ORIGINAL RESEARCH PAPER

Ophthalmology

STUDY OF THE ROLE OF FUNDUS FLUORESCEIN ANGIOGRAPHY IN THE DIGNOSIS OF DIABETIC RETINOPATHY

KEY WORDS: DR, NPDR, NVD, NVE, IRMA

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ABSTRACT

PURPOSE- to study the role of fundus fluorescein angiography in the diagnosis of diabetic retinopathy

MATERIAL AND METHODS- Ours was a hospital based study of 50 patients who were suffering from DR or had history of diabetes mellitus of more than 5 years. 32 (64%) patients had duration of diabetes > 15 years.

70 eyes had NPDR. 42 (84%) patients had bilateral retinopathy.

On FFA microaneurysm was seen in 93% eyes. Capillary non perfusion was seen in 40% eyes. NVD/NVE was seen in 26% cases. IRMA was found in 12% eyes.

INTRODUCTION-

Diabetes mellitus causes many changes in eye and longer the duration more are the chances of having diabetic retinopathy. These retinopathy changes are visible in whole retina as diabetes is a microangiopathy affecting the retinal vasculature. Mohan et al (1992) in their study reported that proteinuria and serum creatinine levels are an excellent predictor of proliferative retinopathy[1].

FFA technique is a very helpful investigating modality to study the progression of diabetic retinopathy. Bresnick et al (1987) studied the progression of diabetic retinopathy using FFA[2].

MATERIAL AND METHODS-

Our study was a hospital based prospective study of 50 patients. Technical approval for the study was taken from Institutional Ethics Committee.

Inclusion Criteria –

1. Patients of diabetic retinopathy referred to our ophthalmology OPD with history of diabetic retinopathy or diabetes mellitus of long duration (more than 5 years).
2. Those attending eye OPD for routine checkup and diagnosed as diabetic on examination.
3. Patients attending diabetic clinic in Medicine OPD and referred to the eye OPD by the consulting doctors.

Exclusion Criteria –

1. Patients with diseases preventing adequate fundus examination as in dense cataract, vitreous haemorrhage, corneal opacities were not taken for the study.
2. Patients who were not fit medically for fundus fluorescein angiography or having any history of drug allergy were excluded from the study.

All patients underwent a detailed and comprehensive ocular examination by torch light and on slit lamp. IOP was recorded in all cases.

Detailed fundus examination was done by direct and indirect ophthalmoscopy, 90 D examination. Fundus photography was done in all cases. FFA was done in all patients in the study group to study changes of diabetic retinopathy. Necessary blood investigations as required were done. Diabetic Retinopathy was graded using ETDRS classification after doing FFA.

Observation-

Our study included 50 patients suffering from diabetes mellitus. 76% patients were in the age group of >50 years while 24% were less than 50 years (see table no. 1).

Table No. 1- Distribution Of Diabetic Retinopathy In Reference To Age (n=50 Patients)

S. NO.	Age Group	No. Of Patients	Percentage (%)
1	<30 yrs	01	2
2	30-40 yrs	01	2
3	41-50 yrs	10	20
4	51-60 yrs	18	36
5	>60yrs	20	40
TOTAL		50	100

32(64%) patients had long history of diabetes of more than 15 years duration. 42(82%) out of 50 patients had bilateral retinopathy while only 8 (16%) had unilateral involvement. 26% of eyes had proliferative diabetic retinopathy (see table no. 2).

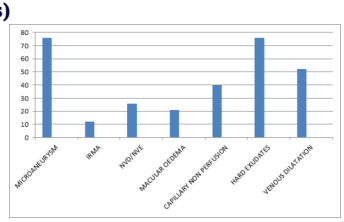
Table No. 2- Prevalence Of Diabetic Retinopathy According To Duration Of Diabetes (n= 50 Patients)

S. NO.	Duration Of Diabetes	No. Of Patients	Percentage (%)
1	<5 yrs	01	2
2	5-10yrs	05	10
3	10-15yrs	12	24
4	>15 yrs	32	64
TOTAL		50	100

The most common lesion found on fluorescein angiography was micro aneurysms seen in 93% of eyes. Hypofluorescent lesions corresponding to retinal haemorrhages and hard exudates were evident in 76% cases. Areas of retinal capillary non-perfusion (Drop-out areas) could be made on FFA in 40% of eyes. Other changes found were venous dilatation and beading seen in 52% of eyes. Hyperfluorescence suggesting leakage from new vessesls (NVD/NVE) was seen in 26% cases, confirming the diagnosis of proliferative retinopthy. IRMA were found in 12% of eyes and their differentiation from neovascularization was facilitated by their angiographic appearance.

