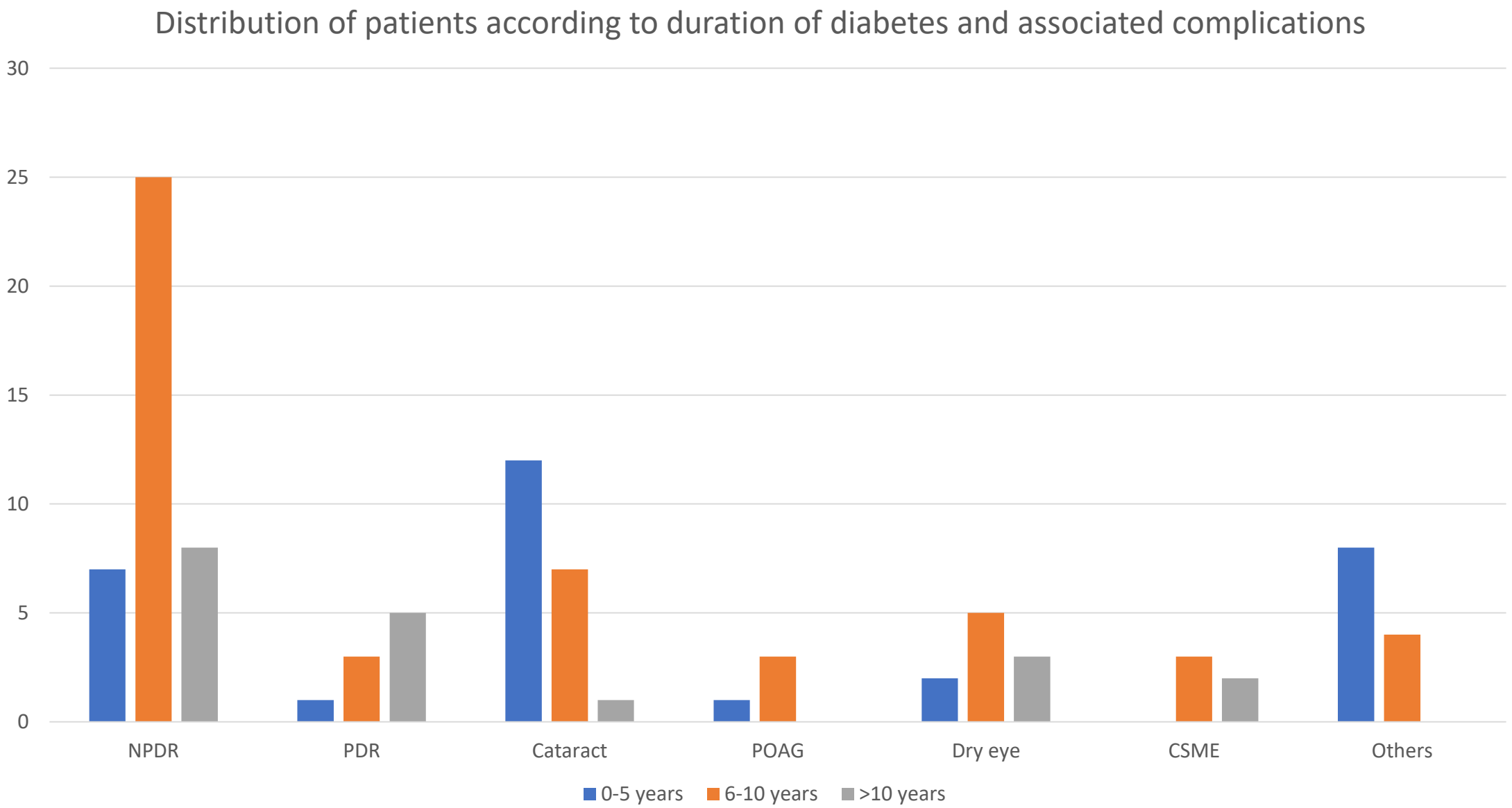
Recurrent styes,blepharitis,MGD,recurrent lacrimal abscess,transient change of refraction,extraocular muscle palsy ,BRVO are grouped under OTHERS for ease of statistical analysis.

