

Normal IOP Curve in a Healthy Sample of Cairo Population

Thesis

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To the Soul of My Father

Also I would like to thank my mother who stood by me through out my life, encouraged me and prayed for me.

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List of Abbreviations

(ISGEO)	International Society For Geographic And Epidemiological Ophthalmology
(IOP)	Intraocular Pressure
(POAG)	Primary Open-Angle glaucoma

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Introduction & Aim of Work

Introduction:

Whether manifesting as POAG, primary angle-closure, or congenital disease, glaucoma is among the leading causes of blindness in the developing world and a major health problem in the developed world^(1,2) With the basic medical resources available in the developed world, nearly all cases of blindness from glaucoma are preventable if the disease is detected early and proper treatment is implemented⁽³⁾.

Glaucoma used to be defined as a group of diseases in which the intraocular pressure (IOP) is sufficiently elevated to damage vision. Two decades ago, it was defined as a disturbance of the structural or functional integrity of the eye which can be arrested or diminished by adequate lowering of IOP⁽⁴⁾. Nowadays, glaucoma is defined as a progressive optic neuropathy with characteristic structural and functional damage⁽⁵⁾. So, IOP has disappeared from the definition of glaucoma but elevated IOP is considered a major risk factor⁽⁶⁾. It can still be used in diagnosis when the optic disc cannot be seen and perimetry is impossible and as a detector of glaucoma suspects according to the **International Society for Geographic and Epidemiological Ophthalmology (ISGEO)**⁽⁷⁾.

Lowering intraocular pressure is still the only practical form of medical treatment in glaucoma and in neuroprotection.

To diagnose, follow glaucoma and maintain optic nerve function, intraocular pressure measurement is an important tool.

To understand the magnitude of glaucoma problem in a society we must first collect appropriate data about intraocular pressure levels and ranges in that society.

Information about IOP is lacking in our country. We have a little data about normal IOP range, mean, curves, diurnal variations...etc. Such information is vital for proper management of glaucoma cases, Racial and environmental difference speaks against blind use of western curves and means.

The aim of this study is to collect data about the IOP in different age groups and to build up a curve for normative IOP data in a sample of Egyptian population located in Cairo.

Definitions

Definitions:

The concepts and definitions of glaucoma have evolved in the past 100 years ⁽⁸⁾, but still they remain imprecise and subject to technical qualifications. The word glaucoma originally meant "clouded" in Greek; as such, it may have referred both to a mature cataract and to corneal edema that might result from highly elevated pressure. Today the term does not refer to a single disease entity, but rather to a group of diseases that differ in their clinical presentation, pathophysiology, and treatment. These diseases are grouped together because they share certain features, including cupping and atrophy of the optic nerve head, which leads to visual field loss and is frequently related to the level of intraocular pressure (IOP).

Glaucoma is defined as a disturbance of the structural or functional integrity of the optic nerve that can usually be arrested or diminished by adequate lowering of IOP. An important distinction must be noted in the criteria currently used to define primary open-angle glaucoma (POAG), in contrast to all other forms of glaucoma. POAG is considered as a "multifactorial optic neuropathy [with] a characteristic acquired loss of optic nerve fibers⁽⁹⁾, developing in the presence of open anterior chamber angles and manifesting characteristic visual field abnormalities, in the absence of other known causes of the disease. In contrast, all other types of glaucoma—from primary angle-closure⁽¹⁰⁾ to the secondary glaucomas—are defined first and foremost by the presence of elevated IOP, and not in reference to the optic neuropathy that follows sustained elevated IOPs.

IOP is determined by the balance between the rate of aqueous humor production of the ciliary body, the resistance to aqueous outflow at the angle of the anterior chamber, and the level of episcleral venous pressure. In most cases elevated IOP is caused by increased resistance to aqueous humor outflow. The optic nerve and visual field changes of glaucoma are determined by the resistance to damage of the optic nerve axons.

In most cases of glaucoma, progressive changes in the visual field and optic nerve are related to increased IOP; in some instances even "normal" levels of IOP are too high for proper functioning of the optic nerve axons. Although there may be absolutely no "safe" pressure that guarantees the absence of POAG,⁽¹¹⁾ lowering IOP to the low normal range usually arrests or slows the progress of glaucoma.⁽¹²⁾ If this is not true, it can be postulated that (1) the IOP is not low enough to stabilize the disease; (2) the optic nerve is so damaged that even the normal age-related loss of axons produces further visual deterioration; or (3) there is a non-pressure-dependent element to the visual loss. If the third situation exists, it is not currently distinguishable from glaucoma.

Epidemiology