Research Article

Visual Field Mapping by Tangent Screen and Humphrey Perimetry: A Comparative Study

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Abstract

Background and Objectives: (a) To compare manual tangent screen perimetry and automated Humphrey perimetry for visual field testing, and (b) to analyze whether manual tangent screen perimetry still has a role or it should be replaced by computerized automated Humphrey perimetry in physiology labs and clinical diagnostic settings.

Methods: Study was done on 45 patients between 18 and 65 years of age that included 30 eyes of patients suffering from glaucoma/ other eye diseases giving rise to visual field defects, 5 eyes of patients suffering from neurological diseases and 10 eyes of normal subjects.

All patients underwent perimetry examination by tangent screen at 1 meter distance (and 2 meter distance, if required) and automated Humphrey perimetry by Humphrey visual field analyzer (HFA) using 30-2 'white on white' full threshold strategy. Tangent screen consists of black screen 2 meter square or 1 meter square. Accordingly, patient is seated at a distance of 2 meter or 1 meter respectively. A patient with organically constricted visual fields will show an increase in the size of the visual field when moved to a farther distance while a patient with functional visual field loss will often report the same absolute size of the field (tubular or gun-barrel field) to be consistent with their first field. This is clear evidence of functional visual field impairment.

Results: Out of 45 patients, 29 were male and 16 were female. The age cases in the study ranged from 40-79 years with mean age of 60.70 years. Tangent screen perimetry was able to detect about 5 patients with early field defects and 15 patients with moderate/ advanced field defects. On the other hand, Humphrey automated perimetry was able to detect 10 patients with early field defects and 18 patients with moderate/ advanced field defects. While only 13.33% technicians preferred tangent screen perimetry, around three-fourths of the technicians found Humphrey automated perimetry more preferable. 91.11% technicians found HVF to be technically easier because the automated perimeter eliminates observer bias, is easier to perform and also overcomes the tedium of manual perimetry. Moreover, automated perimetry also uses quantified parameters while manual perimetry does not. On evaluating sensitivity and specificity of manual tangent screen perimeter using the Humphrey automated perimeter as the standard, the tests showed that the tangent screen perimeter had 75.75% sensitivity and 88.88% specificity. Since the mean time taken was more in automated perimetry: 474.5 sec, 474 sec and 459.9 sec versus 340.5 sec, 339.1 sec, and 339.1 sec in glaucoma, neurological and normal patients respectively; more patients-66% preferred tangent screen perimetry.

Interpretation and Conclusions: Our results suggest that visual field testing with automated perimetry is superior to visual field testing with tangent screen perimetry. The automated perimeter picked up visual field defects in a larger number of eyes than the tangent screen perimeter. Visual field defects were more extensive on automated perimetry compared to tangent screen perimetry.

The advantage of the HVF analyzer also lies in its ability to make use of quantified parameters like mean deviation and corrected pattern standard deviation to detect subtle worsening of visual field defect, with statistical level of confidence.

Keywords: Glaucoma, Neurological, Perimetry, Tangent screen, Automated, Field defects.

Introduction

Understanding of the visual field extends more than 2000 years back to the time of Hippocrates, who identified a hemianopia. During the nineteenth century, quantification of visual fields was described by Jannik Bjerrum. He started mapping visual fields by asking patients to find whether a white object on the end of a black rod, in front of a black screen was seen. This method of field testing, known as the tangent screen, measures the central 30 degrees of the visual field only. The visual field refers to the total area in which objects can be seen in the side (peripheral) vision while gaze is fixed on a central point. The monocular visual field consists of central vision, including the inner 30 degrees of vision and central fixation, while the peripheral visual field extends 100 degrees laterally, 60 degrees medially, 60 degrees upward, and 75 degrees downward.