Ocular complications and their frequency of occurrence



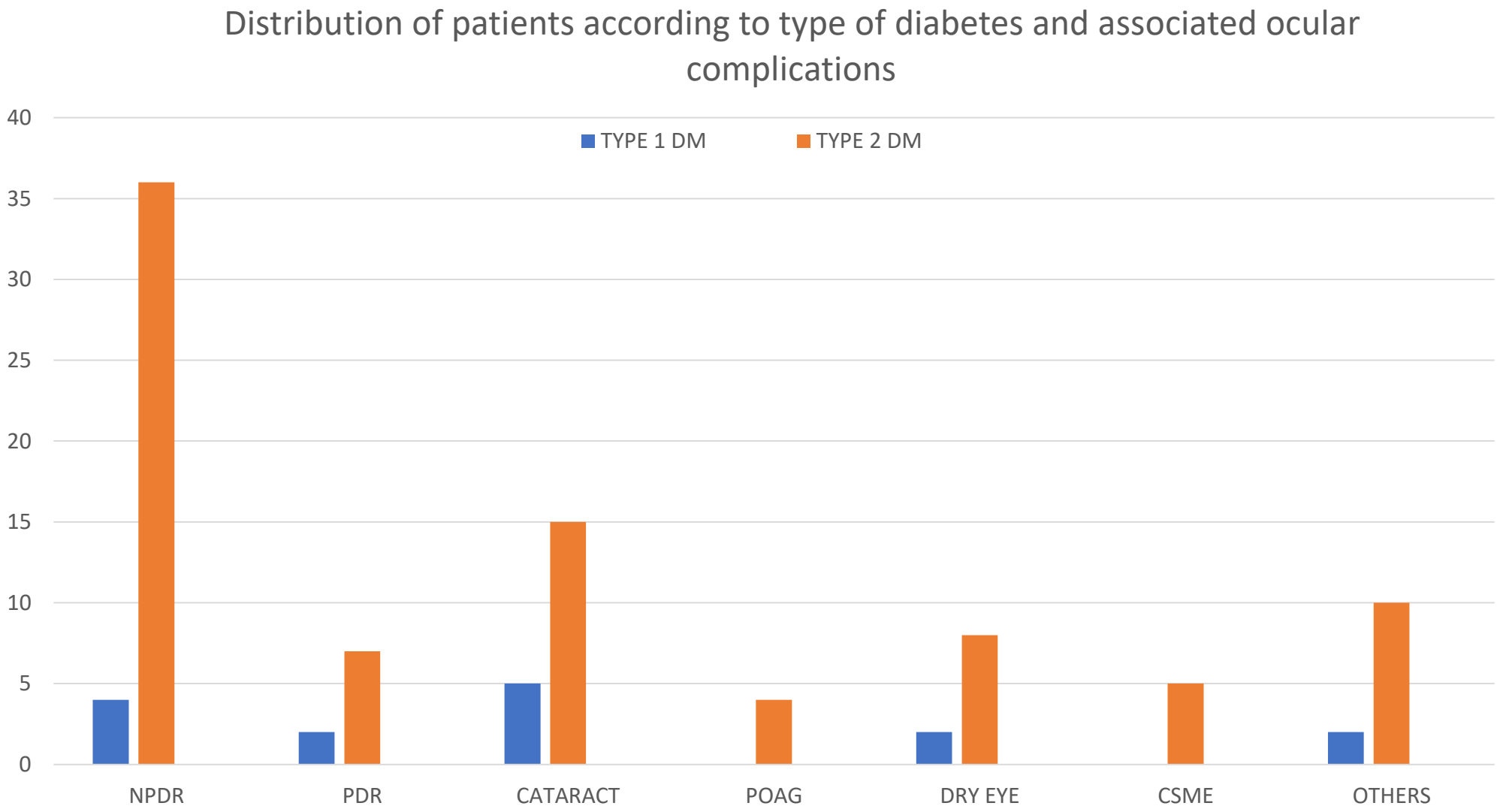
Distribution of patients according to duration of diabetes and associated ocular complications

