I- INTRODUCTION

Glaucoma is typically described as a progressive neuropathy characterized by loss of retinal ganglion cells (RGCs) with pathological changes in the optic nerve head. Primary open angle glaucoma (POAG) is the most common type of glaucoma in many countries. It is an insidious, slowly progressive bilateral condition. Clinically ,there is evedince of optic disc or retinal nerve fiber layer (RNFL) structural abnormalities with reproducible functional glaucomatous visual field defects , open angles and absence of other secondry causes **(American Academy of Ophthalmology ,2005)**

A number of techniques hase been developed to diagnose and monitor POAG. The search for ways of making an earlier diagnosis and hence improving the prognosis of the disease continues with varying degrees of success **(Kerrigan et al 2000)**.

Visual field testing remains the main stay as a subjective test currently available for diagnosis and following patients with glaucoma. Automated perimetry has allowed the development of standardized tests for obtaining quantitive measurements of visual field testing in glaucoma **(Cholpin & Edwards, 1995)**.

The use of automated static perimetry provides a map of visual field by projecting stimuli of variable light intensities, sizes and colours into a bowl shaped screen. **(Budenz, 1997**).

Reliance on IOP, optic disc cupping changes, nerve fibre layer integrity and visual field changes may delay the treatment of glaucoma

since irreversible changes may have already occurred at the time of diagnosis **(Shorstein et al., 1999).**

Optical coherence tomrography (OCT) is a new optical technique for high resolution measurements and cross sectional imaging of the retina and nerve fiber layer (NFL) in particular **(Hee et al., 1995).** OCT allows direct measurement of NFL thickness by in vivo visualization of cross sectional images of the retina and NFL at histologic levels of resolution approximately 10um .Recently, STRATUS OCT can provide a great sampling density that has increased the axial resolution from 10-17 microns in (OCT1) to 7-8 microns in (OCT3) **(Schuman et al., 1996).**

Because glaucomatous damage can be controlled with medication and surgery, it is important to detect early signs of inner retinal damage. Significant ganglion cell fibre loss can occur before there is a reliable change in the visual field. For this reason considerable attention has been paid to other measures. The multifocal electroretinogram (mfERG) can examine the retina to give a clear indication of central and peripheral electrical responses **(Sutter, 1992).** Recent studies have provided strong evidence that mfERG responses also contain significant contributions generated by inner retinal mechanisms, including ganglion cell action potentials **(Hood et al., 1999,Bearse et al., 2000 ,Frishman et al., 2000 and Hare et al., 2001)**

Response components organizing with inner retinal activity may reflect both local events and events arising more proximally, such as the optic nerve head component (ONHC), first proposed by **Sutter and Bearse, 1999.** Identification of mfERG components that may depend on normal electrophysiologic function of ganglion cells have given rise to

interest in the mfERG as a potential tool for the study of glaucoma. **(Bearse et al 1995,Bearse et al 1996,Sutter et al., 1999 , Fortune et al 2000,Hasegawa, et al., 2000 ,Klistorner et al., 2000 ,Palmowski et al., 2000 ,Bearse et al., 2001&Fourtune et al., 2001,Fortune et al 2002).**