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Epidemiologic Assessment of Glaucoma among Pakistani Workers in Al-Samawah, Iraq: Findings Based on ISGEO Standards

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Abstracted

Glaucoma remains a significant public health concern in Al-Muthann , with prevalence rates observed among men compared to women. This study aimed to Identify the early signs and risk factors associated with glaucoma, including elevated intraocular pressure, optic nerve changes, and visual field defects. Screen patients at risk for glaucoma during routine eye examinations, including those with a family history, advanced age, diabetes, and other relevant medical conditions. Data collected from clinic and healthcare along a free examination to conduct this study in Al-Muthanna. .The findings suggest a need for improved diagnostic methods, increased awareness, and targeted preventive measures to reduce the burden of glaucoma in Al-Muthanna, particularly among high-risk groups of men such as Pakistani worker

Keywords: Primary Open-angle, Intraocular Pressure Optic, Disc Cupping ISGEO Classification, Epidemiology Occupational Eye Health.

Introduction:

Glaucoma is a complex and multifactorial eye disease that affects millions of people worldwide. It is characterized by progressive optic nerve damage and visual field loss, which can ultimately lead to irreversible blindness if left untreated. Despite its prevalence, glaucoma remains a significant public health challenge due to its insidious onset, asymptomatic nature, and lack of effective treatments for advanced stages of the disease. Glaucoma is an acquired loss of retinal ganglion cells and axons within the optic nerve or optic neuropathy that results in a characteristic optic nerve head appearance and a corresponding progressive loss of vision. One characteristic that sets this particular pattern of peripheral vision loss apart from other forms of visual impairment. Unless early indicators of glaucoma are found during normal eye exams, patients with POAG are frequently asymptomatic until extensive optic nerve damage occurs.

Unless early indicators of glaucoma are found during normal eye exams, patients with POAG are frequently asymptomatic until extensive optic nerve damage occurs. Acute angle-closure glaucoma, on the other hand, can occur abruptly and cause a sharp deterioration in vision along with symptoms such corneal edema, headache, nausea, and vomiting. A prior eye injury or underlying medical disorders frequently cause secondary glaucoma, which raises intraocular pressure and leads to visual neuropathy. Congenital, pigmentary, neovascular, exfoliative, traumatic, and uveitic glaucoma are among the subtypes that fall under this group. Despite normal or ordinary IOP values, normal or low-tension glaucoma manifests as an optic neuropathy with glaucomatous vision loss. Most forms of glaucoma are often diagnosed in people 40 years of age and older, while congenital, infantile, and developmental glaucoma, as well as a juvenile variation of POAG, mostly afflict younger people. Although IOP and glaucoma are frequently linked, a clear causal link has not been proven. Researchers are looking into how environmental and genetic variables affect the development of glaucoma. Studies using monozygotic twin pairs, which show a higher concordance rate than dizygotic couples, provide evidence that environmental factors play a major role in the development of the condition.

Methods:

Study Design and Setting:

How We Conducted the Study

Who We Studied and Where

For this study, we make surveyed on sampled group in Al-Samawah, Iraq. All the data was collected on-site between 1 March (2025) and was completed this year (2025) .

Who Participated and What We Did

Any worker aged 18 or older who agreed to takes part and signed a consent form was eligible. A trained eye technician performed a ocular exam for each participant at their workplace. This exam included:

- A standard vision test using an eye chart.
- A test to measure the pressure inside the eye.
- a slit lamp examination
- An examination of the optic nerve
- Every finding was recorded on standard forms and stored in database.

Statistical Analysis:

The SPSS v28 were used to analyse the data. Demographic and ocular parameters were summarized using descriptive statistics (means +- SD). The results of different occupational groups were compared using inferential tests (t-tests, ANOVA, chi-square). Logistic regression revealed the predictors of the abnormal IOP and CDR and significant at a level of $p < 0.05$.

Ethical Considerations

The researchers gained the approval of the Institutional Review Board of saw university as well as adhered to the Declaration of Helsinki. Each participant had a referral of any eye condition that needed further attention.

Outcomes : Primary outcome: Glaucoma condition (present/absent). -Secondary outcomes: subtype of glaucoma (POAG vs. PACG). The prevalence estimates were done using the 95 percent Wilson confidence interval in the overall and stratified by age and sex. The correlations between risk factors and glaucoma outcomes were evaluated

Result

N=130; glaucoma cases=4 (3.08%).

Table 1. Sample characteristics of glaucoma status

VARIABLE/LEVEL	Overall (n=130)	Glaucoma	No glaucoma
AGE	39.6 ± 9.6	44.5 ± 4.7	39.4 ± 9.7
IOP_R	15.1 ± 3.1	17.9 ± 2.8	15.0 ± 3.1
IOP_L	15.0 ± 2.8	17.5 ± 1.7	14.9 ± 2.8
CDR_R	0.4 ± 0.1	0.5 ± 0.1	0.4 ± 0.1
CDR_L	0.3 ± 0.1	0.6 ± 0.1	0.3 ± 0.1
VA_DECIMAL	0.9 ± 0.2	0.6 ± 0.1	0.9 ± 0.2
SEX = FEMALE	12 (9.2%)	0	12
SEX = MALE	118 (90.8%)	4	114
SMOKING = 0	77 (59.2%)	3	74
SMOKING = 1	53 (40.8%)	1	52
DIABETES = 0	114 (87.7%)	3	111
DIABETES = 1	16 (12.3%)	1	15
HYPERTENSION = 0	104 (80.0%)	2	102
HYPERTENSION = 1	26 (20.0%)	2	24
STEROID_USE = 0	123 (94.6%)	4	119
STEROID_USE = 1	7 (5.4%)	0	7
FAMILY_HISTORY = 0	122 (93.8%)	3	119
FAMILY_HISTORY = 1	8 (6.2%)	1	7
GONIO_NARROW = 0	117 (90.0%)	3	114
GONIO_NARROW = 1	13 (10.0%)	1	12

