

# Perspective Article

## Glaucoma Screening

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### Introduction

Glaucoma is one of the leading causes of preventable blindness. Due to the asymptomatic nature in early stages, the diagnosis is missed quite often. This leads to irreversible loss of vision, thereby reduction in quality of life. As per estimation there are more than 60 million cases of glaucoma worldwide and 20 million more are expected to get added by 2020<sup>1</sup>. Approximately 12% of total blindness is due to glaucoma<sup>2</sup>. Around 50% of glaucoma cases are undetected<sup>3</sup>. Chennai glaucoma study has observed that more than 90 % of the cases are unidentified. As of now glaucoma has no cure. Hence early detection and treatment is the main stay in management of glaucoma and prevention of blindness.

### Objective

The objective of screening is to pick the disease early and to prevent the potential blindness by appropriate management. Effective and economically beneficial approach is needed for early detection and further management. From the patient's point of view, regular eye checkup is the mainstay of early detection.

### Modes of screening

Screening can be done either at community level or at institutes.

#### Community screening

People can be screened at the community level by conducting regular eye camps. Torch light examination with intra-ocular pressure (IOP) measurement by non-contact tonometer or rebound tonometer and ophthalmoscopy can pick most of the cases. Those with high IOP and/or findings suggestive of glaucoma should be referred to hospitals for further management. Combined ophthalmoscopy and tonometry for all persons and perimetry for high risk persons has a sensitivity of 80%<sup>4</sup>.

#### Screening at hospitals

Govt of India has recommended opportunistic screening for people aged above 40 yrs visiting outpatient department. Other means of screening include intra-ocular pressure measurement for all patients at first visit and conducting regular glaucoma screening programs etc. Family members of glaucoma patients need to be screened regularly. Glaucoma suspects will undergo detailed examination and investigations to quantify the damage and commencement of treatment.

### Screening tests

All tests are focused on the optic nerve head to detect the presence of either structural damage or functional damage.

#### Tests to detect functional damages

Tonometry and perimetry are used to detect functional damage of the optic nerve. Goldmann Applanation Tonometry (GAT) is the gold standard to measure the intra ocular pressure. Standard Automated Perimetry (SAP) is used to detect the visual field defects whereas Frequency Doubling Perimetry (FDT) which requires lesser time can be used mainly for screening purpose.

#### Tests to detect structural damages

Optic Disc Photography, Heidelberg Retinal Tomography, Optical Coherence Tomography, Retinal Nerve Fiber Layer (RNFL) Analysis and Scanning Laser Polarimetry (SLP) are used to quantify the structural damage.

The sensitivity and specificity of each test individually is not promising. As no single test is conclusive, diagnosis and management cannot be finalized on a single test result. Combination of multiple methods somewhat aid in effective screening. Sight savers study combined IOP, FDT and a questionnaire (three tests) and the sensitivity and specificity were found to be 88.6%, and 57.1% respectively<sup>6</sup>. The ultimate aim is to find out effective and cheap methods for screening.

### Challenges

There is no definite method or combination of methods for effective screening<sup>7</sup>. Further studies are needed to customize the optimal combination of screening tests to detect glaucoma at a much earlier stage. Till then we should target the high risk individuals. Following people are at high risk for glaucoma:<sup>8</sup>

- Aged 40 years and above.
- With family history of glaucoma.
- High intraocular pressure.
- African Americans (for open-angle glaucoma).
- East Asians and people with East Asian ancestry (for closed-angle glaucoma).
- Myopes (greater risk for developing open-angle glaucoma)

Hypermetropes (greater risk for developing closed-angle glaucoma).  
Those taking corticosteroid in any form.  
With diabetes/hypertension.

## Conclusion

Screening for glaucoma not only prevents avoidable blindness but also improves the medical quality of the patient and the economic quality of the society. Though glaucoma screening is tough, the result i.e. early detection and management to prevent blindness is rewarding. Regular eye examination is proved to be the effective way of screening glaucoma as recommended by various studies. Greater focus should be on the family members as there is 10-fold increase in the risk of glaucoma among the relatives<sup>9</sup>. Better education and awareness about glaucoma go a long way in the detection of the dreaded disease<sup>10</sup>.

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