21% eyes showed hyperfluorescence of the macular area in the late venous phase proving the clinical diagnosis of clinically significant macular oedem (CSME). No cases with macular ischaemia leading to macular oedema were found in our study. (see figure no. 1)

Figure No. 1- Fundus Findings On FFA In Study Group (n=100 Eyes)



54% of eyes were advised laser therapy while 41% were medically managed while 5 eyes were advised vitrectomy surgeries.

DISCUSSION-

In our study majority of diabetic retinopathy were in the age group of more than 50 years(76%) while 24% were less than 50 years of age. This result of our study is comparable to Bajpai et al (1979) who in their study found peak incidence in age group 51-60 years[3].

Klein R et al (1992) found that in Type 1 DM, <5yr of duration rarely causes DR while 5-10 years of duration causes DR in 27% of patients and >10 years of duration causes DR in 71-90% patients[4].

In our study 64% patients with DR had long history of diabetes >15 years duration.

In our study 42(84%) patients had bilateral retinopathy. Chew et al (1995) in their study concluded that diabetic retinopthy is predominantly bilateral[5].

In our study 26% had proliferative DR and this result is comparable with study of Bresnick GH et al (2004)[6].

In our study 52% eyes show microaneurysms on ophthalmoscopy while 76% eyes show microaneurysms on FFA showing 1.45 times higher accuracy as compared to ophthalmoscopy. 18% eyes showed neovascularity on ophthalmoscopy while 26% eyes showed neovascularity on FFA and 20% eyes showed area of capillary non perfusion in comparison to 44% eyes showed area of capillary non perfusion on FFA. This result is comparable with study of Abraham Chandran (2003) who in their study found macular edema in 60% while capillary non perfusion was seen in 8%[7].

CONCLUSION-

FFA is a very helpful investigating modality in studying the fundus changes in diabetes patients. FFA goes a long way in monitoring the progression of DR as well as is very helpful procedure in management of patients with DR.

REFERENCES-

1- Mohan R, Mohan V, Ramchandran A, Viswanathan M. Retinopathy in IDDM in South India. J. Assoc physicians India. 1987 Jun,37,370-3.
2- Bresnick MD: Diabetic maculopathy. A critical review highlighting diffuse macular edema. Ophthalmology. Nov 1983,Vol. 90,Nov. 11.
3- Bajpai H. S., Mehra, K.S., Singh V.P., Tikko S.K. and associates 1979 – diabetic retinopathy (a clinicopathological study) Ind. J. Ophthalmol 27(111), 12, 1979
4- Klein R, Klein BE, Moss SE. Epidemiology of proliferative diabetic retinopathy. Diabetes Care. 1992 Dec; 15(12): 1875–1891
5- Chew EY, Ferris FL, 3rd, Csaky KG, Murphy RP, Argon E, Thompson DJ, et al. The long term effects of laser photocoagulation treatment in patients with diabetic retinopathy: the early treatment diabetic retinopathy follow-up study. Ophthalmology 2003; 110(9): 1683-9.
6- Bresnick GH, Davis MD, Myers FL, de Venecia G. Clinicopathologic correlations in diabetic retinopathy. II. Clinical and histologic appearances of retinal capillary microaneurysms. Arch Ophthalmol. 1977 Jul; 95(7): 1215–1220.
7- Abraham Chandran: Fluorescein angiography and argon laser photocoagulation in the management of diabetic maculopathy; Indian J. Ophthalmology. 1983,31:227-5