# Workshop on Strategic Planning for Glaucoma Management

**Date: 23rd to 24th November 2013**
**Venue: Advanced Eye Centre, PGIMER, Chandigarh**

**DAY 1: 23rd Nov 2013**

## Introduction & objectives of the program:

The national Meet on Glaucoma organized by Vision 2020: The Right to Sight-India was held to bring together all the agencies, organizations, professional bodies, institutions and individuals involved in glaucoma screening and treatment, to increase awareness of glaucoma, to identify priorities for control, and develop short and medium terms strategic plans.

## Agenda of the workshop:

The agenda of the workshop was to try and reach an agreement on strategies to be adopted (e.g. Early detection of Glaucoma; approaches to case detection/screening; treatment methods; R&D); and to formulate Strategic Plans for Glaucoma for 3 to 5 years.

## The plan of action was as follows:

Short term:

- Develop a National working group on Glaucoma
- Raise awareness of national glaucoma guidelines among professional groups
- Improve coverage of high quality glaucoma programmes.

Medium to long term:

- Strategic plan to expand coverage of glaucoma programmes
- Initiate wide scale public awareness initiatives
- Identify areas need further strengthening
- Identify potential donors and supporters for the Glaucoma strategic plan

## Welcome address by Prof. Amod Gupta

Prof Amod Gupta, Head, Advanced Eye Centre, PGIMER Chandigarh chaired the inaugural session. He welcomed all delegates and expressed his happiness at the initiative taken by VISION 2020 to draw a roadmap to formulate a National Plan to tackle the problem of glaucoma in the country. He re-iterated that after the successful cataract surgery programme, attention was now being directed to the problems of glaucoma, diabetic retinopathy and childhood blindness. He said the major challenge was how to diagnose the disease at the patients' doorstep and how to tackle the large percentage of undiagnosed cases in the community.

He emphasized that the problem of undiagnosed disease cuts across all socio-economic classes, and the need of the hour was to develop effective screening tools that could be incorporated within the comprehensive eye examination to be able to diagnose the disease effectively. He suggested the emphasis should be to use simple tools like the torch light examination for pupillary abnormalities and the direct ophthalmoscope to be able to detect obvious glaucomatous damage and diabetic retinopathy also.

## Address by Col. Dr. M Deshpande

Col Dr M Deshpande, President Vision 2020 thanked Prof Gupta for accepting to hold the workshop at PGI. He apprised everyone about the thematic workshops in various sub-specialities conducted by Vision 2020 to focus on felt-needs to reduce the burden of low vision in India. He said Vision 2020 strived for effective implementation of goals at the National level with effective use of existing infrastructure and resources.

He said the NPCB provided a one-time solution by paying for cataract surgery, but diseases like glaucoma and diabetic retinopathy required lifelong follow-up and care. He expressed concern that the funds reaching various centres during the process of upgradation of facilities may not be utilized in the management of glaucoma patients. He re-iterated the need to have glaucoma awareness drives at the National level to increase awareness about this potentially irreversibly blinding condition, He said there appeared to be a dilemma regarding the effectively of population screening for glaucoma. He said as yet there was not even an agreement about what is the basic equipment required for glaucoma screening.

## Address by Dr GV Rao

Dr GV Rao, CEO, Vision 2020, welcomed everyone to the Glaucoma workshop. He initiated introductions by all participants. He then summarized the purpose of the meeting and hoped that at the end of the workshop there would be a roadmap to present to the Govt for an effective National Plan to tackle the largely undiagnosed problem of glaucoma in the community.

## The following participants introduced themselves

Prof Amod Gupta. Head, Advanced Eye Centre, PGIMER, Chandigarh (AG)
Prof SS Pandav, Advanced Eye Centre, PGIMER, Chandigarh (SSP)
Prof Ramanjit Sihota, Dr RP Centre of Ophthalmic Sciences, AIIMS, New Delhi (RS)
Prof JC Das, Shroff Eye Centre, New Delhi, (JCD), President, Glaucoma Society of India
Dr Sushmita Kaushik, Advanced Eye Centre, PGIMER, Chandigarh (SK),
Secretary, Glaucoma Society of India
Dr Suneeta Dubey, Shroff Charity Eye Hospital, New Delhi (SD), Treasurer, Glaucoma Society of India
Dr Devindra Sood, Eye Q Institute, New Delhi, Past President, Glaucoma Society of India
Dr Harsh Kumar, Centre for Sight, New Delhi (HK)
Dr. Priyanka Roy, Convener, Glaucoma Support Group, Chandigarh (PR).
Dr Vinay Nangia, Suraj Eye Hospital, Nagpur (VN)
Dr Praveen Vashisht, RP Centre of Ophthalmic Sciences, AIIMS, New Delhi (PV)
Brig JKS Parihar, R& R Hospital, Delhi Cantt, New Delhi (JKS)
Dr Mayuri Khamar, Raghudeep Eye Clinic, Ahmedabad, (MK)
Dr Asim Seal, Ramakrishna Mission Hospital, Narendrapur, W. Bengal (AS)
Dr Mariam Mansuri, RIO, Ahmedabad (MM)
Dr Srishti Raj, Advanced Eye Centre, PGIMER, Chandigarh (SR)
Dr Ashok Choudhry, SightFirst, LCIF. (AC)
Dr Harpreet Kapoor, CBM (Harpreet)
Dr Rohan Chariwala (RC)
Dr Ashish Bajaj (AB)
Mr Anurag Dhingra. In charge glaucoma portfolio, Alcon India (AD)
Mr Rajeev Single, Forus (Rajeev)
Mr Uday Kumar, Senior Optometrist, Glaucoma Service, LVPEI, Hyderabad (UK)
Col Dr M Deshpande, President Vision 2020 (MD)
Dr GV Rao, CEO, Vision 2020 (GVR)

## Presentations made by the speakers, discussion points and question answers

### Session 1: Update on Glaucoma

**Presentation on** - *"Update on Glaucoma care in India, and challenges"*
**Speaker** **-** Dr J C Das, President, Glaucoma society of India (GSI)

Prof Das spoke about the magnitude of the problem of glaucoma in India and challenges faced. The highlights of his presentation are as follows:

**Magnitude of glaucoma in India:**

**Limited studies available:** Vellore Eye Survey, Andhra Pradesh Eye Disease Study, Arvind Comprehensive Eye Survey, Chennai Glaucoma Study, West Bengal Glaucoma Study.

40 million of estimated 309 million population of aged 40 or above in India have either glaucoma or are at risk of developing glaucoma. That means that every eighth individual after the age of 40 is either has glaucoma or at risk of developing glaucoma. This does not include Paediatric glaucoma, secondary glaucoma and glaucoma associated with systemic diseases.