Visual field evaluation is a crucial component of the neurologic and ophthalmologic examination. Accurate visual field testing and an intelligent analysis of the results can provide the clinician with extremely useful information regarding the site and sometimes, also the type of lesion. As the visual sensory pathway of humans stretches from front to back of the brain, visual field abnormalities are present in a wide variety of neurological and ophthalmic disorders.[1] Visual field examination is an important method to diagnose glaucoma, which is characterized by raised intraocular pressure and optic disc abnormalities. Glaucoma is a chronic, progressive optic neuropathy caused by a group of ocular conditions which leads to damage of the optic nerve with loss of visual function.[1-3] Besides making a diagnosis of glaucoma, identification and determination of the extent of visual field loss are important in managing other intraocular or intracranial disorders such as optic neuritis, ischemic optic neuropathy, compressive optic neuropathy, strokes, and tumors.

Automated perimetry has become the standard for visual field examination over the last decade, replacing manual perimetry.

The goal of perimetry is to establish an accurate estimate of visual field sensitivity. Perimetry is performed to detect visual field defects, determine specific patterns of visual field loss for differential diagnosis and to monitor for evidence of progression of field loss. Conventionally, Standard Automated Perimetry has been used to achieve these purposes.[4]

Review of literature and discussion with clinicians has revealed that Tangent Screen Perimetry is being used very infrequently these days. However, undergraduate medical students are taught the basics of tangent screen perimetry only, whereas clinicians are increasingly switching over to Humphrey automated static perimetry. Automated static perimetry is now considered to be the standard for assessing visual function in glaucoma.

Thus the present study was conducted to compare tangent screen and Humphrey automated perimetry for visual field testing and to find out whether manual tangent screen perimetry still has a role or it should be replaced by computerized automated Humphrey perimetry in physiology labs and clinical diagnostic settings.

Materials and Methods

The present institute-based comparative study was undertaken at Departments of Physiology and Ophthalmology, Maulana Azad Medical College and associated Guru Nanak Eye Centre, New Delhi, from June to July 2015. The procedures followed are in accordance with ICMR's ethical guidelines for biomedical research on human participants (2006). The study included 45 patients: 30 of glaucoma, 5 of neurological diseases and 10 normal. Diagnosed cases of:

1. Glaucoma based on raised intra ocular pressure and optic disc changes by fundus examination by ophthalmologist; and
2. Other retinal pathology diagnosed by fundus examination by Ophthalmologist were taken up for the study.

Inclusion Criteria

1. At least four prior reliable visual field tests (to minimize learning curve bias),
2. Diagnosis of primary open angle glaucoma/ retinal pathology or neurological disease.

Exclusion Criteria

1. Patients below the age of 18 years and patients above the age of 65 years,

2. Patients having ocular hypertension without visual field defects,
3. Inability to provide informed consent,
4. Inability to follow commands,
5. Visual acuity worse than 6/60, and
6. Past difficulty with visual field testing, due to fixation loss or fatigue.

All patients underwent perimetry examination by:

1. Tangent screen at 1 meter distance (and 2 meter distance, if required),
2. Humphrey automated perimetry by Humphrey visual field analyzer (HFA) using 30-2 'white on white' full threshold strategy.

