

OCCURRENCE OF NORMAL TENSION GLAUCOMA IN PESHAWAR AND CONTIGUOUS AREAS

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ABSTRACT

Objective: To investigate the prevalence of normal tension glaucoma (NTG) in Peshawar and its neighboring areas, and to attempt to create understanding among the common people in general and the eyecare personnel in particular about the disease.

Material and Methods: The study was accomplished at the Department of Physiology, Khyber Medical College, (KMC), Peshawar, in association with the Department of Ophthalmology, Khyber Teaching Hospital (KTH), Peshawar, for a period of six months. Patients of both sexes (age 35-65), who attended the outpatients department with normal IOP, open drainage angle, cupped discs and/or loss of neural rim, visual field defects consistent with glaucomatous damage and apparently no other secondary cause for glaucomatous neuropathy, were included in the study. Modern sophisticated tools and techniques were used to diagnose normal tension glaucoma (NTG).

Results: A total of 394 patients were screened during a period of six months whereby 100 patients (mean age 51.21 ± 8.12 years) fulfilled the inclusion criteria. It was a set strategy that the study would come to its end when a count of 100 patients would reach at. The male patients were 33(8.4%) and the female patients were 67(17%) of the total patients screened for the purpose. The IOP in both eyes of female patients was higher than those of male patients and in both cases the difference (by comparing the corresponding IOP of females with males) was statistically significant ($P < 0.05$).

Conclusion: We conclude that 25.4% of the subjects (age 35-65, mean age 51.21 ± 8.12 years) of the study were suffering from NTG among whom 8.4% were males and 17% were females.

Key Words: Normal Tension Glaucoma (NTG) in Peshawar and contiguous areas.

INTRODUCTION

Glaucoma was the second leading cause of vision loss in the world in 1996¹ and it was also, second only to cataract, as a leading cause of global blindness in 2002². Glaucoma was also the second leading cause of blindness worldwide, disproportionately affecting women and Asians in 2006³. The definition of glaucoma has been debated since the Hippocratic era some 2,500 years ago, and it is a debate that has not yet reached a conclusion⁴. Glaucoma is a term describing a group of ocular disorders with multi-factorial etiology united by a clinically characteristic intraocular pressure-associated optic neuropathy⁵. Glaucoma is a disease where the optic nerve dies. We are not sure why or how this happens (there are many mechanical, vascular, and biochemical theories) but high intraocular pressure certainly seems to be associated, if not entirely the cause of optic nerve death⁶. According to the level of intraocular pressure (IOP), open angle glaucoma is

divided into high tension glaucoma (HTG) and normal tension glaucoma (NTG)⁷. Normal-tension glaucoma (also called low-tension glaucoma) is a unique condition in which optic nerve damage and vision loss have occurred despite a normal pressure inside the eye⁸. On account of its normal IOP, the authors of the study, about normal tension glaucoma, were of the view that this detrimental eye ailment can be easily skipped by clinicians and eyecare professionals, considering it a normal condition, during routine clinical examination. Therefore, the main purpose of the study was to explore the prevalence of the disease in Peshawar region with its surrounding areas and to attempt to have the eyecare personnel and the general public aware of this silent blinding condition. The data was analyzed on SPSS version 10.

MATERIAL AND METHODS

The study was conducted at the Department of Physiology, Khyber Medical College (KMC), Peshawar, with the collaboration of the Department of Ophthalmology, Khyber Teaching Hospital (KTH), Peshawar, for a period of six months. Patients of both sexes with 35-65 years of age, normal IOP, open drainage angle, cupped discs and/or loss of neural rim, visual field defects consistent with glaucomatous damage and apparently no other secondary cause for glaucomatous

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neuropathy, who attended the outpatients department (OPD), were included in the study. Patients who did not met the above criteria and with optic neuropathy caused by diabetes mellitus or tumors, any sort of traumatic disease of the eyes, medically or surgically treated eyes, cataract and generalized gross medical problems were not enlisted for the assignment. Each patient was briefed about the procedure and each patient, then, underwent thorough general physical examination, visual acuity determination and eye field detection by perimetry (Humphrey 720i, Visual Field Analyzer) to determine visual field defects, followed by instillation of proparacaine (Alcaine Eye Drops 0.5%) and tropicamide (Mydracil Eye Drops 1%) into the eyes of each patient (as recommended) to anesthetize the eyes and to dilate the pupils for smooth examination. Then each patients was passed through, slit lamp (model TOPCON SL-3C) examination to generally assess the anterior segment, funduscopy (with ophthalmoscope model Keeler Vista 20) to judge the fundus and optic disc cupping of the eyes, tonometry (with tonometer model Haag-Streit AT 900) to find out IOP and gonioscopy (with gonioscope model Haag-Streit EG Berne) to know the angle of the eyes.