POAG – 6.48 million; PACG - 2.54 million; PACD (Primary angle closure disease) – 27.6 million. With a rapidly growing ageing population this figure (11.2 million) is likely to increase to 16 million by 2020. The rate of undiagnosed glaucoma cases is 90% (in contrast to 40-60 % in developed countries) Most of them present either visually disabled or permanently blind. Nearly half of the patients diagnosed as having glaucoma had already visited an ophthalmologist and remained undiagnosed. A significant number of patients diagnosed with POAG when re-examined were found to have PACG ( Chennai Study).

**Difficulties in Diagnosis:** Lack of existing manpower and infrastructure; inadequate training and examination skills; Poor standard of residential training; Inadequate trained personnel – Paramedical staff and ophthalmologist; Lack of use of modern equipment.
In a survey conducted by Glaucoma Society of India among its delegates showed 40% of glaucoma specialists use Schiotz Tonometer and NCT; 45% record IOP, Gonioscopy and ONH examination. Ministry of health through DNB courses and MCI through their modified curriculum have stressed the need for better standard of training.

**Screening of Glaucoma:** The only effective way is through comprehensive eye examination. Counsellors might help effectively in screening family members of glaucoma patients e.g., Local bodies, NGOs, Lions club and others.

Arvind Eye Care System: Performs opportunistic screening by comprehensive eye examination using tonometers, gonioscopy, ONH examination and VF by trained personnel's.

LV Prasad Eye Institute: Targets rural areas where 70% of population resides. Eye health pyramid of LV Prasad has a village vision complex system which has been effective in providing affordable comprehensive eye care in rural India.

**Treatment of Glaucoma:** Medical management is the mainstay of treatment, but its expensive, availability is a problem. Generic preparations are now available

Non compliance / Adherence / Persistency is a major issue. The causes could be
Lack of knowing & awareness; Non availability of drugs; Cost of medication; Socio-economic status; on-availability of other members of the family; Pre existing disease – depression; Inability to use medication; Impaired quality of life; side effects of drugs; False sense of security after laser/surgery.

**Challenges to Manage Glaucoma**

1. Collection of correct database about glaucoma
   - A nationwide, multicentre, scientifically well designed and well monitored screening programme
2. Lack of skilled manpower development
   - Para medical staff; Ophthalmologists
3. Lack of standardised residency training

**What is required:**

- Development of infrastructure including rural areas
- Availability of affordable drugs
- To take care of misdiagnosis and over diagnosis of glaucoma
- To develop optimal comprehensive clinical skill and practice pattern to detect and manage glaucoma
- To increase awareness and knowledge about preventable nature of glaucoma blindness through various media
- To use advanced technologies like telemedicine
- Research on genetic basis of childhood glaucoma will be one step forward in glaucoma management

**Discussion**

AG: We need to change nomenclature. Kaala motia and safed motia creates confusion. People think like safed motia kala motia is also an easily curable disease.

JCD: I think the term kaala motia is more frightening to the patient and they link it as if its a malignant disease!.

HK: I agree with Prof Amod that the term kala motia is misleading. Maybe we can change it to kaala paani.

RS: We also need to talk about what we can do about increasing this awareness at the PHC/District level. Tertiary care centres do well, but we are just scratching 10% of the problem. Its good that we are meeting for discussing this problem and are focussing on glaucoma at a National meet. If we can decide how to catch the disease at the PHC or even District level, it will be a good beginning.

AG: I agree. The real challenge is how to detect glaucoma in the community.

RS: I think we should not run down the Schiotz tonometer and direct ophthalmoscope. They are good handy tools that can be very effectively used for screening for glaucoma.

AG: We are inadvertently discouraging the use of the direct ophthalmoscope at the tertiary level and I am also guilty of that! I think one of our recommendations must be to mandate the use of direct ophthlamoscopy in not just residency but also MBBS level so that every doctor at least knows how to look into the eye. Maybe effective screening for glaucoma could start with just an estimation of the anterior chamber depth and direct ophthalmoscope.

MD: I think we should be thinking of realities on the ground in the field. We should be involving private practitioners at the district level also.

AG: We need to create screening modules and adopt the ones which work the best.

SSP: There is also shortage of trained manpower. Even those trained in glaucoma move away to probably more lucrative fields like cataract refractive surgery and retina. I have noticed a trend of less people opting for glaucoma.

AG: Yes that's a valid point. Diabetic retinopathy and glaucoma have to go into the purview of the comprehensive ophthalmologist.

**Dr Harpreet Kapoor** then apprised everyone of the work being done by the CBM. CBM had a mission to reduce disability, especially blindness, and now glaucoma was in focus. She said low vision rehabilitation has been a priority for the organization.

Dr Ashok Choudhry then addressed all participants and apprised all about activities of the SightFirst Program of Lions Club International Foundation. He said Lions Clubs International Foundation's SightFirst program funds the efforts of Lions, nongovernmental organizations, government agencies and others to fight the major causes of preventable and reversible blindness through the support of eye health care delivery systems, training and infrastructure development. He said in India, there are 300,000 Lions working in 600 Lions Clubs. There are 150 Lions Club Hospitals. There were working in partnership with L.V.Prasad Eye Institute, Arvind Eyecare System, 'Sankara Nethralaya and R.P. Centre, AIIMS and many others. The funding is to the tune of 100 million UD dollars all over India. He listed the following Sight First programs underway in India:-

- New Eye Hospitals- support, infrastructure, building, training etc
- Mobile Vans
- Capacity building by upgrading existing eye institutes
- Support for cataract surgery programme
- Manpower development
- Tele-ophthalmology for Diabetic retinopathy by encouraging community based screening
- Refractive error screening of 10 million children so far.

**Discussion**

HK: What is the plan of Sight First Program for glaucoma?
AC: Now the focus is on glaucoma and we have to work out the modalities

RS: What about Low Vision Aids? Whom can we contact? Let us at least organize providing LVA services to our patients. If the facilities could be mapped and put up on a website it would be useful.

JCD: Are all Lions eye hospitals in urban areas?

AC: No most of LIONS hospitals are in the periphery.

RS: I think the problem is of co-ordination. There is so much work going on but its scattered and we don't know whom to contact. If there will be one place or one website where we could all visit. Where information's about all services could be

available- if nothing at least a mapping of eye care facilities. I think our meeting thrust should be on co-ordination and mapping available services.

HK: CBM procures LVA free of cost for patients of all CBM partners.

AS: I want to point out that LVA for glaucoma is not an easy proposition, because the visual loss is usually peripheral and not central, in contrast to that due to ARMD. Training patients to use LVA for ARMD is relatively earlier. But for glaucoma a lot of training is required. For instance they need to be taught how to use the head posture effectively for the visual field expanders to be of use.

**Mr Anurag Dhingra** from Alcon India then outlined the activities of Alcon in delivery of eyecare. He said Alcon had partnered with ORBIS for the purpose. Now the focus was on Glaucoma and Alcon had partnered with the GSI for that. During the World Glaucoma Week, Alcon had participated in 7 screening camps and numerous radio programs for spreading glaucoma awareness. It had provided an educational support to GSI in bringing out a primer for glaucoma management compiled by senior faculty of the GSI.

