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Research Article

Compare the Result between Non Mydriatic Fundus Camera and Slit Lamp Biomicroscope in Diabetic Patients

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Abstract

Objective: To compare the result of non-mydriatic fundus camera with slit lamp biomicroscope in patients having diabetic mellitus according to age and gender distribution at AIEH.

Methodology: A proforma was designed in which all Variables were listed; to make sure to select the appropriate patient and not to miss out any details. Variables were selected in accordance with the aims and objectives of the study.

Results: On the bases of Sensitivity (for confirmation), Specificity (not confirmation), Positive predictive value (actually have a disease) and Negative predictive value (actually does not have a disease), the Optometrist 97.06% sure that the patient has Diabetic Retinopathy, 81.58% does not have Diabetic Retinopathy, 93.04%, if the test is positive that the patients actually have Diabetic Retinopathy, and there is 91.08% chance, if the test is negative means the patient does not have Diabetic Retinopathy however there is still 8.82% chance of false negative (patient do not have Diabetic Retinopathy) in Right eye. 99.04% sure that the person has disease, 85.71% is confirmed that the person doesn't have Diabetic Retinopathy, 95.41%, if the test is positive that the patients actually have Diabetic Retinopathy there is 96.77% chance, if the test is negative means the patient does not have Diabetic Retinopathy however there is still 3.22% chance of false negative (Patient do not have Diabetic Retinopathy) in Left eye.

Conclusion: Concluded that slit lamp biomicroscope is a standard test to detect the Diabetic Retinopathy.

Keywords: Diabetic Retinopathy; Nonmydriatic Fundus Camera; Slit Lamp Biomicroscope

Introduction

Worldwide diabetes is a major systematic disease that effects the body as well as eye health of a person in the world [1]. There is no specific treatment for this systemic disease, some home remedies effects secretion of insulin [2]. Loss of life's quality [3], community burden economically on the community and on the individual person and its family [4-7].

There are many lesions or group of lesions that compose together and form diabetic retinopathy that found in the posterior eye part (retina or fundus) individuals for several history of years. Some scientist e.g. Thylefors, Negrel, Pararajasegaram and Dadzie, analysis the globally data of WHO on blindness, results that the data through the survey on diabetic retinopathy about the causes of blindness is too limited or negligible. However, the diabetic retinopathy is a major systemic disease as a 4th cause of blindness worldwide, after few other eyes of systematic diseases e.g., cataract, the glaucoma and trachoma etc. [8].

Type II diabetes from all over the world, 21% approximately have diagnose retinopathy [9], and greater than 60% have diabetic retinopathy during the first two decades of the disease [10]. 177 million WHO, that the diabetics in the worldwide [11]. One person from 20 of population from world's adult population now suffers from diabetes [12]. Global increase attribution of diabetes to obesity and life style or daily activity in better diagnostic facilities and health care [13]. Above 60 years are patient or retired has diabetes or on risk of diabetes. Now a days young people are also affects on it and has diabetes high frequency [14]. Pakistan is also suffers from diabetes and exposed high ration of cases related to diabetic retinopathy.

Prevention of diabetic retinopathy

- **Primary level:** The prevention of diabetes, if possible, is the ideal. Attention should be focused on changes in lifestyle to reduce the risk of diabetes. Moreover, strict control of blood sugar levels reduces the risk of severe complications in a diabetic patient.
- **Secondary level:** All health workers should be trained to recognize the symptoms and signs of diabetes. People with non-insulin dependent diabetes should be examined for diabetic retinopathy, including clinically significant macular edema and proliferative disease, at the time of initial diagnosis. If no retinopathy is present, it is generally safe to wait 5 years before further ocular examination. Once diabetic retinopathy is detected, review should be yearly or more frequent depending on the severity of retinopathy. Insulin dependent diabetics should be examined within 3-5 year after onset of the condition and yearly thereafter.

A pregnant woman with pre-existing diabetes runs the risk of rapid progression of diabetic retinopathy. She should have a detailed ophthalmic examination early in pregnancy and follow up during the course of pregnancy. Laser treatment should be applied when high-risk characteristics are detected either clinically significant macular edema or neovascularization of the disc or elsewhere.

Tertiary level

The development of vitreous hemorrhage or traction retinal detachment requires referral to a tertiary management center where intra-ocular microsurgery can be performed. This is a highly skilled procedure requiring expensive equipment and is restricted to a small number of specialized centers. Depending on the financial realities of the community involved, transfer to a competent center should be considered.

Material and Methods

- **Study Design:** It was Observational, Descriptive Cross-Sectional study
- **Study location**: Diabetic eye clinic Al-Ibrahim Eye Hospital Karachi
- **Duration of study:** April to October (07 month)
- **Sample size:** 140 patients (calculated with Rao soft software)
- **Sampling technique:** All newly registered diabetic patients during data collection time were screened.

