

Frequency of Eye Complications among Long Standing Diabetes Sufferers

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ABSTRACT

Aim: To assess the ophthalmological complications in subjects suffering from diabetes mellitus and these are retinopathy, cataracts and glaucoma.

Place of study: Layton Rahmatulla Benevolent Trust (LRBT) Eye Hospital, Karachi region.

Period of study: From December 2012 to February 2013.

Study Design: Cross sectional study.

Methods: Assessment was done by slit lamp biomicroscope, fundoscopy and ophthalmoscopy. Female patients having BMI between 25 and 29 were found to have greater complications. 30% of obese females suffered from non-insulin dependent diabetes that is relatively greater than males of non-insulin dependent diabetes in same age group. Most of the patients suffering from insulin dependent diabetes were under the BMI of 25; males 56.16% and females 58.1%.

Results: Incidence of complications was lower where the length of disease was less than one year. As the disease lasted for 10 to 20 years, the frequency of complications as observed in males were; retinopathy 43.83%, cataract 35%, glaucoma 66.66%. Whereas the female patients with the duration of disease 10-20 years showed overall 47.5% of complications as compared to male sufferers. Whereas, individuals having concomitant hypertension showed that male diabetic subjects had 28% retinopathy, 9.75% cataracts and 7.31% glaucoma. While the females showed retinopathy 47.61%, cataracts 11.9%, retinopathy 60.46%, 27.95% cataract and glaucoma 11.62%. The incidence of retinopathy was higher and was strongly associated with duration of the disease.

Keywords: Diabetes Mellitus, Retinopathy, Cataract, Glaucoma, Biomicroscope

INTRODUCTION

Diabetes mellitus is a metabolic syndrome clinically presented as hyperglycemia i.e., elevated serum levels of glucose which is outcome of failure of insulin in its secretion / action or both. Insulin is a hormone secreted by beta type of cells located in pancreas. It is required to utilize glucose from food after it is digested and used as the source of energy. Long standing hyperglycemia is associated with micro and macro vascular complications leading to visual impairment, blindness, renal disease, neuropathy, stroke and cardiovascular complications.

History of this disease is 3000 years old whereas, the term "diabetes" was given by a physician Aretus of Cappodocia, resident of Greece. Afterwards, 'Mellitus (sweet)' added by Thomas Willis in 1675, a British doctor after observing urine sweetness. Nowadays, the disease is correlated with medicinal experiences. An important step in pathogenesis of diabetes is the role of the liver during glycogenesis. The role of the pancreas in causing diabetes was unveiled in Austria in 1889. Tolbutamide was marketed as first orally administrated hypoglycemic agent in 1955¹¹.

The word "diabetes" that dirt started early and was taken from the Greek "quasi-pipe" is larger than the

system but must pass. "Diabetes" in English is honey "and" sweet disease "to distinguish truffles" "Pseudo diabetes is a state in which urine does not show large amounts of sugar. 70 million people suffer from diabetes worldwide. Here^{8,1}. 2% of the population is affected 8 to 10% of Pakistan in the UK population suffering from diabetes. It can affect physical ability to use insulin for health form factors such as overeating, exercise and obesity, lack of insulin resistance called life. Rising genetics, history and other factors, whichever is smaller with the family. This disease is classified in two types:

Insulin dependent diabetes mellitus: Also named as type-1 diabetes mellitus where the immune system destroys β -cells thus insulin from the pancreas. It is related to unusual immune responses e.g. a partial etiology in normal children's disorders such as mumps and other autoimmune disorders¹.

Non-insulin dependent diabetes mellitus: Also named as type-2 diabetes mellitus where metabolic disorders such as obesity and insulin resistance. However, in these patients the insulin delivered to body is insufficient as the pancreas does not produce enough insulin to control glucose turn outs. Therefore, type 2 diabetes is the most common type accounting for 85% to 95% of cases in developed as well as in developing countries⁹.

Prevalence of Eye Problem in Diabetic people: Diabetes mellitus relates to eyelids, conjunctiva, cornea, lens, eye muscles, retina, optic nerve and iris. Diabetic retinopathy is carried by changes in the micro vessels of the retina. Hardening of the basement membrane alters the loss of the tissue of the blood retinal barrier, but enriches the permeability of the retinal capillary and leads to the inability of the vessel wall associated with hyperglycemia.

