INTRODUCTION

The eye is the most beautiful gift to human beings. From times immemorial poets and nature lovers have been unanimous in their aloquent praise for this gift comparing it with the eyes of deers, a lotus and the lake. But the beauty of this marvellous gift of nature is often called to danger by a crafty disease known as "Glaucoma". Glaucoma in which the rate of visual loss is sky high and it therefore deserves serious and steady exploration till necessary causes etc. are known.

Diabetes Mellitus is the most common of the serious metabolic disease of humans. It is a chronic illness which involves almost every system of the body. Diabetes mellitus with in the last four decades has emerged as a major cause of blindness and visual disability not only in developed countries but also in developing countries.

It affects almost every part of the eye.

The common complications are -
(a) Increased incidence of Infections e.g. - Blepharitis, Conjunctivitis, Corneal ulcer, Scleritis, uveitis and optic neuritis
(b) Diabetic Cataract
(c) Diabetic Retinopathy
(d) Glaucoma

All these Complications may lead to Blindness.

Diabetes is devided into 2 major groups
(a) Insulin dependent (*Type I*)
(b) Non Insulin dependent (*Type II*)

Insulin dependent diabetes is due to damage of the Beta Cells of Pancreatic islets of langerhans. It is not directly inherited although individual may inherit a predisposition associated with certain H LA types. The peak incidence is 10-20 years although elderly patients can also be insulin dependent.
Non insulin dependent diabetes has no known cause although in many cases there is a strong genetic component unrelated to the HLA system. It is most prevalent between the ages of 50 and 70 years. There may be a certain amount of overlap between the two types of diabetes.

As far as the prevalence of diabetes mellitus is concerned in India it varies from 0.70-4.0% in various age group of patients. The prevalence of blindness in patients with diabetes mellitus varies from 6-10% (U/L or B/L). The risk of blindness is about 25 times greater in diabetics than in non diabetics.

The leading cause of blindness in diabetic person is diabetic retinopathy which varies from 4-20% of total diabetic blindness. The frequency of retinopathy appears to vary with age of onset as well as with the duration of disease.

Diabetic retinopathy can be broadly divided into two forms. In the majority of cases the lesion consists of microaneurysms, hemorrhages, exudates and retinal oedema. This may be termed as SIMPLE OR BACK GROUND DIABETIC RETINOPATHY.

Superimposed on this form is another more virulent type PROLIFERATIVE DIABETIC RETINOPATHY characterized by formation of new vessels in the retina and proliferating into the vitreous.

Diabetes besides it’s other ocular manifestations also affects the intraocular pressure.

By the definition glaucoma is a condition in which the intraocular pressure is sufficiently (usually greater than 22mmHg) raised to cause damage to optic nerve (cupping) and there by changes in the visual field. Central vision often remains normal until late in the disease.

There are three main types of glaucoma in relation to diabetes as well as general population

(a) Chronic open angle
(b) Narrow angle
(c) Secondary - Here in which we are only concern with neovascular glaucoma.
CHRONIC OPEN ANGLE

It is a type of primary glaucoma where there is no obvious cause for the rise of intraocular tension and the angle of anterior chamber remains wide. The defect is thought to be in the microscopic outflow channels located within this angle.

NARROW ANGLE GLAUCOMA

It is rare but clinically impressive type which some times include a hereditary component. In this glaucoma the normal angle outflow channels are closed because of apposition of iris to the posterior corneal surface. Intraocular pressure rises rapidly to high levels with resultant pain, decreased vision, halos around light and often nausea and vomiting.

NEOVASCULAR GLAUCOMA

It is due to formation of new blood vessels on the surface of iris and in the angle of anterior chamber (Rubeosis iridis). This is usually seen with significant proliferative retinopathy. Diabetes is probably the commonest cause of Neovascular glaucoma, and CRVO is the second one. This condition is directly related to the duration of diabetes, 76% Rubeosis Iridis occurs in patients with duration of 15 years or more.

Glaucoma is one of the leading causes of blindness. According to Graham & Hallow (1966) Chronic simple glaucoma is 4-5 times more common than primary angle closure glaucoma.

According to Bankes et al (1968) overall prevalence of glaucoma is about 1% of general population over the age of 40 years.

The blindness due to glaucoma varies from 0.5% -1% in India (Park & Park).

An association between diabetes mellitus and glaucoma is generally accepted together with the notion that co-existence of diabetes and ocular hypertension delineates an individual at particular risk of developing visual field loss.

Many studies have investigated the possible existence of an association between...
Studies have shown a higher prevalence of elevated mean intraocular pressure as well as open angle glaucoma among persons with diabetes compared with non diabetes. ((Becker B 1971), Klein Bek et al, Klein BEK, Moss SC (1984))

A higher prevalence of individuals with abnormal glucose metabolism among glaucoma patients than among general population Armstrong et al (1960).

Intraocular pressures of both type I and type II diabetic patients appear to be higher than in the non diabetic population (Traismen et al 1980)

Although there is some disagreement among series chronic open angle glaucoma appears to be more prevalent among patients with diabetes (Armley et al 1967, Becker 1971) Frequency of glaucoma is 5% in the diabetic population as compared to 2% in the population at large. (Joslin's The eyes and diabetes)

Diabetes mellitus occurs more frequently in patients with primary open angle glaucoma than in general population. (Becker shaffer “Diagnosis and therapy of glaucoma 1983).

The Baltimore eye survey found little evidence of an association between glaucoma and either insulin dependent or non insulin dependent diabetes (Ophthalmology 1995:102:40-53)

Both diabetes mellitus and glaucoma occur in the same age group and both the diseases together probably will increase the blinding effect of the eye. So early detection of both the diseases becomes necessary.

Before detection and treatment it is necessary to know the incidence of both the diseases occurring simultaneously.

Whatever studies are available in literature are usually from developed countries. Therefore the magnitude of this problem in India needs to be investigated.

The present study is undertaken to evaluate the intraocular pressure in normal
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The present study is undertaken to evaluate the intraocular pressure in normal and diabetic patients and to assess the relation between glaucoma and diabetic Retinopathy.