Inclusion criteria

All those subjects were included in study who visits 1st time diabetic clinic and have clear media for clear image of fundus photo.

Exclusion criteria

All those patients were excluded from my study who comes for follow-up and other those who have media opacity or dull glow.

Data collection procedure

A proforma was designed in which all Variables were listed; to make sure to select the appropriate patient and not to miss out any details. All Variables were consider according to all criteria (inclusion/exclusion, aims and object).

Data analysis

Data were analyzed by SPSS Version 20.0.

Ethical consideration

- Approval was taken from Director of Isra School of Optometry
- Approval was taken from executive Director of Al-Ibrahim Eye Hospital, Malir Karachi
- Prior verbal communication with staff of Diabetic eye clinic before data collection
- Verbal consent was taken from all participants.

Results

In this research the patients who is having diabetes are total number of 140, in which males are 77 while 63 are females

Gender	Frequency	Percent
Male	77	55.0
Female	63	45.0
Total	140	100.0

Table 1: Frequency of Male and Female.

We have two types of diabetes in which the number of patients who have type 1 diabetes are 27 and type 2 are 113.

Types of diabetes	Frequency	Percent
Type 1	27	19.3
Type 2	113	80.7
Total	140	100.0

Table 2: Frequency of type 1 and type 2 diabetes.

Total number of patients are 140 maximum range of diabetes in the duration of <5 years are 77(55.0%), where minimum range of duration are 16 years are 17(12.1%).

Duration of diabetes	Frequency	Percent
<5 Years	77	55.0
5-10 Years	34	24.3
11-15 Years	12	8.6
16 Years on words	17	12.1
Total	140	100.0

Table 3: Frequency of Duration of diabetic.

The total number of diabetic patients are 140 in which maximum age of DM are 70 years and the minimum age of DM are 22.

Age	
Total	140
Mean	51.24
Std. Deviation	10.122
Minimum	22
Maximum	70

Table 4: Age distribution.

We have found with the help of non-mydriatic fundus camera in right eye, the fundus photo diagnoses are the total number of patients 140 in which 106(75.7%) are no DR while rest of DR.

Fundus photo diagnoses right eye	Frequency	Percent
No DR	106	75.7
DR	34	24.3
Total	140	100.0

Table 5: Frequency of non-mydriatic fundus camera in right eye.

We have found with the help of non-mydriatic fundus camera in left eye, the fundus photo diagnoses are 109(77.9%) are no DR while rest of DR.

Fundus photo diagnoses left eye	Frequency	Percent
No DR	109	77.9
DR	31	22.1
Total	140	100

Table 6: Frequency of non-mydriatic fundus camera in left eye.

We have found with the help of slit lamp in right eye, slit lamp diagnoses are 102(72.9%) are no DR, while the rest of DR.

Slit lamp diagnoses of right eye	Frequency	Percent
No DR	102	72.9
DR	38	27.1
Total	140	100.0

Table 7: Frequency of slit lamp in right eye

We have found with the help of slit lamp in left eye, slit lamp diagnoses are 105(75.0%) are no DR while rest of DR.

Slit lamp diagnoses of left eye	Frequency	Percent
No DR	105	75.0
DR	35	25.0
Total	140	100.0

Table 8: Frequency of slit lamp in left eye.

Discussion

In diabetes disease, the human body does not produce enough insulin or cells of the body do not respond to the insulin that is produced.

In 2010, globally estimated 285 million population had diabetes with type 2 making up about 90% of the cases. But in 2013, according to new data record of International Diabetes Federation estimated approximately 381 million people had diabetes. This ration or numbers are increasing day by day, on 2030, estimated too almost double. Diabetes mellitus disease are common (especially type 2) in the more developed countries.

All diabetic patients are on risk of retinopathy and cause blindness of the eye. The laser treatment for diabetic retinopathy is used called photocoagulation. This should make the new blood vessels shrink and disappear. PRP has been used for many years and is the most effective treatment for this problem.

Current study (recently) was based on the comparison between two machines (non-mydriatic fundus camera and slit lamp biomicroscope) in diabetic patients. in this research the patients who is having diabetes are total number of 140, in which males are 77 while 63 are females. The result shows that the total number of eyes were 280 in which 215 eyes have no DR and 65 eyes having DR detected by non-mydriatic fundus camera, therefore slit lamp detected the 207 eyes have no DR while 73 have DR.

This descriptive study was proved that slit lamp biomicroscope is a standard test to detect the diabetic retinopathy as compare to non-mydriatic fundus camera because in non-mydriatic fundus camera there is no need to dilate the patients that's why machine missed the signs of DR in few cases. However, in slit lamp biomicroscope ophthalmologist examine the patient with dilated pupil as well as with the help of 90D lenses, that's why there is no chance to miss any sign of DR in slit lamp.

Conclusion

Concluded that slit lamp biomicroscope is a standard test to detect the Diabetic Retinopathy.

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