DIAGNOSIS	0-5 years	5-10 years	>10 years	TOTAL
NPDR	7 (22.5%)	25(53.1%)	8(36.3%)	40
PDR	1(3.22%)	3(6.3%)	5(22.7%)	9
CATARACT	12(38.7%)	7(14.8%)	1(4.5%)	20
POAG	1(3.22%)	3(6.3%)	0	4
DRY EYE	2(6.4%)	5(10.6%)	3(13.6%)	10
CSME	0	3(6.3%)	2(9%)	5
OTHERS	8(25.8%)	4(8.5%)	0	12
TOTAL	**31**	**47**	**22**	**100**

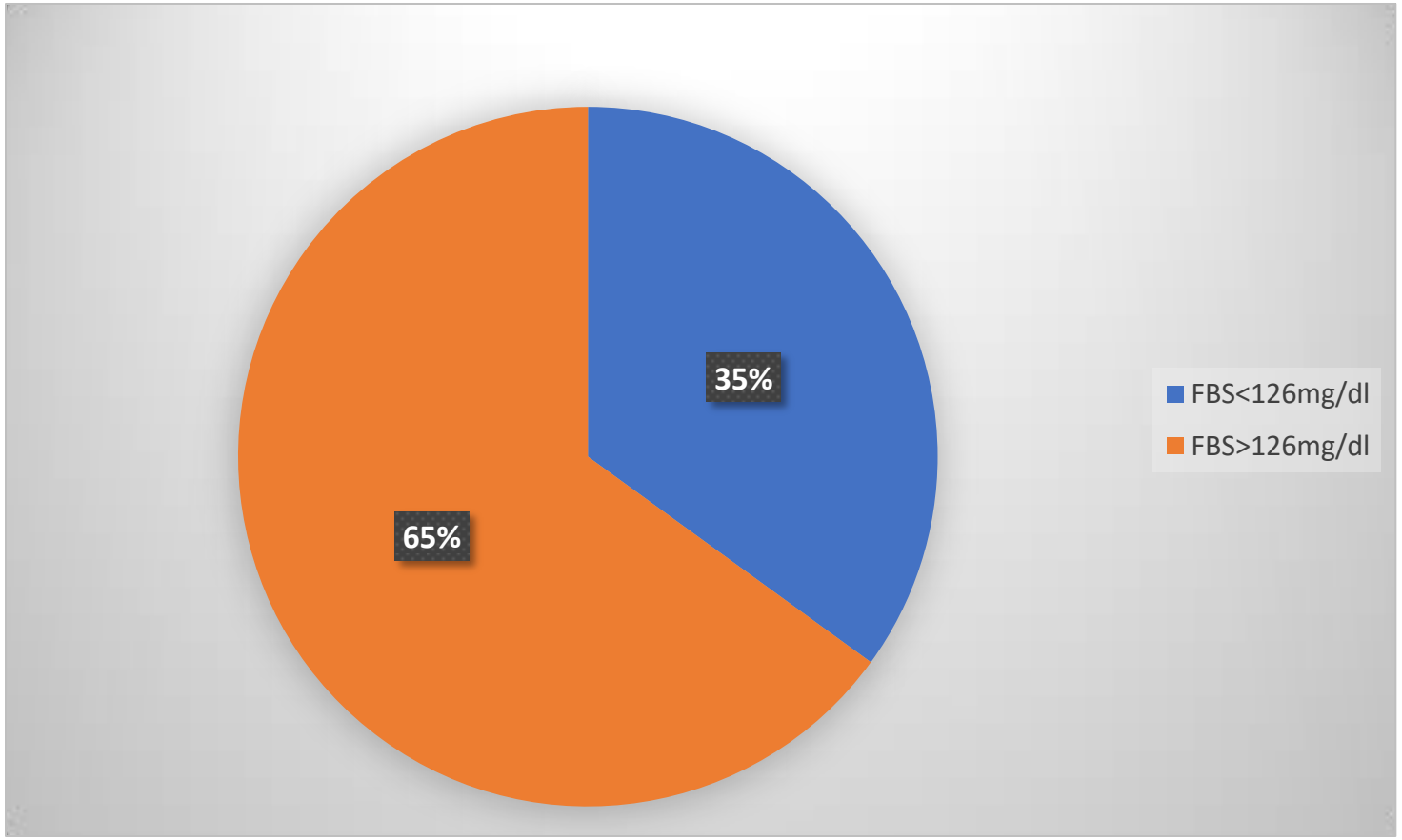

Distribution of patients according to duration of diabetes and associated complications
30
25
20
15
10
5
0
NPDR
PDR
Cataract
POAG
Dry eye
CSME
Others
0-5 years
6-10 years
>10 years