**Mr Rajeev Single** from FORUS told the participants about a low cost device developed for glaucoma screening by FORUS. It was called the 3netra, and comprised a low-cost non-mydriatric fundus camera, which could take a picture of the optic disc, and transfer it to a reading centre by internet. It also had software to delineate the dimensions of the optic disc and analyze the various measurements. It had the ability to take anterior segment image and also had an inbuilt refractometer. It connects primary care centres to secondary or tertiary care centres through telemedicine for remote diagnosis. The cost was 5 lakhs.

**Discussion**

AG: This looks very promising. Since you are an innovative company, maybe you could think of incorporating an NCT in it, that will make it a complete screening tool for glaucoma. Ultimately all screening solutions will come from IT.

RS: Yes I will take this feedback to the engineers and let's see what's possible.

UK: You must be careful about the quality of disc pictures also since a lot of misdiagnosis is possible. And the early glaucoma will get missed.

RS: We need to concentrate upon identifying the moderate glaucoma. Not the very early ones. Screening should include a pupil examination by torch light.

## Session 2: Glaucoma Programs

**Presentation on** - *"Update on Glaucoma care in India, and challenges"*
**Speaker** **-** Dr Suneeta Dubey, SCEH, New Delhi, Treasurer, GSI

Glaucoma is the third most common cause of blindness and is responsible for 10% of blindness worldwide. Recent estimates suggest that in 2010 approximately 60.5 million people were affected by glaucoma and about 8.4 million were blind from the disease
The projections for 2020 are that almost 80 million people will be affected by glaucoma in India. There are now an estimated 12 million people affected by glaucoma in India, the majority of whom are undiagnosed By 2020, this is expected to be 16 million.

The Problem….Asymptomatic; Glaucoma is undiagnosed in 50% of cases in the western world, with higher figures in specific ethnicities. Half of the cases suffer from moderate to advanced disease in the worse eye upon first presentation even in nations with high socio economic standards.

Glaucoma, a leading cause of blindness, has traditionally been managed by both general ophthalmologists and glaucoma subspecialists. There are an estimated 12,000 ophthalmologists (about one per 100,000 population in India) Located mainly in the cities. Population-based screening of some sort, for eye disease is popular. A good screening test should be cheap, easy to administer, safe, quick, well accepted by probands and effectively discriminates normal from all subjects. False negatives unacceptably delay proper diagnosis, thus increasing the burden of disease. False positives generate direct costs due to unneeded further and more sophisticated testing and treatment.

**Screening Strategies:** Tonometry performs very poorly, particularly in sensitivity, for glaucoma screening Many other methods have been proposed, based on the study of eye morphology (optic nerve head, ganglion cell or retinal nerve fiber layer analysis-HRT ,OCT,GDX), flash light /van herricks test and/or evaluation of function. But their recommendation for screening of the general population is supported by poor-quality evidence. Substantial lack of evidence about the opportunity and cost effectiveness of mass glaucoma screening and we even know too little about how to best minimize future visual disability. Presently, no single test can discriminate glaucoma from normality accurately enough to be effective for screening.

**Over Diagnosis:** Many solo practitioners use only tonometer as the basis for treatment
In this scenario the ophthalmologists overestimate the benefit of therapy while underestimating the associated risk of treatment. Over-reliance on newer glaucoma diagnostics (such as HRT, OCT,GDX) leads to over-diagnosing glaucoma if it is interpreted in isolation without taking into consideration the complete clinical picture.

Diagnosis of asymptomatic glaucoma is mostly opportunistic. Every patient visiting an eye clinic, irrespective of presenting complaints must undergo a comprehensive eye examination. Subjects with early disease who do not undergo eye examination are obviously undiagnosed. Case detection presents the unique opportunity to prevent blindness from glaucoma Population attributable risk percentage (PAR%)is 65% ( PAC to early PACG) and 8.5% ( Ocular HT to Glaucoma). In order to achieve that goal, detection of 'early' disease (PAC; early PACG) prior to functional loss is important
In addition to vision measurement, refraction and assessment of the pupil reflex, examination include biomicroscopy, tonometry (preferably applanation), gonioscopy, and a dilated fundus examination with emphasis on the disc and posterior pole.

**Missed Diagnosis:** The diagnosis may be missed in up to half of the cases even among subjects who do see ophthalmologists or optometrists for routine examinations due to lack of comprehensive Eye Examination.

**Wrong Diagnosis:** In the Chennai Glaucoma Survey, nearly 50% of newly diagnosed glaucoma patients had an eye checkup in the previous year, of this less than 20% were diagnosed with glaucoma. 40% of diagnosed open-angle glaucoma patients actually had angle closure. Inability to perform the test or not performing a comprehensive ophthalmic examination.

**Barriers precluding comprehensive examination:** Excessive workload; Lack of adequate facilities for diagnosis and surgical intervention; Cost of slit lamps, applanation tonometers, and diagnostic lenses; Priority in well equipped centers: ? Excimer laser, Phaco machines - more revenue generating; Funding agencies focus on numbers rather than outcomes; Monitoring requires reporting of functional outcomes rather than number of operations performed; Lack of appropriate attitude and examination related to residency training. Comprehensive eye examinations are routine in few residency training programs and automated perimeters, even if provided, are rarely used. The other major problem is that glaucoma surgery is not taught routinely in residency

programs. Surgical training in most residency programs is geared toward cataract surgery. Unlike cataract surgery, glaucoma management (including surgery) cannot be taught in a quick 1 month course.

In this setting, teaching of glaucoma diagnosis, let alone surgery, is almost nonexistent. Poor leadership, improper attitude and lack of accountability It is important that residents be trained in modern examination, diagnostic and surgical techniques:
Good comprehensive ophthalmologists. Additionally, training and eye care in teaching departments should conform to modern standards and follow preferred practice patterns.

Management Challenges:

**Overtreatment/ under treatment**

**Overtreatment:** Nearly half of the "glaucoma patients" using ocular hypotensive medication do not need the medications or are over-treated. Improper workup and lack of infrastructure in the clinic coupled with fear of blindness due to glaucoma end up in over-treatment in many situations. It is not uncommon to find prescriptions for multiple topical drugs for glaucoma with no disc and field changes with a history of the highest IOP recorded being less than 25 mm of Hg.

**Under-treatment:** Under-treatment is another issue and is usually encountered in advanced stages of the disease. Over the past 16 years, the proportion of ophthalmologists providing incisional glaucoma surgery has declined significantly. At the same time, the proportion of incisional glaucoma surgery provided by high-volume glaucoma surgeons has more than doubled. Highlighting the fact that even recently trained ophthalmologists are opting not to provide incisional glaucoma surgery. Glaucoma surgery has become a more sub specialized field of ophthalmology. Increasingly has been concentrated in the hands of a small number of high-volume surgeons. This trend will have important implications for stakeholders from policy makers and hospitals to academic departments and residency education programs.