Tangent Screen Perimetry

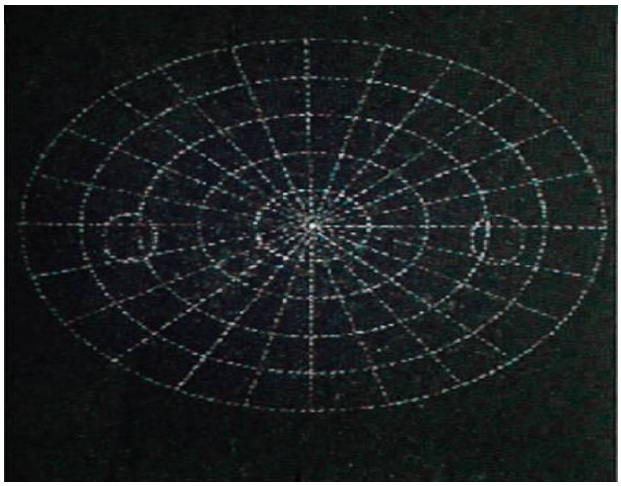

Figure 1.Tangent Screen Perimetry

Tangent screen testing uses a flat testing surface and is useful for testing the central visual field, but for testing beyond 30 degrees its value is limited. The tangent screen is usually a black felt screen mounted on a wall and testing is performed while the patient is sitting down. The screen should be well illuminated and appropriate for the specific type of test and target used. Most screens have circular white stitching or markings every 5 degrees from a central fixation spot, up to 30 degrees. The screen also has radial markings around the fixation point that start at the 180 degrees meridian and are usually spaced 22.5 degrees apart. It evaluates the central 30 degrees field at 1 meter. The test is done on each eye separately, with the opposite eye patched. Testing at 2 meter expands the field defects to twice their 1-meter size so that only 12 degrees to 15 degrees of central field is evaluated. Maintain constant monitoring of the patient's fixation throughout the entire testing procedure. Move the target from nonseeing to seeing areas. Move along the stitched meridians at a constant speed of 5 degrees per second. Do not test directly on the vertical or horizontal meridians. Test the fields using the appropriate screening protocols. Consider the Armaly/ Drance protocol for glaucoma and vertical meridian mapping for neurologic problems. To maintain consistency in visual field interpretation, standard color coding was used to document the size of the targets. Patients were seated 1 meter away from a 2×2 meter black target screen in a well-lit room. A spotlight directed from above and slightly to one side was used for additional illumination. Fixation was adjusted for height by raising or lowering the patient's chair. Patients wore spectacle correction (if they had any refractive error) and were instructed to fixate on a 1-cm white fixation target at the center of the screen. One eye was covered. Using a 3-mm diameter white test object mounted on a black wand, the field about 10 degrees to either side of the vertical and horizontal meridians was explored by moving the test object at a rate of 2 to 3 degrees per second from the periphery toward the center. Any point of disappearance or reappearance was marked with a black-headed pin. When a defect was identified, its margins were determined by moving the test object centrifugally from the defective to the seeing area. The defect was further confirmed by rotating the wand 180 degrees to make the test object appear or disappear at the same location. The density of the defect was assessed by asking the patient whether he or she could see larger white objects or could count fingers or detect any hand or finger movement in the area of field loss. The blind spot was tested to ensure patient's reliability.

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Humphrey Automated Perimetry Exam

Figure 2.Humphrey Automated Perimetry Exam

The patient sits in front of a concave dome with a target in the center. The eye that is not being tested is covered. A button is given to the patient to be used during the exam. The patient is set in front of the dome and asked to focus on the target at the center. A computer then shines lights on the inside dome and the patient clicks the button whenever a light is seen. The computer then automatically maps and calculates the patient's visual field. The central 30-2 threshold program was used for Humphrey perimetry in all patients. This program tests the central 30 degrees field at 76 points.

All patients were tested with a white, size III (4 mm^2) stimulus against a background illumination of 31.5 asb, with the other test parameters set at their default values (fixation target-central; blind spot check size-III; test speed-normal). Patient information, including age, date of test, corrective lens used (based on distance prescription with age-appropriate convex spherical add), pupil diameter, and visual acuity were entered into the machine. Patient's fixation and position were checked every 1 to 2 minutes in the video eye monitor, with adjustments made as necessary.

Perimetric charts of each patient done by both methods were compared with respect to:

1. Presence/ absence of visual field defect.
2. Type of visual field defect.

A number of questions were then asked to each patient:

1. Which test did you prefer?
2. With which machine was it easier to keep your eyes straight?
3. Have you ever had a visual field test?

The technician was then asked to fill out a questionnaire answering the following questions:

1. With which perimeter was fixation superior?
2. Which machine was easier to use?
3. Which perimeter would you prefer to use in future on this particular patient?

The mean test time for both eyes on each perimeter was recorded by the technician.

