



EFFICACY OF FUNDUS FLUORESCIN ANGIOGRAPHY IN POSTERIOR SEGMENT LESIONS DIAGNOSIS

Ophthalmology

Dr. M. S. S. Keerthi*

M.S Ophthalmology Assistant Professor Dept of Ophthalmology, ASRAM medical college, Eluru. *Corresponding Author

Dr. Venkata Bindu. Nekkanti

3rd year Postgraduate ASRAM medical college, Eluru.

ABSTRACT

INTRODUCTION: Fundus Fluorescein Angiography (FFA) is useful in the diagnosis of retinal, choroidal and optic nerve disorders. The basic principle of fluorescein depends on the dye's ability to absorb short

Wave lengths in the visible spectrum when stimulated, and then emit this energy as longer Wave lengths.

MATERIAL AND METHODS: Study was done on 50 patients of both sexes and various age groups attending the OPD. Fundus photos were taken. Fluorescein dye was injected and fundus pictures were taken.

RESULTS: Out of 50 cases, 22 were males (44%) and 28 were females (66%). Male to female ratio is 1:1.5. Out of 50 cases 24 cases were diagnosed using ophthalmoscopy and 26 cases were diagnosed using FFA. Out of 50 cases, 13 cases are diagnosed as Non Proliferative diabetic retinopathy (PDR) on ophthalmoscopic examination. Out of 13 cases on doing FFA, 7 cases are diagnosed as PDR and 4 are diagnosed as NPDR with CSME.

In this study 8 cases are Cystoid macular edema. Out of 8 cases only 2 cases were diagnosed by ophthalmoscopic examination, remaining 6 cases were diagnosed on doing FFA. In cases of CRVO, BRVO, ARMD and CSCR fluorescein angiography helped in confirming the diagnosis, to detect macular edema and in diagnosing the extent of macular edema.

CONCLUSION: There is no doubt that, FFA is useful to study from the very subtle stages which cannot be delineated by the traditional ophthalmoscopic examination. The effort will produce results that are gratifying and valuable.

KEYWORDS

Fundus fluorescein angiography, retina, ophthalmoscopy.

INTRODUCTION

Fundus Fluorescein Angiography (FFA) is an imaging test that highlights the retinal and choroidal circulation and is useful in the diagnosis of retinal, choroidal and optic nerve disorders. Advantages of FFA are retinal changes can be detected in the early stages, progression of various disease entities, treatment modalities can be decided and guidance during laser treatment is afforded. Photographs of the retina are taken after intravenous injection of sodium fluorescein. It is primarily eliminated through the liver and kidneys within 24–36 hours via the urine. 80% of the fluorescein is not available for fluorescence as it is protein-bound, primarily to albumin, and the remaining 20% is unbound and can be visualized as it circulates in the vasculature and tissues of the retina and choroid.

Fluorescence occurs when a molecule is excited by certain wavelength light that raises the molecule to a higher energy state. Then it comes back to its original state by releasing a photon. The basic principle of fluorescein depends on the ability of the dye to absorb short wavelengths in the visible spectrum when stimulated and emit this energy as longer wavelengths. Fluorescein dye absorption peak of is between 465nm - 490nm (blue) and emission peak is between 520nm - 530nm (green). To allow maximal absorption a blue filter (excitation filter) is placed in front of flash of fundus camera. This allows only the blue light to enter the eye and strikes the dye molecules circulating in the retinal and choroidal blood vessels. It is absorbed and reemitted as green light. In addition to this, part of blue light which is reflected from fundus structures leaves the patients eye and travels back to fundus camera. This reflected blue light is prevented from striking the film by placing a barrier filter in front of film. This barrier filter allows only green light to pass through. Thus the light that strikes the film is only true emitted fluorescent light.

MATERIALS AND METHODS

Our study included 50 patients who visited ophthalmic OPD of ASRAM Medical college, Eluru from March 2018 to February 2019. A detailed history of general condition was taken and if needed physician opinion was sought regarding fitness for procedure. For all diabetic patients, blood sugar estimations and renal function tests - blood urea, serum creatinine were done and angiography done only when they are within normal limits.

Aim Of The Study

- The aim of the study is
- To evaluate the posterior segment lesions of the eyes using fundus

fluorescein angiography.

- To assess its usefulness in arriving at the diagnosis.
- To understand the pathology of disease.
- To plan the treatment modalities.

FFA was offered to patients with reasonably clear media. A written consent was taken.

RESULTS

Study was done on 50 patients of both sexes and various age groups attending the out patient department of ASRAM Medical College, Eluru.

Out of 50 cases, 13 cases are diagnosed as Non Proliferative diabetic retinopathy on ophthalmoscopic examination. Out of 13 cases on doing fluorescein angiography, 7 cases are diagnosed as Proliferative diabetic retinopathy and 4 are diagnosed as NPDR with CSME.

In this study 8 cases are Cystoid macular edema. Out of 8 cases only 2 cases were diagnosed by ophthalmoscopic examination, remaining 6 cases were diagnosed on doing fluorescein angiography.

In cases of CRVO, BRVO, ARMD and CSCR fluorescein angiography helped in confirming the diagnosis, to detect macular edema and in diagnosing the extent of macular edema.