**Lack of public awareness:** Patients do not understand the crucial importance of preventive eye care or are not aware of their own risk for glaucoma. Under-diagnosis of glaucoma is either a result of patients not presenting to their ophthalmologist at all or on time.

**Lack of access to eye care:** Some patients do not have access to professional eye care because of insufficient financial resources or no means of transportation; Poor Adherence to Medications

**The Role of Education and Health Literacy:** Education level can affect adherence to medication regimens because of apparent difficulties in understanding the prescribed regimen When broken down by education level, 58% of those who did not complete high school were unable to describe their medication regimen accurately (mean score, 65%), Compared with only 21% of patients who had completed high school (mean score, 87%). After receiving written instruction, the accuracy of reporting improved significantly. The physician has to obtain a detailed and comprehensive history about actual medication use and to try to understand and find innovative solutions to patient-specific situational and environmental barriers.

Findings about the many factors affecting adherence—for example, cost (33% reported that their insurance did not pay for glaucoma medications) Polypharmacy (86% were taking more than 1 kind of glaucoma medication). Complex dosing regimens (more than 50% said that taking only 1 drop per day would make it easier to adhere to their regimen.

The logistics of detection and management of glaucoma are complex and cannot be approached in isolation. To achieve any degree of success glaucoma care must be integrated with the delivery of comprehensive eye care. Integration requires a drastic change in philosophy that is difficult for glaucoma surgeons, other specialists, and funding agencies to accept Holistic approach to blindness rather than numerically oriented cataract surgery. Improvement in residency training programs is required to provide good comprehensive ophthalmologists with not just the training but also the attitude required to implement this holistic integrated approach

A statement often used by a learned professor "We smell cataract and forget about everything else and when we can't even smell cataract, we start anti glaucoma medications……

**Presentation on** - *"Role of Tertiary Glaucoma Centres of Excellence in capacity building"*
**Speaker** **-** Dr Mayuri Khamar

Capacity building is also referred to as capacity development. It is a conceptual approach to identify the problem and find the solution within the community. Goal of capacity building is to tackle problems related to policy and methods of development, while considering the potential, limits and needs of the people of the country Capacity building involves identifying the problem and finding and implementing a local solution without relying on external resources.

## What is Tertiary Care Glaucoma center of excellence?

- Reputation and creditability in society with Leadership position
- State of Art Infrastructure : Diagnosis & treatment
- All level Manpower – Experienced doctors of great repute
- Capability for Training - Subspecialists and trainers
- Research

## Tertiary Care Glaucoma centers of excellence

- Diagnosis & treatment of complicated problems
- Set the Educational standards
- Research on the various issues
- Advocacy to the society (patient, relatives, mass media)

## How it can be of help in capacity building ?

Identify local problem; also suggest solutions; Champions in execution; Helps in implementing it; Training of health workers of all levels

But can we reach out to the whole population?

## TEAM WORK

**Community Level**
(Health care workers, G.P.s, trained NGO)

- Vision loss
- Identify the population at risk (eg. Family history)
- Refer those with problems
- Follow them
- Create awareness

**CHC/ PHC Level**
(Ophthalmic assistant / Vision Technician, medical staff)

- History
- IOP
- Optic nerve
- A/C depth –Torch light or Van Herrick's
- Refer & F/U

**Secondary Care**
(Ophthalmologist, Ophthalmic assistant, Other medical staff, Managers, Equipment technicians)

- History Slit lamp
- Applanation tonometry
- Gonioscopy
- Optic nerve; Visual fields
- Medical and Surgical Rx

**CME / Seminar**

- Training of glaucoma management
- One time training is not enough in medical field
- Useful for staff assigned for new clinical task
- Discussing the common issues/ problems
- CME program gives opportunity to peer group for interaction with local group/ hear about new ideas.

**Advances and updates**

- Imp. Tool in keeping one abreast of newer development & skills
- Helps in fulfilling pt.'s expectations
- Fellowship/ Observer-ship
- Hands on training

**Involve the community**

- Make them partner in combating this problem
- Public education/ awareness
- Display : Slide show, posters, pamphlets
- Public education
  Media involvement : Advertisements, news paper articles , Radio / TV programs

**Public education/awareness**

- Organize meetings with different groups
- School college students / teachers
- Laughing club, morning walkers
- Lions / Rotary
- Involve celebrities, religious leaders
- Glaucoma awareness day/ week

**Advocacy & Public Awareness**

- Various guidelines and training manuals need to be made available
- Workshops should be organized involving the ophthalmologists and communication experts.

- Annual Plan must have  specific time bound activities

**GLAUCOMA meaning**

**G**et information
**L**et people be aware
**A**ttitude for results
**U**tilize all resources
**C**over all areas of population
**O**bserve progress
**M**anage the problems
**A**ct for results

**Presentation on** - *"RP Centre Model for Service Delivery"*
**Speaker** **-** Prof. Ramanjit Sihota

## Patient population

- Large nos of Glaucoma suspects
- 1/3 each of CPACG, POAG & Secondary glaucomas
- 90 % advanced
- 25 % unilaterally blind
- 50 % bilaterally handicapped
- 15 % bilaterally blind
- 90 % have no insurance / reimbursement

## Screening for Glaucoma in R P Centre

- ↑ IOP with deep AC & open angle but no ONH abnormality
- ATn > 21 mmHg
- Diurnal phasing
- Perimetry
- Imaging of ONH – HRT

## Referral to Glaucoma clinic & review for risk factors

- ONH abnormality with deep AC & open angle
- ATn > 18 mmHg
- Diurnal phasing
- Perimetry

Shallow AC without iris changes
    Gonioscopy
        Occludable angle with no synechiae – review 6/12
        Occludable angle with synechiae – Refer to Glaucoma clinic
Shallow AC with iris changes, but no ↑ IOP or ONH abnormalities
    Gonioscopy
    Occludable angle with synechiae
Nd YAG iridotomy
    1 month later diurnal phasing
    Assess severity of damage ➔'Target' IOP range
Optic nerve head
        Perimetry
        Risk factors
Systemic work-up
    DM, IHD, CVA, vascular occlusions

## Management algorithm for Glaucoma

Grading the severity of Glaucomatous damage – perimetry & ONH analysis
Additional risk factors
Assessing pt socioeconomic status, compliance.
Medical therapy

≤ 25mmHg - Single drop trial one/ both eyes, if efficacious continue, else switch
25 – 30 mmHg – single drop for efficacy then add another
>30 mmHg - Tab Diamox for 3 days, with a single drug, if effective, add another

Indications for surgery - IOP above 'target' despite maximally tolerated medical therapy

Severe glaucoma POAG / CPACG - 5 yrs

43.3% showed perimetric deterioration
20% in 3.0±2.4 points
A third showed an expansion
Median time to detection - 10-2 vs 30-2 was 36.29 and 49.5 months
Correlated with IOP fluctuation & longer follow up

Long term CPACG

78.4 % control of IOP and stable fields
35 % - trabeculectomy
'Target' pressure - 14 – 18 mmHg
Closer review - greater field defect

Secondary glaucoma

Hospital

1/3 rd of all glaucoma patients
21.84%, trauma 13%, corneo-iridic scar 12%, aphakia 11%, neovascular glaucoma

Surveys

0.21% - 0.3% Secondary glaucoma

Presume ONH has no predisposition to damage
Pts younger; 'Target' may be a little higher; Surgery only after control of inflammation
Steroid induced glaucoma; Control IOP with maximal medical therapy
Taper Rx over months; Surgery only if > 50 mmHg baseline or > 30 mmHg on medication

Surgery ?

