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Research Article

**MANIFESTATION TRAITS OF FUNDUS FLUORESCENCE
ANGIOGRAPHY IN DIAGNOSIS OF DIABETIC RETINOPATHY**

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Abstract:

Objective: The aim of this research work is to interrogate the manifestation traits of Fundus Fluorescence Angiography and values of this procedure in the diagnosis of diabetic retinopathy through its comparison with the procedure of direct ophthalmoscopy. **Methodology:** 250 patients (Five hundred eyes) who were under suspicion of having diabetic retinopathy and got admission in Allied Hospital Faisalabad from March 2017 to January 2019 were the part of this research work. All the patients had to undergo fundus fluorescence angiography and direct ophthalmoscopy. We summarized the manifestation traits of fundus fluorescence angiography in detection of diabetic retinopathy. Then, we provide the comparison of the two examination procedures. **Results:** In detection with the procedure of direct ophthalmoscopy, three hundred and seventy-five eyes out of five hundred eyes were present with diabetic retinopathy (75.0%); Seventy-four eyes were at Stage-1, eighty-eight eyes were at Stage-2, ninety-two eyes were at Stage-3, eighty-three eyes in Stage-4, twenty-eight eyes at Stage-5 and ten eyes were in Stage-6. In diagnosis with the method of fundus fluorescence angiography, four hundred and sixty-five eyes out of total five hundred eyes were present with diabetic retinopathy (93.0%); ninety-four eyes were at Stage-1, one hundred and ten eyes at Stage-2, one hundred and twelve eyes at Stage-3, ninety-two eyes were at Stage-4, forty-one eyes at Stage-5 and sixteen eyes were at Stage-6. The rate of detection of diabetic retinopathy with the utilization of fundus fluorescence angiography was much high as compared to the detection rate with the utilization of direct ophthalmoscopy ($P < 0.050$). Fundus Fluorescence Angiography discovered that three hundred and sixteen eyes were present as non-proliferative retinopathy (67.960%), seventy-five eyes were present with pre-proliferative lesions (16.130%), one hundred and forty-nine eyes were present with proliferative lesions (32.040%), one hundred and thirty-five eyes were present with diabetic maculopathy (29.030%) and thirty-one eyes were present with the Diabetic Optic Disc Lesions (6.670%). **Conclusion:** The rate of detection of diabetic retinopathy with the utilization of fundus fluorescence angiography is much high as compared to the detection rate by direct ophthalmoscopy. Fundus Fluorescence Angiography has the ability to determine the clinical stage precisely.

Keywords: Diabetic Optic Disc Lesions, Fundus Fluorescence Angiography, Diabetic Retinopathy, Rate of Detection, Lesions, Abrasions.

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INTRODUCTION:

There is high rate of mortality as well as morbidity among patients suffering from diabetes. This is also very common complication in populations of modern countries. diabetic retinopathy is very severe complication in diabetics as well as it results into the blindness of these patients. It is very difficult to diagnose the diabetic retinopathy in early stages. Report showed that the rate of prevalence of diabetic retinopathy in the patients suffering from diabetes for complete 5 years was from 49.0% to 58.0%. So, timely identification of the diabetic retinopathy has much significance for medical treatment and advancement in the field of prognosis. Direct ophthalmoscopy is very significant approach of diagnosis for the detection of diabetic retinopathy. Fundus Fluorescence Angiography revolutionized this diagnosis with its preciseness and accuracy. In this procedure, fundus Photograph was made under the optical filter of special nature. Photograph lasted in complete process of the fundus blood circulation as images of fundus at various time points and parts are the requirement for the experimental examination. There are many research works concerning the procedure of fundus fluorescence angiography. Cecilia S discovered that there was much stronger function of fundus fluorescence angiography than the Spectral Domain Optical Coherence Tomography in assessment of the IRMA (Immune-Radio Metric Assay) and NVE (Neovascularization Elsewhere). Wang Yongcheng discovered that fundus fluorescence angiography has capability to discover different micro vascular damages, degree of damage and retinal ischemia in initial stage.

METHODOLOGY:

Total 250 patients suffering from diabetic retinopathy who got admission in Allied Hospital Faisalabad from March 2017 to January 2019 were the part of this research work. All of the patients fulfilled the international standard of diabetic retinopathy prescribed in 2003. Patients who were suffering from some other serious complications were not the part of this research work. One hundred and forty-five patients were male and one hundred and five patients were females. The range of the age of patients was from 34 years to 84 years with an average age of 54.320 ± 3.220 years. Out of total 250 patients, sixty-three patients were having more than sixty year of age, the age of eighty-eight patients were from 50 to

59 years, sixty-seven present in the age group having age from 40 to 49 years and thirty-two patients were in their fourth decade of life. These patients were having the duration of diabetes from 2 months to twenty-eight years with a mean duration of 8.720 ± 2.370 years. Ethical committee of the institute gave the permission to conduct this research work. We took the written consent from all the patients.