Result

The study was conducted for a period of two months. A total of 45 patients who fulfilled the inclusion criteria were included in the study, out of whom 30 patients were suffering from glaucoma/ other eye diseases giving rise to visual field defects, 5 patients were suffering from neurological diseases and 10 were normal subjects.

Age

The age cases in the study ranged from 40 to 79 years with mean age of 60.70 years (Fig. 3).

Figure 3: Analysis of the distribution of age groups of patients in the study
POAG: Primary Open Angle Glaucoma

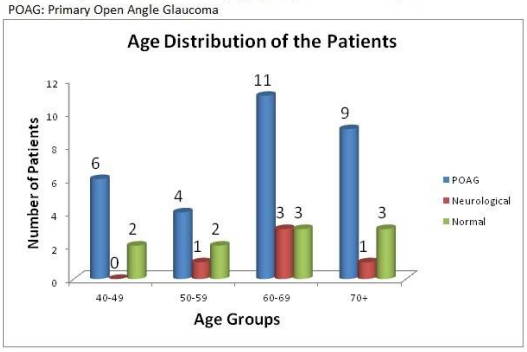

Figure 3.Agewise Distribution of Patients

Sex

Out of the total 30 POAG cases studied, 20 (66.6%) were male and 10 (33.3%) were female. Similarly, out of the total 5 neurological cases studied, 3 (60%) were male and 2 (40%) were female; whereas of the total 10 normal cases studied, there were 6 (60%) male and 4 (40%) female. [Fig. 4].

Figure 4: Sex distribution of patients in the study
POAG: Primary Open Angle Glaucoma

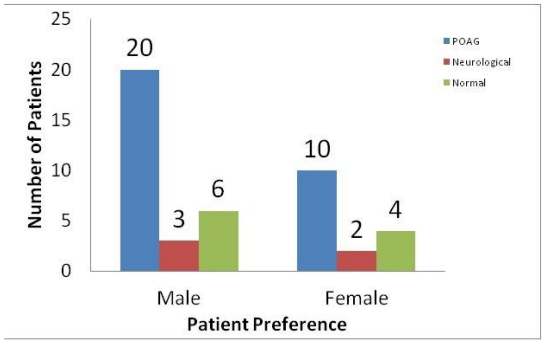

Figure 4.Distribution of Patients according to their gender

Patient Responses in Perimetry

Sixty-six percent of the patients preferred Tangent screen perimetry. Forty-eight percent of the patients found fixation was easier to maintain with the tangent screen perimeter. Twenty-four percent of patients, however, had previously had a tangent screen perimetry field test. Thirty-one percent of the patients had previously undergone Humphrey automated visual field testing (Fig. 5).

Figure 5: Chart depicting the technique of perimetry prefered by the patients in the study
HVF: Humphrey Visual Field

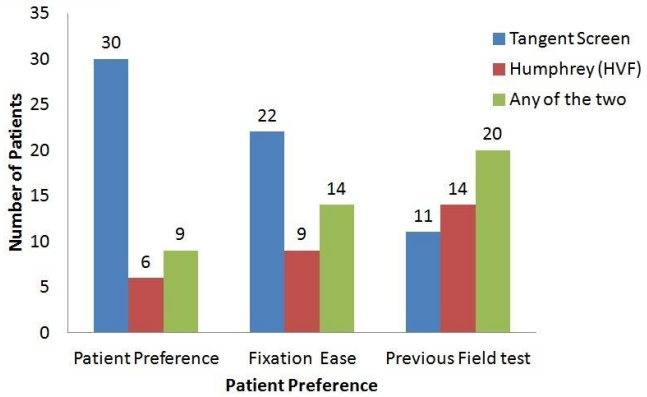

Figure 5.Technician of Petrimetry preferred by the patients in the study

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Doctor/ Technician Responses in Perimetry

68.88% technicians found fixation to be better in Humphrey automated perimetry. Similarly, 91.11% technicians found HVF to be technically easier. While only 13.33% technicians preferred Tangent Screen perimetry, around three-fourths of the technicians found Humphrey automated perimetry more preferable (Fig. 6).