Definite IOP reduction
Maintained
Prolonged

Primary / secondary

Target IOP with minimal fluctuations, using pt appropriate Rx
MUST review 6 monthly
Age ⇒↑ IOP
Periodic angle closure continues

Corrective measures now

Glaucoma training – residency paramedical
Government initiatives
-↑ Glaucoma awareness in District hospitals/ Medical colleges
Glaucoma surgery training for trainers

Subsidize travel costs
Glaucoma registration to ensure follow-up.
Comprehensive eye examination at cataract screening camps
2.11 x $10^7$ cataracts / year
Right age group
Nonmydriatic fundus camera / HRT
NCT/ Schiotz
Anterior segment / ASOCT

Nayana: Mobile Van equipped with-
Slit lamp
Humphrey field analyzer
YAG Laser
Fundus camera
Perkins Tonometer
90D lens and gonioscope
B scan and Ultrasound Bio microscope

Fixed resource centers for tele-ophthalmology
Village Resource Centers for development
Indian Space Research Organization initiative
Communication and remote sensing satellite; services – telemedicine, tele-health education, tele education, weather, farmer advisory services, natural resource management, e governance
445 nodes in various states

All India Institute of Medical Sciences (AIIMS), New Delhi
Total Nodes – 50
Pan African e-Network & SAARC Telemedicine Network Project
Activities – Tele-education & healthcare
Immediate –
Secondary glaucomas
High risk targeting – cataract camps – ASOCT & YI
Short term - ASOCT screening population

Long term
There is a dire need of human and infrastructural facilities for adequate management of glaucoma greater access to women and the illiterate
<7% of persons with vision problems presented to free screening camps in India women and those living >3 km less likely to attend.
Stigma, fatalism and ageism are limiting factors

## Future developments

Continuing research
Safe & titratable lasers - filtering or cyclodestructive
Glaucoma medication implants
Identify high risk individuals in underserved areas
Provide comprehensive ocular examination

Ensure
Referral
Therapy
Follow up

Aim
Achieve 'target' range; Least possible medication; Least disruption of lifestyle – economic / social; Stabilize – ONH anatomy & function

Screening

Frequency-doubling technology (FDT; C-20-1) was significantly more sensitive than ophthalmoscopy (30, 95% credible interval [CrI] 0–62) and Goldmann applanation tonometry (GAT; 45, 95% CrI 17–68), whereas threshold standard automated perimetry (SAP) and Heidelberg Retinal Tomography (HRT II) were both more sensitive than GAT (41, 95% CrI 14–64 and 39, 95% CrI 3–64, respectively). GAT was more specific than both FDT C-20-5 (19, 95% CrI 0-53) and threshold SAP (14, 95% CrI 1-37). Judging performance by diagnostic odds ratio, FDT, oculokinetic perimetry, and HRT II are promising tests. Ophthalmoscopy, SAP, retinal photography, and GAT had relatively poor performance as single tests.

We did not identify any study that addressed whether participation in an OAG screening-based program leads to less visual impairment when compared with no screening or another screening-based program.

We did not identify any study that addressed whether participation in an OAG screening-based program leads to improvements in patient-reported outcomes when compared with no screening or another screening-based program.

Direct ophthlamoscopy
Both ophthalmoscopic techniques tended to underestimate VCDR cf HRT
*Optom Vis Sci. 2003 Jun;80(6):454-9*

The 2 SD for the agreement between stereo photographs and HRT, DISCAM and ophthalmoscopy were 0.31, 0.31 and 0.28, respectively
*Clin Experiment Ophthalmol. 2005 Jun;33(3):259-63*

Portable, cheap, relatively accurate
Perimetry
Tangent screen & Goldmann perimetry best for location & extent of lesions
*Ophthalmology. 2000 Mar;107(3):527-44*

Less time, better co-operation of pt, simple interpretation.
Feasibility re infrastructure & finances
Schiotz tonometry
Schiotz = Applanation in children, normal & scarred corneas
*Graefes. 200; 246:1463*
*Ind J Ophthalmol. 2000;48:25-32*

Screening – Brisbane. Schiotz most corr with GAT cf Perkins & Tonopen
*Aust N Z J Ophthalmol. 1995 Aug;23(3):173-8.*

Portability, cost and comparable reliability
*J Am Optom Assoc. 1989 Feb;60(2):105-10.*

Appropriate glaucoma therapy
Factors ∞ Lifelong disease, necessity for review, old age, care givers

Surgical
Medical = surgical
Medical / laser $\rightarrow$ surgery
Treatment modality in community

**Glaucoma surgery rate**

- For a population of one million, those > 40 years at risk is 25% = 250,000.

- Prevalence of glaucoma over 40 years is 1-2% = 2,500 - 5,000 cases.
- 50% have early glaucoma, 10% are already blind, and 40% (2,000 cases) have moderate, detectable, and treatable glaucoma.
- Cases with moderate / intermediate disease are the priority target group for community case detection and surgery.
- Therefore, each year the glaucoma surgery rate should be about 500 per million population.

**Problems:**

Pts confuse cataract with glaucoma
Do not understand the need for lifelong review
Return only after losing further vision

**Controllable factors**

Patient

Poor understanding of timings – bd, Q8H…
Compliance with Rx & review
Steroid use – asthma, skin, homeopathy

Ophthalmologist

Knowledge of systemic problems e.g. HT, Parkinsonism, depression
Tonometry 3/12, DV when reqd
Relatives of patients with glaucoma should be assessed to prevent morbidity
Appropriate glaucoma therapy in non-industrialized nations

**Goals for Glaucoma Management**

- To achieve target IOP and reduce IOP fluctuations with minimal possible medications
- To administer glaucoma medications which have the least side effects on the quality of life of the patient
- To achieve this treatment at an affordable and sustainable cost for the patient
- Monitor the structure and function of the optic nerve for further damage and adjust the target IOP to a lower level if deterioration occurs.
- To treat non-IOP dependant systemic factors (systemic hypertension, low diastolic perfusion pressures [diastolic blood pressure minus IOP], diabetes, hyperlipidemia, vasospasm) which may contribute to the development and worsening of glaucomatous optic neuropathy.