Cataract: At higher serum glucose levels in diabetic patients, the lens shows elevated levels of enzyme aldose

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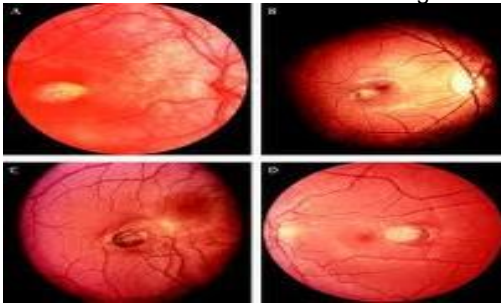
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reductase which is abundantly converted to sorbitol in epithelial cells of the lens. Sorbitol is generally circulated in the cell and its accumulation causes, swelling, opacification and imbalance of the electrolytes in lens³.



Retinopathy: Elevated serum sugar level damages the small retinal blood vessels as well as the lining at its back⁴.



Glaucoma: A progressive ophthalmological neuropathy along with raised intraocular pressure (IOP)⁵.



MATERIAL AND METHODS

This study was conducted in the Layton Rahmatulla Benevolent Trust (LRBT) Eye Hospital in Karachi region. Study was based on the prevalence of ocular complications in patients suffering from diabetes mellitus. 106 men and 85 women were tested; both historical precursors of diabetes mellitus and ocular alterations of diabetes mellitus. All patients were analyzed at the time. The mean age of the patients in this study was 53 years in males, while in females it was 55 years. A consent form was prepared and duly filled to get consent of the subjects. They were enquired about socioeconomic status, appetite, addiction, complete personal and family history of diabetes, normal and complicated elements of risks of ocular complications questionnaire.

RESULTS

It was observed that 200 patients (106 men and 94 females) had diabetes. There were four basic eye problems that encountered these problems. Of the total of 106 people, 68.86% of diabetic retinopathy was 6.6% refractive error observed in 20% cataract, glaucoma, 5.66% in men. 44% of retinopathy in female subjects, 15% cataract and 35% refractive errors. One female patient was without glaucoma. Subjects showed low frequencies of complexity were found in the 20th to 39th year. The threat of diabetic ocular disease was great for diabetic patients in the long term diabetes.

Table 1: Division of patients based on BMI

| BMI (Kg/m ²) | Insulin dependent Diabetes | | Non-Insulin dependent Diabetes | |
|--------------------------|----------------------------|---------------|--------------------------------|---------------|
| | Male (n=33) | Female (n=20) | Male (n=73) | Female (n=74) |
| Normal <25 | 16 (48.48%) | 4 (20%) | 41 (56.16%) | 43 (58.10%) |
| Overweight 25-29.9 | 12 (36.36%) | 10 (50%) | 19 (26.02%) | 14 (18.91%) |
| Obese ≥30 | 5 (15.15%) | 6 (30%) | 13 (17.80%) | 17 (22.99%) |

*BMI= Body Mass Index (Kg/m²= Kilogram per meter square)

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Table 2: Frequency of complications in eye related with duration of disease in males:

| Duration of Diabetes Mellitus (years) | Retinopathy (n=73) | Cataract (n=20) | Glaucoma (n=6) | Refractive error (n=80) | Hemorrhage (n=6) |
|---------------------------------------|--------------------|-----------------|----------------|-------------------------|------------------|
| >1 | 2 (2.73%) | 0 | 0 | 3 (3.75%) | 0 |
| 1-10. | 26 (35.61%) | 13 (65%) | 2 (33.33%) | 44 (55%) | 4 (66.66%) |
| 10-20. | 32 (43.83%) | 7 (35%) | 4 (66.66%) | 30 (37.5%) | 2 (33.33%) |
| 20-30. | 8 (10.95%) | 0 | 0 | 3 (3.75%) | 0 |
| 40-50. | 5 (6.84%) | 0 | 0 | 0 | 0 |

Table 3: Frequency of eye complication related to duration of the diabetes in females

| Duration Of Diabetes Mellitus (yrs) | Retinopathy (n=40) | Cataract (n=15) | Glaucoma (n=0) | Refractive error(n=65) | Hemorrhage (n=2) |
|-------------------------------------|--------------------|-----------------|----------------|------------------------|------------------|
| >1 | 0 | 0 | 0 | 0 | 0 |
| 1-10. | 11 (27.5%) | 9 (60%) | 0 | 0 | 1 (50%) |
| 10-20. | 19 (47.5%) | 6 (40%) | 0 | 35 (53.84%) | 1 (50%) |
| 20-30. | 8 (20%) | 0 | 0 | 30 (46.15%) | 0 |
| 40-50. | 2 (5%) | 0 | 0 | 0 | 0 |