Table 2. Prevalence by sex

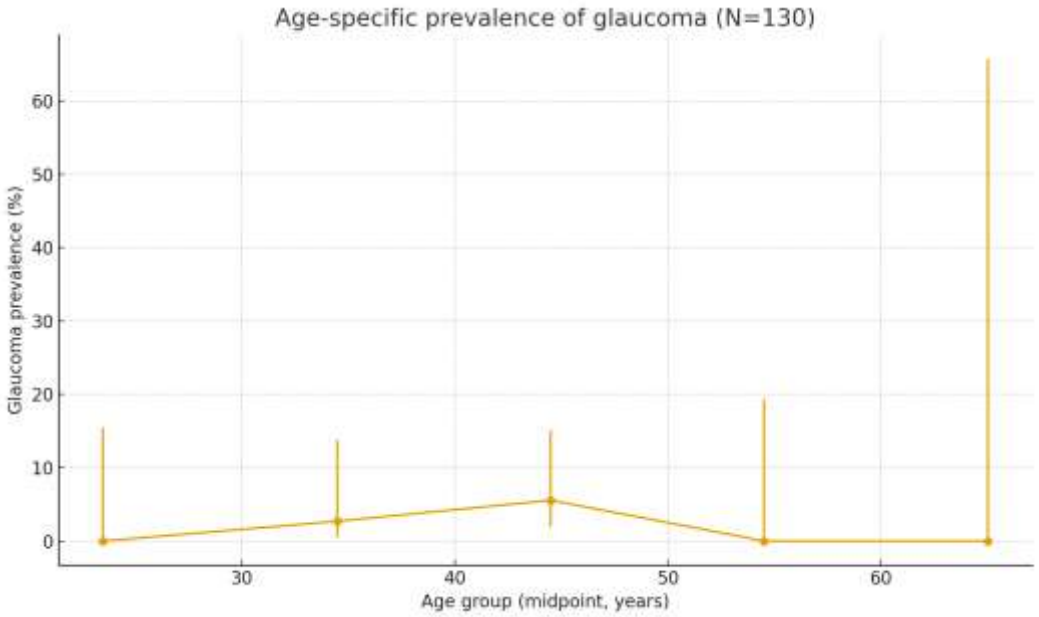
sex	cases	n	prev_%	ci_low_%	ci_high_%
Female	0	12	0.0	0.0	24.25
Male	4	118	3.39	1.33	8.39

Table 3. Prevalence by age group

age_group	cases	n	prev_%	ci_low_%	ci_high_%
18–29	0	21	0.0	-0.0	15.46
30–39	1	37	2.7	0.48	13.82
40–49	3	54	5.56	1.91	15.11
50–59	0	16	0.0	0.0	19.36
60–70	0	2	0.0	0.0	65.76

Table 4. Logistic regression of glaucoma risk factors

Figure 1. Age-specific prevalence with 95% CI.



Discussion

We find patterns of having the pathology went up with age and was also to having narrower angles in the eye and higher eye pressure (though still within a "normal" range). We also saw that systemic health diseases like diabetes and high blood pressure raised a person's risk.

Our study confirms that the disorder is really eye disease for survey respondents in Al-Samawah, appearing at a rate that goes what we see in other South Asian countries. Glaucoma develops when the optic nerve becomes damaged. As this nerve gradually gets worse, blind spots develop in your vision. For reasons that we don't fully understand, this nerve damage is usually related to increased pressure in the eye. Raised eye pressure happens as the result of a buildup of fluid that flows throughout the inside of the eye. This fluid, called the aqueous humor, usually drains through a tissue located at the angle where the

iris and cornea meet. This tissue is called the trabecular meshwork. The cornea is important to vision because it lets light into the eye. When the eye makes too much fluid or the drainage system doesn't work properly, eye pressure may increase. No one knows the exact reason why the optic nerve becomes damaged when eye pressure is healthy. The optic nerve may be sensitive or experience less blood flow. This limited blood flow may be caused by the buildup of fatty deposits in the arteries or other conditions that damage circulation. The buildup of fatty deposits in the arteries also is known as atherosclerosis.

Why We concentrate on This Group

We are chosen to study this this group for a simple, pressing reason: foreign labour in Iraq ,had no excess to eyecare. They typically have no access to routine eye exams , leaving them vulnerable to undetected conditions like glaucoma.

Why is it important:

First report focusing on foreigner -worker population; standardized ISGEO classification. health application: The findings is significant because they show the presence of glaucomatous damage in a worker that didn't receive eye care. Eye care programs for workers may help detect glaucoma earlier, preventing irreversible blindness.

Conclusion

The ISEGO criteria (International Society of Geographical and Epidemiological Ophthalmology) defining the diseases in terms of the impairment of the optic-nerve structure and visual-field damage, but not intraocular pressure, were used because it provided a comparatively easy three-category system across populations (Foster et al., 2002). Previously, glaucoma is a particular condition that afflicts high proportions of Pakistani worker in Iraq and the occurrence is linked to age and systemic/ocular risk factors. The results are relevant as they indicate the responsibility of the foreigner workers who do not have proper eye care.

Ethical Considerations and Consent

All participants were informed about the study objectives and procedures. Participation was voluntary, and written consent was obtained prior to examination.

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