We performed the direct ophthalmoscopy and fundus fluorescence angiography for all the patients according to the prescribed standards present in the international literature. Same specialist performed the both procedures to get rid of any bias in the findings. We did not observe the proportion of microangioma, exudation's category and availability of new vessels, detachment of retina and fibro vascular proliferation. We recorded the number of patients of abrasions identified by to diagnosing methods and corresponding stages. We also concluded the manifestation traits of diabetic retinopathy in the method of fundus fluorescence angiography. We followed the 6 stages of diabetic retinopathy in accordance with the formulation of NACFD (National Academic Conference of Fundus Diseases) (1985). diabetic retinopathy at stage 1, 2 and 3 was non-proliferative diabetic retinopathy whereas diabetic retinopathy at stage 4, 5 and 6 was proliferative diabetic retinopathy. We used the SPSS V. 23 for the statistical analysis of the collected information. We considered the differences as statistical significant if the P value was 0.050.

RESULTS:

We diagnosed 375 eyes with diabetic retinopathy with the use of direct ophthalmoscopy (75.0%). Total 465 eyes were present with diabetic retinopathy by fundus fluorescence angiography (93.0%). This disparity among these 2 methods of diagnosis in the rate of detection of diabetic retinopathy is much significant ($P < 0.050$; Table-1). Total 465 eyes were present with diabetic retinopathy by fundus fluorescence angiography, among them, three hundred and sixteen eyes were as non-proliferative diabetic retinopathy (67.960%); the most important manifestations of this retinopathy in fundus fluorescence angiography included angiotelectasis, non-perfusion and microangioma in macular temple, and there might be presence of abrasions in optic disk on nose side and upper and lower hemal arches.

Table-I: Comparison Of Fundus Fluorescence Angiography And Direct Ophthalmoscopy Results

Examination method		Direct Ophthalmoscopy	Fundus Fluorescence Angiography	Xr	P
Number of cases		500.0	500.0	-	-
Without DR		125.0	35.0	-	-
Non-proliferative	I	74.0	94.0	-	-
	II	88.0	110.0	-	-
	III	92.0	112.0	-	-
	IV	83.0	92.0	-	-
Proliferative	V	28.0	41.0	-	-
	VI	10.0	16.0	-	-
Rate of lesions		75.0%	93.0%	69.174	0

Total seventy-five eyes were present with pre-proliferative diabetic retinopathy (16.130%). The major manifestations of this retinopathy in Fundus Fluorescence Angiography included severe hemorrhage of retina in all 4 quadrants, venous bleeding in 2 quadrants and non-availability of wide range of capillary perfusion region. There were one hundred and forty-nine eyes of proliferative diabetic retinopathy (32.040%), the major manifestation was the new vessels proliferation. There were one hundred and thirty-five eyes of diabetic maculopathy (29.030%). Most important manifestation was macular ischemia and macular edema. Total thirty-one eyes were present with the diabetic papillopathy (6.670%).

Fundus Fluorescence Angiography corrected 20 eyes at Stage-1 of diabetic retinopathy, twenty-two eyes Stage-2 of diabetic retinopathy, twenty eyes at Stage-3 of diabetic retinopathy, nine eyes at Stage-4 of diabetic retinopathy, thirteen eyes at Stage-5 of diabetic retinopathy and six eyes at Stage-6 of diabetic retinopathy. the diagnosis of other 105 carried out without diabetic retinopathy under the mydriasis fundus copy; fundus fluorescence angiography corrected the 90 eyes (72.0%).

DISCUSSION:

Diabetic retinopathy screening is much essential for proper treatment. There should be a regular examination of eyes of the patients suffering from diabetes for early diagnosis and treatment of diabetic retinopathy. Ophthalmoscopy is the traditional method for screening of diabetic retinopathy. Early pathological alterations of retina importantly manifest as microangiopathy. Currently, fundus fluorescence angiography is the modern method for examination of diabetic retinopathy. by the use of this method; we can understand correctly the condition and circulation of blood in the vessels of retina with the examination of the condition of fluorescence in the circulation of blood. It has the ability to discover the diabetic retinopathy in very short duration of time. The manifestations of retinopathy are as dotted fluorescence, capillary filling abnormalities and leakage of fluorescein. It also has the capability to assess the retinopathy severity and its tendency for development.

Zhao XQ stated that fundus fluorescence angiography could detect early pathological alterations which cannot be diagnosed with the utilization of ophthalmoscopy among patients who are suffering from diabetes for less than five years of life. In this research work, the rate of detection of

abrasions with the utilization of Fundus Fluorescence Angiography was much high as compared to the direct ophthalmoscope, this outcome is similar with the results of Wang XY.

One research work stated the microangioma as the initial and most frequent symptom of DR whereas some considered that most common was the capillary fluorescein leakage of sodium. In current research work, rate of occurrence of microangioma was 92.90%, and few patients with the diabetic retinopathy only manifested as microangioma of retina, proposing that microangioma was the initial sign of diabetic retinopathy which was much similar to the findings of the research work conducted by Lv Peilin.

CONCLUSION:

Fundus Fluorescence Angiography is highly precise, reliable and accurate method in the diagnosis of diabetic retinopathy. This method has the capability to assess the severity of diabetic retinopathy and its associated conditions to guide the laser targeted therapy in initial stages which require much time with high expenses. Fundus Fluorescence Angiography is much vital for the protection of the patient's vision as well as it relieve the patients from pain in the patients suffering from diabetes.

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