Table 1:-

Diagnosis	No.of cases
Diabetic Retinopathy	13
Branch retinal Vein Occlusion	7
Central Retinal Vein Occlusion	5
Central serous chorioretinopathy	5
Age Related Macular Degeneration	5
Polypoidal choroidal vasculopathy	1
Cystoid macular edema	10
Stargardts disease	1
Valsalva retinopathy	1
Active vasculitis	1
Vogt-Koynaki-Harada disease	1

OPHTHALMOSCOPIC FINDINGS VERSUS FFA FINDINGS**Table 2:- Diagnosis of fundus changes using Ophthalmoscopy and fluorescein Angiography**

No.of cases	Cases diagnosed by ophthalmoscopy	Cases diagnosed by using fluorescein angiography
50	24	26

Table 3:- Treatment advised of the affected eye after FFA

Treatment advised	Number
Observation and follow up	24
Medical	15
Laser	9
Surgery	2
Total	50

DISCUSSION

The goal of fluorescein angiography is to diagnose retinal pathologies, to detect lesions that are undiagnosed ophthalmoscopically, to detect the leaks and their extent and to guide in management.

In this study, out of 50 cases, 24 cases were diagnosed ophthalmoscopically and 26 were diagnosed by using fluorescein angiography.

Out of 50 cases, 22 were male (44%) and 28 were females (66%).

In this study out of 50 cases, 13 cases were diagnosed as Non proliferative diabetic retinopathy. Out of 13 cases on doing fluorescein angiography, 7 cases are diagnosed as Proliferative diabetic retinopathy and 4 are diagnosed as NPDR with CSME. Capillary non perfusion areas can be detected using fluorescein angiography that is not visible on ophthalmoscopy.

In this study 8 cases are Cystoid macular edema. Out of 8 cases only 2 cases were diagnosed by ophthalmoscopic examination, remaining 6 cases were diagnosed on doing fluorescein angiography.

It is useful for diagnosing retinal pathologies, to diagnose the lesions that are undiagnosed on ophthalmoscopy and guided in treatment.

CONCLUSION

Fundus fluorescein is a highly specialized form of ophthalmic photography that is used to require sophisticated equipment and specialized photographic techniques. Recent technological advances improved its safety and patient acceptability, in storage, analysis and retrieval of results and in monitoring disease progress.

Based on fluorescein angiography it is possible to detect early changes in the retina that are not visible on ophthalmoscopic examination. It is also useful in confirming the diagnosis, diagnosing the disease and to know the extent of the lesion. It is also helps in knowing the progress of the disease. It helps in deciding treatment modality and guides us during the laser therapy. Fluorescein angiography acts as baseline for documenting the pathological conditions of retina, its progression, its response to treatment and guide for further reference.

As regards to Diabetic Retinopathy which formed major part of our study Fluorescein angiography helped in diagnosing ophthalmoscopically undiagnosed cases and also helped in confirming the diagnosis in those cases that are diagnosed clinically. Angiography is useful to determine if macular thickening is due to focal leak or diffuse leak and location of the leak so that laser photocoagulation can be planned accordingly. It is useful to differentiate between IRMA's and neovascularization elsewhere and in defining well cases of capillary dropouts.

In CSCR it helped to confirm the diagnosis and in pointing the point of leak thereby helping in planning our management.

Fluorescein angiography helped in venous occlusions in confirming diagnosis, grading the degree of ischemia depending upon the extent of capillary non perfusion, in detecting the complications like macular edema, neovascularization elsewhere.

In cases of cystoid macular edema fluorescein angiography helped to make the diagnosis, confirm the diagnosis that are diagnosed clinically and to know the extent of edema.

There is no doubt that, fluorescein angiography is useful to study from the very subtle stages which cannot be delineated by the traditional ophthalmoscopic examination. The effort will produce results that are gratifying and valuable.

REFERENCES

- 1) Principles and practice of Ophthalmology, vol. 2, Payman GA, Sanders DR. GoldrergMF(eds.); Philadelphia, 1980, WE Sanders Co.pp.
- 2) Textbook of clinical ophthalmology, Jack J Kanski.
- 3) Fluorescein angiography - A users manual 2003, Hem K Tewari, Lalit Venna, Pradeep Venkatesh,
- 4) The Sankar Netralaya atlas of "fundus fluorescein angiography.
- 5) Ophthalmic photography- ophthalmic technical skills series, J Michae"Coppinge MA CM, Mark Maio, Kirby Miller CRA.
- 6) Amresh Chopdar - fundus fluorescein angiography.
- 7) Landmarks in the Historical Development of Fluorescein Angiography Patrick J. Same, M.Ed., CRA , Davis Duehr Eye Associates, Madison, WI,Journal of Ophthalmic Photography Vol.15, No. 1 April 1993,17-23
- 8) Behrendt T: Extravascular fluorescence and intravascular fluorescence in fluorescein angiography chap. In clinical ophthalmology , Duane-vol 3.
- 9) Haining W: advanced techniques for fluorescein angiography, arch ophthalmology 79, 10-15
- 10) Early treatment diabetic retinopathy research group, report no. 13, fluorescein angiographic, risk factors for progression of diabetic retinopathy, ophthalmology 1991, 98, 834-840.
- 11) Central vein occlusion study: Arch ophthalmol 1993, 111, 1087-1095.
- 12) Levine R, Brucker A, Robinson F: Long term follow up of idiopathic central Serous chorioretinopathy by fluorescein angiography, ophthalmology 1989, 96, 854-859.
- 13) The normal fundus fluorescein angiogram. III. A longitudinal fluorescein angiographic study of the fundus in insulin dependent diabetics without ophthalmoscopically abnormalities. Acta ophthal 1985 Jun;63(3):311-4.
- 14) Zhonghua Yan Ki Za Zhi 2008 Jan;44(1):12-6. Comparison of fundus photography and Fluorescein angiography in grading diabetic retinopathy
- 15) Int ophthalmol 2007 Apr-Jun;27(2-3):155-61. Epub 2007 Jan 26. Fluorescein fundus angiographic findings in Vogt-Koyanagi-Harada syndrome. Arellanes-García L, Hernández-Barrios M, Fromow-Guerra J, Cervantes-Fanning