Distribution of patients according to type of diabetes and associated ocular complications

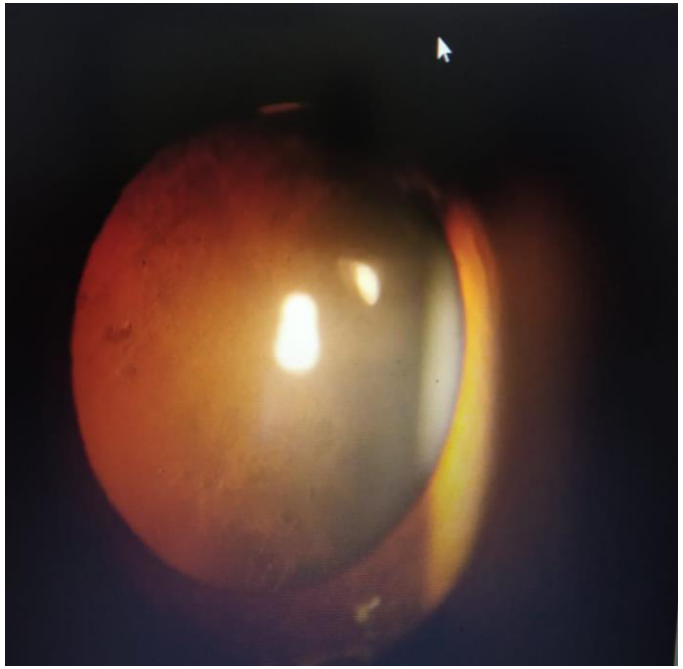
DIAGNOSIS	TYPE 1 DM	TYPE 2 DM	TOTAL
NPDR	4 (26.6%)	36 (42.3%)	40
PDR	2 (13.3%)	7 (8.2%)	9
CATARACT	5 (33.3%)	15 (17.6%)	20
POAG	0	4 (4.7%)	4
DRY EYE	2 (13.3%)	8 (9.4%)	10
CSME	0	5 (5.8%)	5
OTHERS	2 (13.3%)	10 (11.7%)	12
TOTAL	**15**	**85**	**100**


Distribution of patients according to type of diabetes and associated ocular complications
TYPE 1 DM
TYPE 2 DM
40
35
30
25
20
15
10
5
0
NPDR
PDR
CATARACT
POAG
DRY EYE
CSME
OTHERS