RESULTS

A total of 394 patients were screened during a period of six months whereby 100 patients (mean age 51.21 ± 8.12 years) fulfilled the inclusion criteria. The selected NTG patients comprised 25.4% of the total screened patients (in an earlier study⁹ of our country, the overall frequency of NTG was 22% among suspected cases of primary open angle glaucoma ie POAG). The male patients were 33(8.4%) and the female patients were 67(17%) of the total patients investigated for the purpose. It was a pre-planned strategy that the study would come to its end when a count of 100 patients would get replenished. Table 1 shows that the IOP in both eyes of female patients was higher than those of male patients and in both cases the difference (by comparing the corresponding IOP of females with males) was statistically significant ($P < 0.05$).

The study showed that there were 28% male and 65% female patients with mild to moderate disc cupping and only 5% males and 2% females were suffering from gross disc cupping of their right eyes. Similarly, there were 32% male and 66% female patients with mild to moderate disc cupping and only 1% males and 1%

Table 1: Comparison of intraocular pressure (IOP) of male and female patients suffering from normal tension glaucoma

IOP (mm Hg) of Eyes	Males 33%	Females 67%	P Value
Mean IOP of right eyes	16.55 ± 2.06	17.45 ± 1.55	$P < 0.016$
Mean IOP of left eyes	16.27 ± 2.23	17.81 ± 1.57	$P < 0.001$

Eye Discs Cupping of Patients with NTG

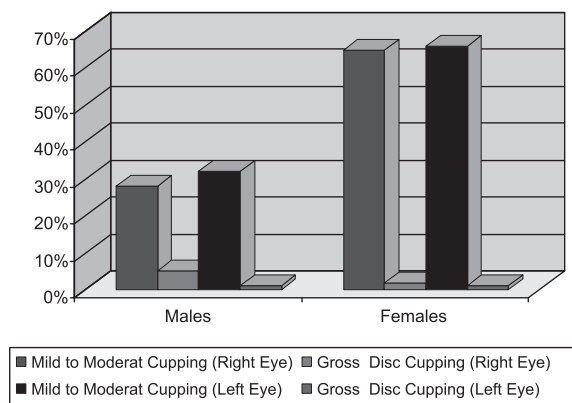


Figure 1: Graphic representation of percentage of patients with normal tension glaucoma (NTG)

females were suffering from gross disc cupping of their left eyes. This fact is visualized in Figure 1. The figure highlights that the number of female patients suffering from mild to moderate disc cupping was slightly more than double the number of male patients. It also shows that the number of patients with gross disc cupping is not very common.

DISCUSSION

Glaucoma is a major eye problem afflicting millions of people worldwide¹⁰. Open angle glaucoma is a disease of elderly population and the risk factors for this disease can be age and sex but NTG is more frequently present than HTG among elderly population and females⁷. We found nearly similar results in our study and found that the number of female patients suffering from mild to moderate disc cupping was even more than double the number of male patients. This authenticates that females at par with males are more vulnerable to develop cupped discs. We also observed that the patients with gross disc cupping are not as common as the patients suffering from mild to moderate disc cupping but in this case the males were double that of females. Here we could also say, on the same analogy as we said for mild to moderate disc cupping patients that the males at par with females are more susceptible to develop gross disc cupping, but to be on the safe side, we abstain ourselves from this notion because the number of patients, in our study, was very small and this could verily be by chance. Nevertheless, we did find neither an exact reason nor a logically fit explanation for the findings. However, we suggest that this observation must not be overlooked during routine clinical eye examination when labeling a person to be suffering from NTG or otherwise. There is no exact consensus on the normal range of IOP; some considers that it ranges from 10 mm to 21 mmHg¹¹ while other believes that it extends from 12 mm to 22 mmHg¹². All of our study patients who suffered from cupped disc fall within this limit (Table 1); therefore, we labeled all of our study subjects as patients of NTG. One of the

big questions about NTG one can ask may be why its sufferers develop optic disc damage despite normal IOP, as shown in our study. Because, it is on record that there are persons with higher IOP (ocular hypertension) than normal have not suffered from optic disc damage, though they have greater chances to develop glaucoma¹³. A lot of explanations are available but one of the many possible answers may be what we think normal limits for some ones might not be normal for others. We found that the difference between the intraocular pressures of male and female patients was statistically significant (Table 1). Does this mean that far very less IOP in males than females is sufficient to cause discs cupping? The answer to the question may or may not be very simple but at least our study demonstrates the same. However, before adopting this statement, a very extensive study with large population is essential to make the statement more authentic.

CONCLUSION

We publicize that 25.4% of the study people (age 35-65, mean age 51.21 ± 8.12 years) were suffering from NTG among whom 8.4% were males and 17% were females. We recommend that each person after the age of 35 years must have his eyes checked for glaucoma, especially for NTG because of its normal IOP it can be easily skipped, at least once in a year. NTG is a diagnosis of exclusion¹⁴; therefore, we further recommend that the eyecare professionals must give painstaking attention to this unheralded blinding disease while dealing with, not only the elders but also the youngsters.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Mohammad S: Creation of idea.

Khan GJ: Collection of data.

Aurangzeb: Data analysis.

Salman H: Typing and editing.

Parveen N: Supervised the study.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.