**Presentation on** - *"Glaucoma Screening Program: Indian Public Health Perspective"*
**Speaker** **-** Dr. Kathirvel

## Glaucoma-"Silent Thief of Sight" in India

- Prevalence of Blindness in India (NPCB, 2006-07): 1%; 33% of global contribution by India
- 12 million cases→ >50% are undiagnosed
- Primary Open Angle Glaucoma: 6.48 millions
- Primary Angle Closure Glaucoma and Disease: 2.54 million and 27.6 million respectively
- Projected to be 16 million by 2020

## Screening: Definition & Criteria

"The presumptive identification of unrecognized disease or defect by the application of tests, exams or other procedures which can be applied rapidly to sort out apparently well persons who probably have a disease from those who probably do not".

## Disease

- Disease should be an important public health problem
- Presence of recognizable latent or early stage
- Appropriate, acceptable and reasonably accurate screening test
- Early detection and treatment can affect the course of disease
- The cost of case finding must be economically balanced.

## Validity of a Screening Test (Accuracy)

Sensitivity: Is the test detecting true cases of disease?
Specificity: Is the test excluding those without disease?
High Risk/Selective Screening
Age > 40 years/Family history /Myopia/DM/Thyroid/Hypertension/ Use of steroids

**Single/Multiphase Screening**
Parallel screening tests:
All tests administered at same time and persons positive on any one test will be considered positive
Increases sensitivity and decreases specificity

**Series screening tests**
Tests administered sequentially, second test to those tested positive on earlier test
Increases specificity and decreases sensitivity

**Screening Tests-Glaucoma**
Suggested sensitivity of 85% and specificity of 95-98% for moderate to severe glaucoma to prevent blindness (USPSTF,2013)

**POAG:**
- IOP assessment: Schiotz, Goldmann Applanation and non contact Tonometry
- Visual field assessment: Conventional & Frequency Doubling Perimetry
- Disc and Nerve Fiber layer examination: Slit lamp exam
- Tonometry
- Accuracy and reliability depends on choice of device, the experience of the examiner, and physiologic variables in the patient
- At IOP >21mmhg:-
- Sensitivity: 47.1% & Speicificity:92.4%
- But >50% of Glaucoma patients had less than 22 mmHg in single reading
- Not all patient with increased IOP developed Optic Nerve damage later

Perimetry
Standard Automated Perimetry:
Sensitivity: 73% & Specificity: 64%
Time consuming and laborious

Frequency Doubling Perimetry (in India):
Sensitivity: 72% (11%) & Specificity: 60% (87%)
Rapid, less expensive and accurate

Disc and Nerve Fiber Layer Examination
At cup-to-disc ratio of 0.55:- Sensitivity: 59% & Specificity:73%

Inter-observer agreement of disc examination by clinical methods or fundus photographs is low

Various combinations of disc parameters, IOP, and family history had only moderate sensitivity (49-66%) and specificity (79-87%)

Optic Disc Photography (74/82), Heidelberg Retinal Tomography (93/85) & Scanning Laser Polarimetry

**PACG**

- POAG screening tests also detects PACG functional damage
- Not useful in case of absence of functional damage and to detect abnormalities in the angle.
- Gonioscopy: Laborious and need clinical expertise
- Anterior Chamber Depth:
- Optical Pachymetry (85% & 84%), Slit lamp mounted and Handheld USG
- Flashlight (Obsolete)and Van Herrick test (61.9% & 89.3%)
- Population based Glaucoma Screening
- Problems with False Positives
- Problems with False Negatives
- Poor infrastructure, instrumentation, time, availability of expertise for diagnosis and treatment

**Recommendation:**

- No test or group of tests was clearly superior for glaucoma screening
- USPSTF Recommendation (July 2013): I statement
- Current evidence is insufficient to assess the balance of benefits and harms of screening for PAOG in adults

**Case Detection-Opportunistic Screening**

- High risk individuals- High PPV in clinical setting than in population setting
- Recommendation: Any person above 35 years should undergo comprehensive examination
- Tonometry (Applanation); Dilated evaluation of Optic Disc: Slit lamp/Fundus photography
- Slit lamp biomicroscopy & Van-Herick test
- Gonioscopy (Indentation)
- Visual field examination (Automated/Goldmann)

**NPCB and Vision 2020- India**

- Glaucoma is one of the target disease but the focus is still on Cataract and its management
- No clear cut strategies towards Glaucoma Management due to various constraints
- GOI-Opportunistic screening model for > 40 years population attending the eye OPD
- Ophthalmologist to population ratio
- 1:25000 in urban area
- 1:250000 in rural area

**Glaucoma Screening: Challenges/Limitations**

- Over-emphasis on IOP measurements
- Lack of routine comprehensive Oph. examination
- Lack the necessary equipment and expertise
- Poor availability of Valid and Reliable tools/tests
- Highly sensitive and specific tools poorly detects early Glaucoma
- Non availability of cost effective screening strategy
- Lack of awareness in the community

**Until more valid and reliable screening methods are developed**

- Target high risk population
- Increase the number of experts
- Provision of advanced equipments/technology
- Provide comprehensive Oph. examination in routine practice
- Educate the community about glaucoma and the need for periodic examination

**Presentation on** - *"Ocular Complications in Glaucoma and outline Management"*
**Speaker** **-** Dr. Harsh Kumar

## Complications of glaucoma

- Decreased vision
- Loss of vision
- Cosmetic blemish in advanced cases
- Secondary cataract formation

Related to glaucoma therapy
Ocular surface problems

## Low Vision

- Low vision aid clinics
- Govt initiative train optoms for LVA
- Provide hand/ stand magnifiers/ knowledge to use gadgets
- Training to use central or residual fields to carry out daily tasks

## Constricting fields

- One eyed injury chances 20% more
- Chances of injury while on stairs
- Should use neck to focus

## Complications related to therapy

- Medical
- Lasers
- Surgical

## Complications of medical therapy

- Social
- Carrying medications ( some require refrigeration)
- Putting drops at work place- getting unnecessary and unwanted attention
- Mental agony of suffering from a disease

## Remedial measures

- Doctor to spend time to educate patient so myths about all getting blind removed
- Fear factor to be tackled
- Trained councilors to provide pschychological support
- Complications of medical therapy

## Financial

- Most drugs costly
- Lifelong expenditure
- Most have to use multiple medications

## Financial- remedial

- Reimbursements and free medications available to all Govt/ PSU and good companies

- What about the poor
- HAVE DRUG BANKS FOR NEEDY
- all rich pharmaceuticals can donate
- Govt can give a share
- All chronic patients can register – certified by govt institutions

**Preservatives in drug**

- BAK- conj/corneal epithelial health/ OSD
- INCORPORATE DRY EYE WORK UP
- Sofzea/ ionic buffer systems
- Polyquad
- unims

**Drug covers writing**

- Very minute writing
- No bold captions prohibited by law
- One side of carton/bottle
- Insert
- Bold letters major problems patient should watch out for
- Major contraindications in simple language
- Detailed pharmacy in small letters