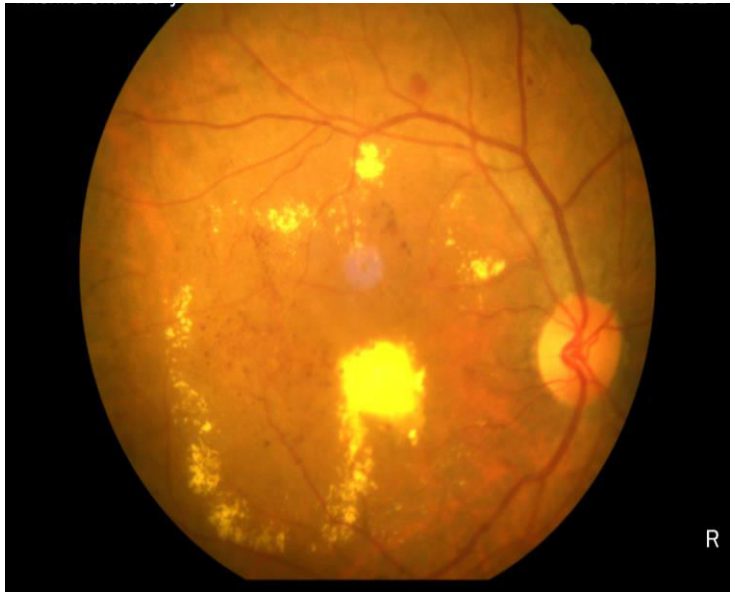
Control of diabetes vs ocular complications



Non proliferative diabetic retinopathy



Posterior subcapsular cataract



Clinically significant macular edema

DISCUSSION:

- In our study most of the patients were found in the age group 51-60 years (33%).
- In our study we found Retinopathy to be the most common ocular complication (54%).
- Prevalence of cataract was found to be (20%) followed by Dry eye (10%) , primary open angle glaucoma (4%) and extraocular muscle palsy (4%).
- In our study we found there is significant association between duration of diabetes and associated ocular complications ($p>0.05$).
- The most notable complications seen with increased duration of diabetes was NPDR (seen in 53.1% subjects with diabetes for 6-10 year duration). Increased incidence of retinopathy with increase in duration of diabetes (type1 and type 2) was noted in studies conducted by Klein et al(4) and Yanko et al (5)
- Increased incidence of CSME was noted as the duration of diabetes increased (6.3% of subjects with diabetes in the duration range of 6-10yrs had CSME while 9% of subjects with diabetes in the duration range of >10 years had CSME. Similar increased incidence of CSME with increased duration of diabetes was noted in a study by Varma et al. (6)

- In our study 26.6% of patients with type 1 diabetes mellitus had NPDR while 42.3% of patients with type 2 diabetes mellitus had NPDR. The prevalence of NPDR was higher in type 2 diabetes subjects, while the prevalence of PDR was higher in subjects with type 1 diabetes (13.3%)
- We found 5.8% of type 2 diabetes subjects having CSME while none of the subjects with type 1 diabetes had CSME . The prevalence of maculopathy was remarkably high (42% in type 1 and 53% in type 2 diabetic patients) in a study conducted by zander et al (7)
- In our study we noted that patients with good control of diabetes i.e FBS<126mg/dl had lesser prevalence of ocular complications (35%) than patients with FBS>126mg/dl (65%)

CONCLUSION:

- Diabetic retinopathy is the commonest ocular complication of diabetes followed by cataract and dry eye .
- Non proliferative diabetic retinopathy was more common in type 2 diabetes subjects as compared to type 1 diabetes subjects
- Proliferative diabetic retinopathy was more common in type 1 diabetes mellitus, than in type 2 diabetes mellitus.
- The prevalence of maculopathy was greater in subjects with type 2 diabetes mellitus.
- Prevalence of diabetic retinopathy was higher in patients with longer duration of diabetes.
- Prevalence of ocular complications was higher in patients with FBS>126mg/dl.
- So It is imperative that all patients with diabetes should undergo routine ocular evaluation to diagnose these conditions early and reduce ocular morbidity.

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4) Klein R, Klein B, Moss S, et al: The Wisconsin epidemiologic study of diabetic retinopathy. XIV. Ten-year incidence and progression of diabetic retinopathy. Arch Ophthalmol 1994; 112:1217-1228.

5) Yanko L, Goldbourt U, Michaelson C, et al: Prevalence and 15-year incidence of retinopathy and associated characteristics in middle-aged and elderly diabetic men. Br J Ophthalmol 1983; 67:759-765.

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