Figure 6: Chart depicting the technique of perimetry prefered by the doctor/ technician in the study
HVF: Humphrey Visual Field

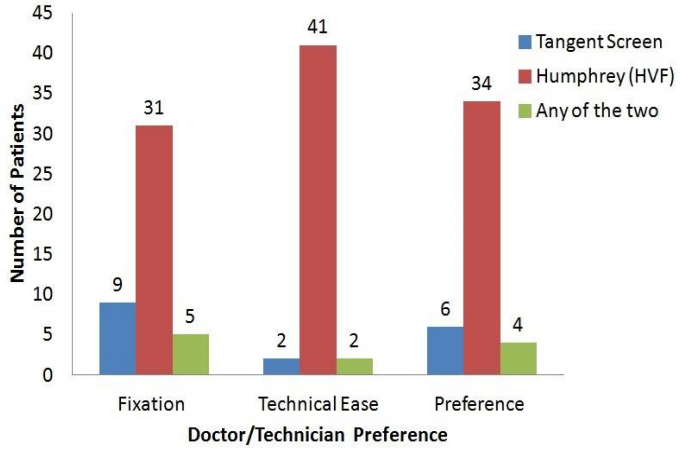
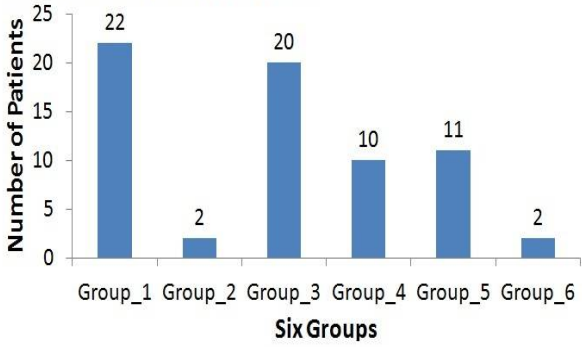


Figure 6.Technician of Petrimetry preferred by the doctor/ technician in the study

Visual Field Classification into Groups

Figure 7 depicts the classification of the visual fields into 6 groups for the purpose of analysis. Twenty-two patients were included in group 1, in which field defects were similar on Tangent screen perimetry (TSP) and Humphrey standard automated perimtery (SAP/ HVF). Two patients were included in group 2 where both fields were similar, but slightly more extensive defects were found on tangent screen perimetry. Twenty patients were included in group 3 where both fields were similar, but slightly more extensive defects were found on Humphrey automated perimtery. Ten patients were included in group 4 where both fields were normal. Eleven patients were included in group 5 where field on Tangent screen perimetry was normal, Humphrey automated perimtery was abnormal, but both tests were reliable. Finally, two patients were included in group 6 where field on Humphrey automated perimtery was normal, Tangent screen perimetry was abnormal, but both tests were reliable.

Figure 7: Classification of the Visual Field into 6 groups



Group_1: Both fields with very similar defects	Group_4: Both fields normal
Group_2: Both fields similar, but slightly more extensive defect on TSP	Group_5: TSP normal, Humphrey SAP abnormal, but both tests reliable
Group_3: Both fields similar, but slightly more extensive defect on Humphrey SAP	Group_6: Humphrey SAP normal, TSP abnormal, but both tests reliable

Figure 7.Classification of the Visual Field

Table 1.Distribution of Field Defects by Perimetry among Glaucoma Patients

	Tangent Screen Perimetry	Humphrey (HVF) Perimetry
Patients with early field defects	5	10
Patients with moderate/ advanced field defects	15	18

Table 2.Comparison of Mean Time Taken by Patients in the Two Procedures

	Tangent (seconds)	HVF (seconds)
Glaucoma	340.5 ± 2.28	474.5 ± 3.62
Normal	339.1 ± 2.96	459.9 ± 2.47
Neurological	339.1 ± 2.96	474 ± 2.92

Distribution of Field Defects by Perimetry among Glaucoma Patients

Table 1 reviews the distribution of field defects by perimetry among glaucoma patients. Tangent screen perimetry was able to detect about 5 patients with early field defects and 15 patients with moderate/ advanced field defects. On the other hand, Humphrey automated perimetry was able to detect 10 patients with early field defects and 18 patients with moderate/ advanced field defects.