Fig. 1

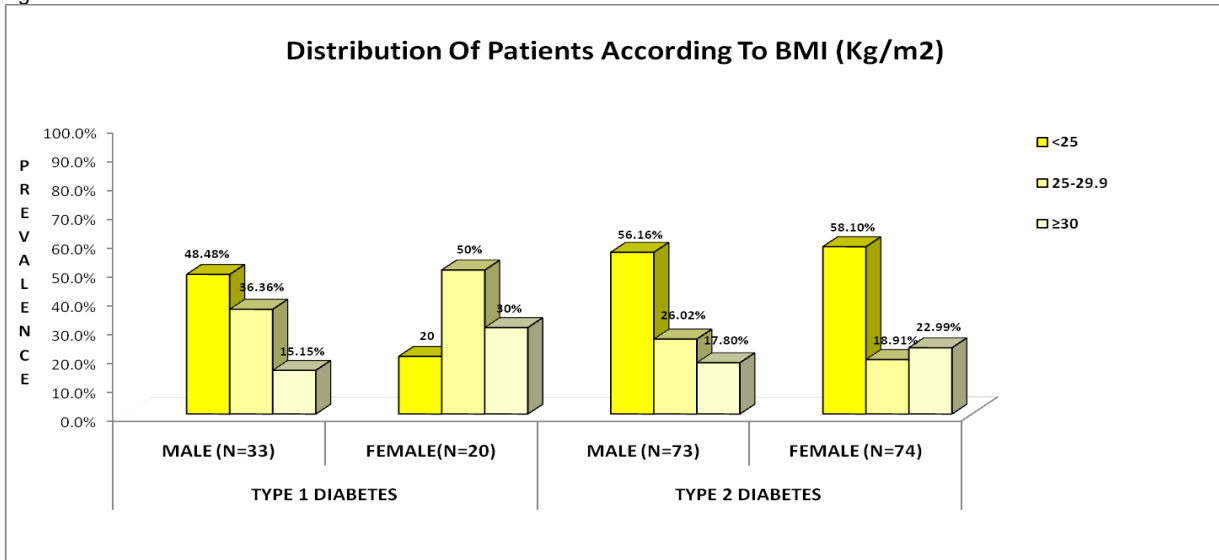


Fig. 2

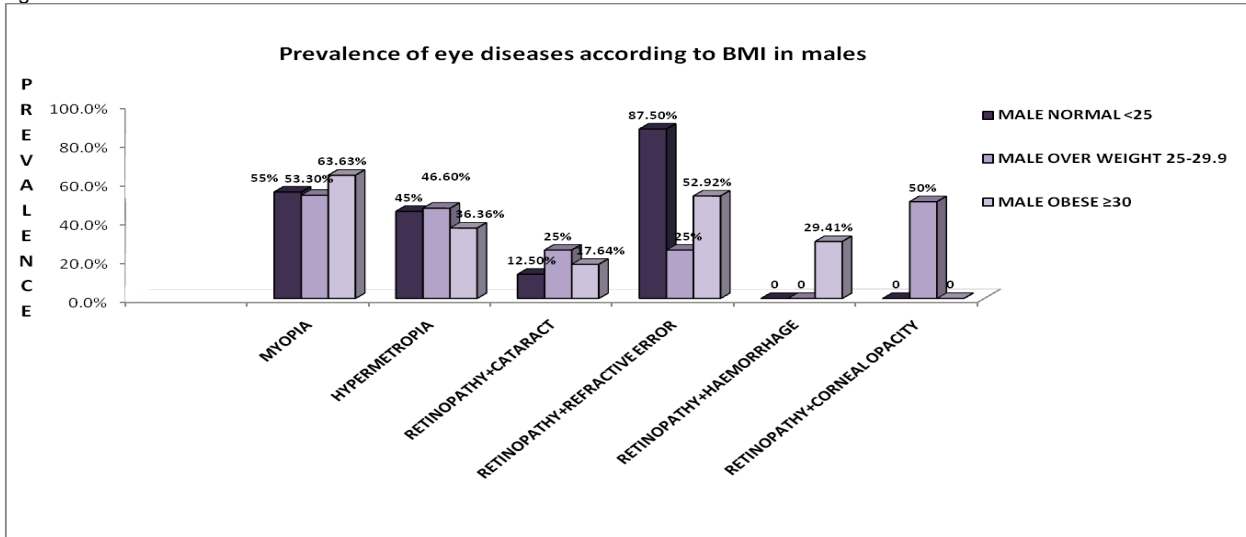


Fig. 3

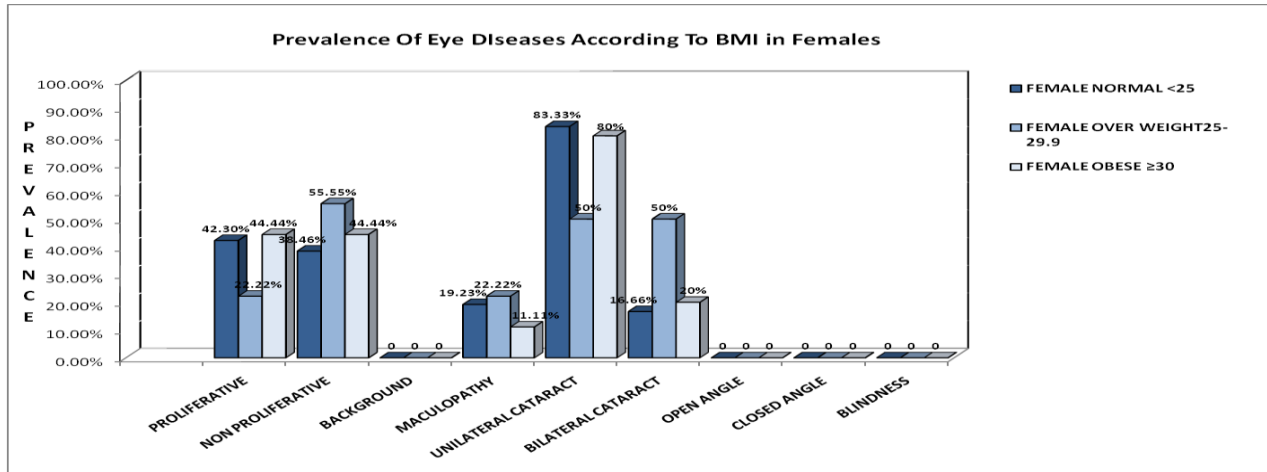


Fig. 4

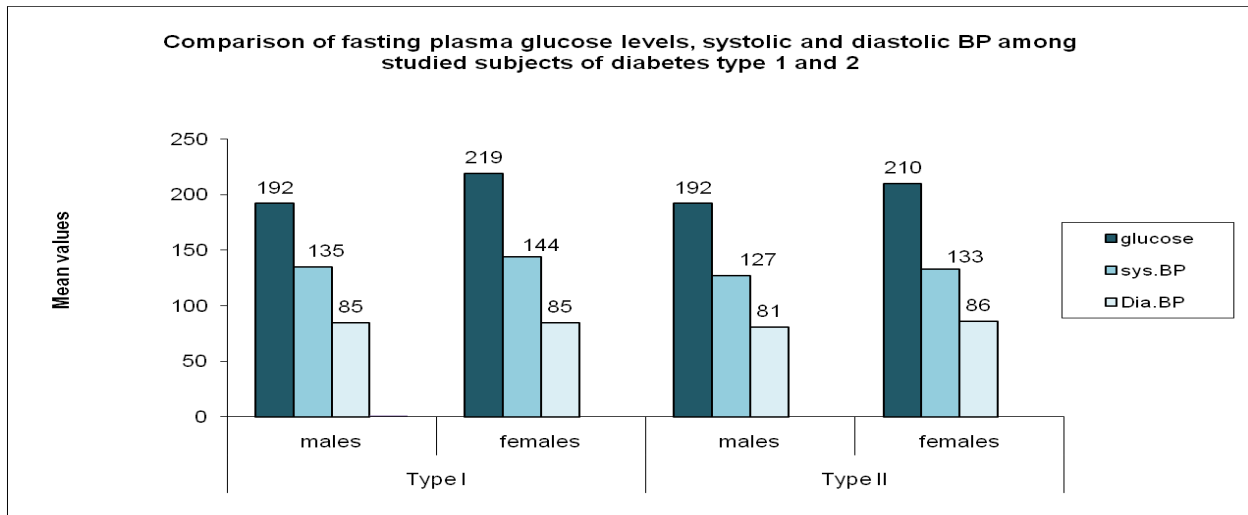
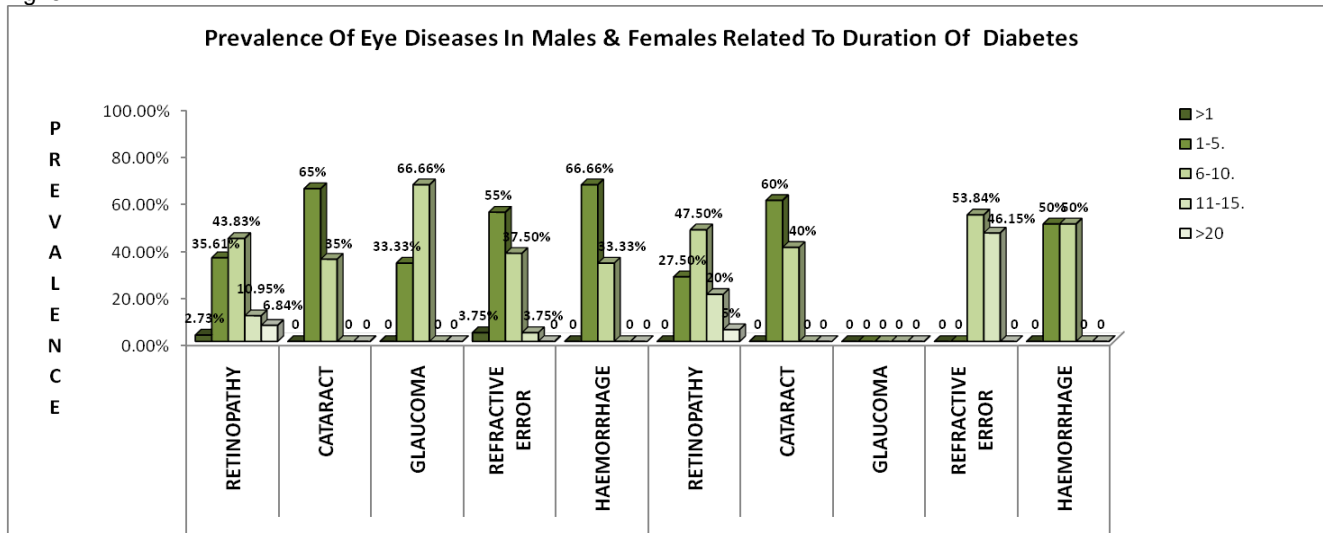


Fig. 5



DISCUSSION

Currently, as estimated by WHO, 190 million people suffer from diabetes worldwide population in 2025 may increase to 322 million people⁶. (WHO), an increase of diabetes case 5.2 million people in Pakistan according to are the latest report of the World Health Organization 13.3 million people, is often the fifth in the world in 2030. This trend has developed in the country grown. The past 40 years, the human environment, behavior is a fundamental change in lifestyle. In general, the proportion of type 2 diabetes mellitus was 90% or more. Type 1 diabetes; the majority of the population, mainly in Asia, the Middle East, Pacific Islander and African have relatively rare disease. Although increases in prevalence, age of onset of type 2 diabetes and complications that parallel with the high prevalence of diabetes, diabetes, such as diabetic complications, in particular diabetic retinopathy also fears that there is a higher probability. This study was designed for 200 patients with diabetes (106 males, 94 females). This study shows that the diabetes is increased in males comparatively. In the present study diabetic retinopathy in a rate of 68.86 male patients from 94 patients as counselors (Table III) and 42.55% (Table IV) were considered. If the patient is diabetic, BMI will be able to complicate diabetic retinopathy, increase or decrease in the type of lifestyle and diabetes dependent¹⁰.

CONCLUSION

The promoter of our research information is of the view that eye complications reveal early screening measures for prevention and treatment of diabetes on priority basis. Retinopathy and associated complications in such cases produces an urge to generate trained personnel at all levels to provide quality diabetic care services at their doorsteps.

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