**Drug availability**

- Pilocarpine
- Poor man's drug
- Was off market
- Still scarce

Brimonidine: side effects of drowsiness

**Trusopt/ dorzolamide**

Bd/tid dose
As effective as timolol
Usually as add on
Avoid in sulfa allergy
Avoid in corneal decomposition
Put after other drops

**Pg analouges**

$PGF_2$ $\alpha$ analogue
Alternative Pathway /uveoscleral outflow
OD dosage
IOP lowering may be better then rest (10% - does not work)
IOP below EVP (LTG)
Travoprost without
preservative bak
Xovatra
Travatan
Tafluprost – a new generation prostanoid FP receptor agonist
-increases blood flow at ONH
-fewer corneal and conj side effects
Protective effect on glutamate induced cytotoxicity
Mild Hyperemia

**Problems**

- Periocular pigmentation
- Eyelid growth

- Wiping the Lumigan  decreases pigmentation

**Complications of PI**

- Bleed on gonioscope looks dangerous but is rarely so
- Press gonioscope and most bleeds stop by themselves
- Bleed- compromised eye
- One eyed advanced disc damage
- Check for anticoagulant use

One eyed PI
Check for use of blood thinner
Stop well in time
↑IOP after YAG PI
Max peak 4 hrs.
Need 24 hrs for close watch

**Complications related to surgery**

- Why surgery still a taboo
- Patient scared  doctor scared
- Tight flap trab
- Releasable sutures
- Minimal rate of infection
- Very low chances of wipe out
- When?

No one wants Surgery
Never force; Only if Obvious progression

Problems
Shallow A/C – High IOP
Pupillary Block – Iris Bombe
Malignant – Flat AC
Malignant Glaucoma
Atropine ointment
YAG Hyaloidotomy (Aphake, Pseudophake)
Surgery: (Lensectomy Vitrectomy)

Seidels –ve
Bleb High (Overfilteration)
Dilate pupils
Pressure patch (waking time)
Shallow A/C persistent
Peripheral touch begins
PAS formation
Central touch
Reform AC
Leaking while reforming
Repair Scleral flap
Shallow A/C Flat Bleb Low IOP
? Choroidal detachment USG/indirect
Oral/topical steroids
Cycloplegics

Ciliochoroidal Detachment
Chronic
Recurrent
Inflammatory
Post mito bleb

Ischemic
Thin
Scary-blebitis/ sweat/hypotony/rupture

Post hypotony
Choroids
Hypotonic maculopathy
Infection

Remedial
Must carry antibiotics
Use at hint of conjunctival infection
Not to take lightly
Recalcitrant glaucoma

Glaucoma valve
Tube extrusion 2-3%
Tube migration 1-2%
Touching iris 10-12%
Agv tube Touching cornea
Corneal edema; corneal decomposition
Encystment- failure 10%-20%
Choroidal detachment

In peripheral areas
There may be a role of diode in seeing eyes Vs trab by poorly trained docs

**Discussion**

DS: Maybe we could use the FDT for screening and then take up for perimetry

RS: I think we should look at what can we do in the PHC. What to train? Whom to train? What do we have now?

PV: The ASHA worker is the peripheral health contact with the community. In a survey we found only 13% of ASHA workers had heard about glaucoma. And only 2% knew anything about the disease. What is the bare minimum that should be available in the PHC for screening for glaucoma?

RS: At least a Snellens chart

HK: Logistics of Snellens chart. Lighting. Distance etc., because a lot with so called low vision in peripheral areas turn out to be normal when brought to the hospital.

RS: OK so what is the minimum that we can do

DS: Maybe a torchlight examination of the anterior segment? Visual acuity certainly.

RS: That would be enough to detect an eye problem

MD: We must remember that preventing blindness should be paramount.

PV: 90% detection is only possible in the CHC. At the PHC level we must concentrate on creating awareness in the community to come for an eye check-up, and to be able to refer any patient with an eye problem.

HK: Detecting RAPD at the PHC level with a torch would itself be a good start.

PV: Some PHCs are upgraded to Vision Centers. They would have a Snellens Chart and Optometrist also.

RS: What is a PHC and what is a Vision Centre

PV: For every 1000 population, there is an ASHA worker, and male and female multipurpose health worker. For every 30,000 population, there is a PHC. Some PHCs have an ophthalmic assistant and are designated Vision Centers. A CHC caters to 1.00.000 population. It has 4-5 specialists. But ophthalmology is not part of a CHC specialist program. One paramedic ophthalmic assistant (PMOA) has 2 years Diploma course in Optometry or trained as a Ophthalmic Assistant in any of the recognized Government Hospital as per guidelines of NPCB. More PMOAs are required. There is also a move to include 2 year training as optician in CBSE vocational courses for optometry and dispensing.

RS: Is there an incentive to detect glaucoma?

PV: In the 12$^{th}$ 5year plan there is an incentive of Rs 1000 for any NGO detecting and managing glaucoma

RS: But this fact is not known. It's important that people should know this

PV: Rs 1500 is the incentive for laser or surgery for glaucoma. The NGO must be registered with the NPCB. And there must have been no charge from patients.

MM: Can we increase seats in the Schools of optometry to make up the shortfall of optometrists?

PV: Yes we have involved the optometry association of India. At present there are 15000 optometrists in the country.

RS: IGNOU has a large programme of optometry. We could use that to increase manpower.

PV: NPCB requirements for reporting eye care are number of cataract surgeries done; number of eyes collected and number of spectacles prescribed to school children. There are no indicators as yet to report glaucoma or diabetic retinopathy. However in the Health Management Information System (HMIS) of the NPCB, glaucoma does figure. Still of 65 lakh surgeries performed in a year, only 5 lakhs were reported in the HMIS.

RS: OK. Now let's discuss what it that we would like done in an eye camp is. What is done now? Dr Seal?

AS: In a comprehensive eye camp there are average 300 patients.1 paramedic does torch light examination for pupil/ AC depth and direct ophthalmoscopy. Any abnormality is reported to the doctor. All > 40 years have dilated examination and IOP- Schiotz/ Perkins. Any patient for cataract has syringing, Schiotz tonometry, BP recording. Fundus examination is by indirect ophthlamoscopy- its quicker and easier and found helpful to suspect glaucoma.

Accordingly the patients are referred to a glaucoma specialist in the hospital where further management is decided. A portable slit lamp helps a lot in the camp.

**Session 3: Other initiatives, Govt, NGO nad International NGO support**

**Presentation on** - *"Early detection of glaucoma: Challenges"*
**Speaker** **-** Brig. JKS Parihar

## GLAUCOMA

- The second leading cause of blindness worldwide
- Typically a slow-progressing,asymptomatic optic neuropathy which causes irrever sibldamage
- Prevalence increases with age;
  Diagnosis is based on identification of typical structural & functional evidence of d amage
- Only mode of treatment is prevention of further damage
- Indian population has over 2% incidence of glaucoma
- Mostly asymptomatic
- >50% undetected
- 60% of the eyes that developed glaucomatous
  VF defects had structural defects up to 6 years prior to the functional loss
- We had missed many: Disheartening and added to the feeling of guilt.