Comparison of Mean Time Taken by Patients in the Two Procedures

Table 2 compares the mean time taken for determination of the visual field by the two techniques.

For all the three categories, P=<0.001: Highly significant difference between the two.

Sensitivity and Specificity

Results were analyzed according to standard methods. The sensitivity of Humphrey automated perimetry was defined as the number of abnormal Humphrey visual fields divided by the number of abnormal tangent screen visual fields expressed as a percentage.

Humphrey automated perimetry specificity was determined by dividing the number of normal Humphrey automated perimetry fields by the number of normal tangent screen visual fields expressed as a percentage.

Tangent screen automated perimetry sensitivity= abnormal tangent screen fields=25×100=75.75% abnormal Humphrey fields 33.

Tangent screen automated perimetry specificity=normal tangent screen fields=8×100=88.88% normal Humphrey fields 9. Sensitivity tests showed that the tangent screen perimeter detected 25 abnormal glaucomatous visual fields compared with 33 abnormal Humphrey automated fields (75.75%). Specificity tests showed that there were 8 normal Tangent screen perimeters compared with 9 normal Humphrey automated fields (88.88%).

Discussion

Visual field assessment is mandatory for the diagnosis and management of primary open-angle glaucoma and patients having neurological disorders.[2,5,6] Numerous perimetric devices are available. Although both techniques have their own merits and demerits, it has been observed that manual tangent screen method is a rather demanding procedure where the results are largely influenced by the skills and experience of the examiner.[7-9]

Thus, manual tangent screen perimetry has comparatively lesser importance in the clinical perspective in the field of ophthalmology in the present times.

MCI Guidelines for Medical Education[10]

While the curriculum objectives often refer to areas of knowledge or science, they are best taught in a setting of clinical relevance and hands on experience for students who assimilate and make this knowledge as part of their own working skills. Faculty member should avail of modern educational technology while teaching the students. Competency-based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real-life situations, ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans. Adequate emphasis is to be placed on cultivating logical and scientific habits of thought, clarity of expression, and independence of judgment, ability to collect and analyze the information.

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Therefore, a study was conducted to compare tangent screen and automated perimetry for visual field mapping at Department of Physiology and Department of Ophthalmology, Maulana Azad Medical College and associated Guru Nanak Eye Centre, New Delhi in the months of June and July 2015. A total of 45 patients were included in the study, out of which 30 patients were suffering from glaucoma, 5 patients were suffering from neurological diseases and 10 were normal subjects. The age range of the cases in the study was between 40-79 years with mean age of 60.70 years. There was male preponderance in our study perhaps because females have difficulty in attending the hospital without assistance.

The manual Tangent screen perimeter is widely available, economical and easy to maintain. But it requires highly skilled technicians to do repeatable visual field examination; also, it does not measure the depth of a scotoma. It gives a rapid, comprehensive coverage of the entire field and produces recognizable isopter patterns.[11] In our study, the automated perimeter picked up visual field defects in a larger number of eyes than the tangent screen perimetry. The difference was greatest for eyes with early glaucoma, which narrowed down progressively in moderate and advanced glaucoma. Visual field defects were more extensive on automated perimetry compared to tangent screen perimetry. In our study, in early glaucoma patients, field defects were picked up in 12 patients by Humphrey automated perimetry but only in 5 patients by manual tangent screen perimetry. Thus early field defects are picked up more frequently on Humphrey automated perimetry in comparison on manual tangent screen perimetry. Similarly, moderate and advanced glaucomatous field defects were picked up in 18 and 15 patients by Humphrey automated perimetry and manual tangent screen perimetry respectively. This is in agreement with results of study done by Trope and Briton[13] and Beck et al.[3,9,12] and who found that Manual Perimetry fails to detect the early diffuse loss of retinal sensitivity. It works well for the definition of the topography of the visual field defects and subsequent progression, but is less efficient in the detection of small field defects. Generalized depression of retinal sensitivity (which forms the earliest visual field defect and is often missed by the Tangent Screen Perimeter), depth of a scotoma and progression in depth of a visual field defect are better detected by Humphrey automated perimetry.[9] With Manual perimetry, there is the possibility of observer bias and it requires the technician's deep involvement in the assessment of the visual field. The automated perimeter eliminates observer bias.[9,14,15] The test is easier and can be performed by less skilled technical staff.[16] It also overcomes the tedium of manual perimetry, and operator error is completely avoided.[12,17] The problem of subjectivity of perimetrist has been eliminated by automation. Automated perimetry improves the uniformity and reproducibility of visual fields. Utilization of computers has provided new capabilities that were not possible with manual perimetry, including random presentation of targets, estimation of patient reliability and statistical evaluation of data at different levels.[17,18]

Ability to make use of quantified parameters like mean deviation and corrected pattern standard deviation to detect and quantify progression of glaucoma and neurological lesions with statistical level of confidence gives automated perimetry a clear advantage over manual tangent screen perimetry. This is beyond the detection capacity of the tangent screen perimeter.[19] One challenge of tangent screen perimetry is the lack of quantifiable parameters to detect progression of visual field defects over time.[17,20]

On analyzing patient responses in perimetry, most of the patients (66%) preferred tangent screen perimetry as it is more patient friendly, mainly due to the fact that patients find it less tiring, easier to maintain fixation and there is more interaction with examiner. This is in agreement with the observations of Birt et al.[12] On the other hand, the test procedure of Humphrey automated perimetry is more tiring because it takes more time to perform .This is in agreement with the study by Scheifer et al.[26] However on analyzing doctor/ technician responses: the technician found automated perimetry overall quite easier to perform than tangent screen perimetry. Technician preference strongly favoured Humphrey perimetry. Trope and Britton[11] found similar results. There is broad consensus regarding the superiority of Humphrey automated perimetry over the tangent screen perimetry.[9,11,21,22] Although manual tangent screen perimetry may have limited indications as in patients with severely depressed central vision, cognitive disorders, or difficulty cooperating with automated static perimetry, it may perform more reliably on manual kinetic perimetry testing.[23] Tangent screen and Goldmann perimetry allow the exploration of temporal crescent defects, and they may be more comprehensive than static automated perimetry for studying lesions in the postgeniculate pathway and lesions associated with retinal degenerations.[24]

Precise localization of lesions in neurological diseases by careful perimetry is clinically important because accurate pre-imaging localization aids physicians in selecting the most appropriate neuroimaging technique and in focusing on a specific area in question. In

addition, perimetric localization of lesions has substantial value in determining whether the pattern of a patient's visual field defect is adequately accounted for by imaging.[14] Both manual kinetic perimetry (tangent screen) and automated static perimetry (Humphrey field analyzer) are satisfactory as screening tests to detect occipital lesions.[26-34]

During tangent screen examination, the examiner could interact continuously with patients and assess their reliability. With Humphrey perimetry, the test program automatically determined fixation loss, false-positive and false-negative rates, and indicated the field as having "low patient reliability" when any one of these "reliability parameters" met the manufacturer's criteria for unreliability. The examiner interaction is less in Humphrey perimetry .This is in accordance with findings of Trope and Britton.[11]

On evaluating sensitivity and specificity of manual tangent screen perimeter using the Humphrey automated perimeter as the standard, the tests showed that the tangent screen perimeter detected 25 abnormal glaucomatous visual fields compared with 33 abnormal Humphrey automated fields (75.75%). sensitivity and specificity tests showed that there were 8 normal tangent screen perimeters compared with 9 normal Humphrey automated fields (88.88%). The results of this section of the study indicate that manual tangent screen perimeter is moderately sensitive and specific for detecting glaucomatous and neurological visual field defects. Thus our study found Humphrey automated perimeter to have distinct advantages over manual tangent screen perimetry due to following reasons:

1. Early detection of visual fields
2. Better sensitivity and specificity
3. Pick up progression of visual field defects early
4. Ability to make use of quantified parameters like mean deviation and corrected pattern standard deviation to detect subtle worsening of visual field defect, with statistical level of confidence
5. Estimation of patient reliability and statistical evaluation of data at different levels

Automated static threshold perimetry detects a substantial proportion of glaucomatous visual field defects at least 1 year before detailed manual perimetry and supports the use of automated perimetric testing for early detection of glaucomatous visual field loss among patients.[25]

It is recommended that keeping in mind the emphasis laid down by MCI regarding medical education in India, pre-clinical practical training for medical students should be in consonance with clinical applications; it is advisable that basics of automated Humphrey perimetry be also taught as it is more objective and mathematical. Manual tangent screen perimetry alone may not be sufficient clinically most of the times. It may need to be supplemented by automated Humphrey perimetry. Medical students should be imparted education with modern technology in a setting of clinical relevance. In clinical training, when medical students are exposed to automated perimetry printouts, they should be able to interpret the chart and diagnose the disease by logical and scientific analysis. This is possible only when basics of automated perimetry are taught to them during their pre-clinical semester. In recent times, advanced automated perimetric techniques are slowly becoming popular whereas we are not even teaching conventional automated perimetry techniques to pre-clinical medical students.

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Conflict of Interest: None

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Appendix

Patient Consent Form for Inclusion in the Study

Patients have the right to not sign this consent form: Refusal to sign the form will not affect their care in any way

I ..... D/o, S/o, W/o .....hereby give my consent for inclusion for study entitled **Comparison of Tangent Screen and Humphrey Perimetry for Visual Field Mapping.** I have been told the details of study plan and I understand the methodology. I hereby give my consent for clinical information and other details/ investigation of my case may be published in any medical journal/ medical books or online medical website by the convener of this study. As a result, I understand that material may be seen by general population. I understand that my name, initials and address will not be published but that anonymity cannot be guaranteed. I am willing to participate in this study and will be available for fellow up as and when needed. I can withdraw from the study at any time.

Name of Patient: ..... Name of Doctor: .....

Patient's Signature: ..... Doctor's Signature: .....

शोध कार्य में शामिल होने के लिए मरीज़ो का स्वीकृति फॉर्म

मरीज़ो को हस्ताक्षर करने या ना करने का पूरा अधिकार है | मना करने पर उनके इलाज पर कोई दुष्प्रभाव नहीं पड़ेगा |

मैं..... D/o, S/o, W/o .....अपनी लिखित स्वीकृति प्रदान करता/ करती हूँ कि मुझे शोध कार्य **Comparison of Tangent Screen and Humphrey Perimetry for Visual Field Mapping** में शामिल किया जाय | मुझे विस्तृत रूप से शोध कार्य के बारे में बता दिया गया है | मैं यह भी स्वीकृति देता/ देती हूँ कि मेरेसे सम्बंधित कोई भी सूचना किसी भी चिकित्सीय जर्नल अथवा किताब में छापी जा सकती है ताकि अन्य लोग उससे लाभ प्राप्त कर सके | मुझे मालूम है कि मेरा नाम गुप्त रखा जायेगा | मैं अपनी इच्छा से इस शोध में भाग ले रहा/ रही हूँ और जब मुझे बुलाया जाएगा मैं अवश्य आऊँगा/ आऊँगी | मैं अपनी इच्छा से इस शोध कार्य को छोड़ सकता/ सकती हूँ |

मरीज़ का नाम: ..... डॉक्टर का नाम: .....

मरीज़ के हस्ताक्षर: ..... डॉक्टर के हस्ताक्षर: .....

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