## Where do we stand

- We have treatment "FOR" glaucoma
- We do not have treatment "OF" glaucoma
- This needed an immediate intervention: Identified the limitations.

## CHALLENGES

### SCREENING

World Glaucoma Association consensus statement
*"…safe, easy to administer and interpret,*
*portable, quick, acceptable to the people who are tested, able to obtain results in the majority of tested individuals and sufficiently valid to distinguish between those who do and those who do not have OAG"*

*Screening*
What device? What parameter? Cost effectiveness?

*Early detection*
What device? By whom at grass root level
How to identify structural changes that predict future functional damage?

### How dependent is glaucoma detection on these?

Most important screening tests are:
IOP: for over a century
Optic Nerve head analysis
Visual fields
Though today's science is way beyond this--but doing this much can save several eyes (as it did for centuries).

## PROGRESSION DETECTION CHALLENGES

- Defining progression in the absence of independent criteria
- What is the minimal number of tests required to confirm progression?
- How often should a patient be examined?
- Event or trend analysis?
- How many confirmatory tests are needed?

## VISUAL FIELD -LIMITATIONS

- No clear criteria for glaucoma progression;  Short and long term fluctuations
- Highly dependent on baseline
- Large number of tests are needed to confirm progression event

## SCHIOTZ TONOMETER

- No SLIT LAMP required; Avoids requirement of large space
- Easy sterilization; Needs only topical anesthetic
- Accurate; Compact and portable; Low cost

## Categories encouraged for tonometry:

- Age above 40years
- Diabetics /Hypertensive
- Hypermetropes
- Family history of glaucoma or Diabetes
- Patients of Spring catarrhal/ asthma
- H/o previous eye injury/ disease or surgery

    Cataract / Iritis
    Relevant drugs being taken (systemic/topical).

Peripheral anterior chamber depth: Eclipse test

*Eclipse Test:*
Shadow of iris eclipses/ does not eclipse  the other side .

Van Herick's Grading under S/L:

- Corneal thickness: periph. AC ratio (60° illum. Angle)
- Fletcher in his book says: " The Van Hericks grading of peripheral AC depth is so accurate that I did not  feel the need to learn the skills of gonioscopy"

Community level
(vision guardian)
Creating general awareness
Refer, refract and refer

Primary care
(vision technician)

- History
- Measurement of iop
- Depth of anterior chamber
- Optic nerve analysis
- Referrals

Secondary care
(ophthalmologist)

- History
- Applantion tonometry
- Gonioscopy
- Optic nerve head analysis and documentation
- Perimetry
- Medical and surgical treatment
- Data compilation

Tertiary care
(subspecialties)
Diagnosis and management of complex cases of glaucoma
Training

Advanced tertiary care
(Team of subspecialists)

- Training of subspecialty
- Research
- Curriculum standards
- Capacity building of subcentres
- Modification of infrastructure
- Procurement & distribution of equipments allocation of funds
- Data analysis, monitoring, reports and evaluation

Proposed training activities

- General Training in IOP , REFRACTION , PERIMETRY GLAUCOMA CARE (2months)
- Low Vision Services – 1 week Training.
- The trainees will be posted to Low Vision units of training institutions.
- Handling of various instruments / L.V Aids and Management of patients.

Summary of an Approach to Glaucoma in a Blindness Prevention Programme

- For a population of one million people, there are an estimated 2,000 people with moderate, detectable, and treatable glaucoma.
- Case finding at the primary level can be undertaken by:
    - Stress on evaluation of the visual acuity & AC depth among target groups
    - Screening of All people > 40 years irrespective of target
    - Reduced visual acuity + 'black blindness' (glaucoma); refer to secondary level.

Summary of an Approach to Glaucoma in a Blindness Prevention Programme

- Case finding at the primary level can be undertaken by:

Tonometry & disc analysis
Cases should be categorized as 'normal', 'suspect case', and 'diagnosed case' according to the intraocular pressure (< 28mmhg, or 28mmhg) and the vertical cup: disc ratio (<0.6, or 0.6)
'Suspect cases' and 'diagnosed cases' should be referred to the tertiary level.

DEVELOPMENT OF INFRASTRUCTURE

- Strengthening of PHCs

- Central mobile units
- Strengthening of Dist hosp
- Upgrading of Dpts of Ophthalmology in Med clgs
- Establishment of regional institutes
- Setting up of 5 centres of excellence for eye care services
- Dist mobile units
- State ophthalmic cell
- Ophthalmic asst training centres
- Paramedical ophthalmic assistants posted
- Telemedicine in ophthalmology
- Involvement of private practitioners

**Presentation on** - *"Current and Future Initiatives by the Glaucoma Society of India"*
**Speaker** **-** Dr. Sushmita Kaushik

- Glaucoma Society of India was established in 1990 with the aim of
- Disseminating current practice patterns in glaucoma management
- Help ophthalmologists in different parts of India to upgrade their skills to promote excellence in patent care and help preserve their vision related quality of life.
- Member Society of the World Glaucoma Association (WGA)
- Currently 793 ratified members from all over the country.

**Member benefits:**

- Automatic member of the World Glaucoma Association since the GSI is a member society.
- Receive International Glaucoma Review as a member
- Part of GSINET- email group of the GSI
- Reduced registration fees at the Annual Conference
- Glaucoma Society of India Website glaucomaindia.com
- Annual Conferences of GSI
- Very well attended.
- Scientific deliberations keeping in mind day-to-day care of glaucoma patients in common everyday clinical scenarios.

**Glaucoma India Education Programmes (GIEP)**

Objectives:

- To organize nationwide glaucoma courses designed and executed by The Glaucoma Society of India
- To spread basic as well as updated knowledge of glaucoma diagnosis and management.

Target audience: All ophthalmologists

- Private practitioners
- Ophthalmologists in Private or Government Teaching Institutions
- All residents/postgraduates.

GSI Support

- Rs 30,000 per CME; 3 per zone per year; 15 in all

Organization of the GIEP

- 5 ZONES
- Each zone has a GIEP co-ordinator from GSI
- Speaker/panelists (1-2) from the nearest city
- Regular/recognized GSI faculty

- Program primarily comprises glaucoma basics/management
- Wide publicity in local ophthalmic newsletters etc

**8 CMEs so far this year- Supported in part GSI**

- South- Dr George Puthuran: Erode, Kollam, Puttaparthy
- West- Dr Mariam; Dr Mayuri: Bhavnagar, Anand, Navasari
- East- Dr Dipanjan Pal: Jorhat, Siliguri.

**GSI-Net**

- Unique Google mailing group
- Open to all GSI members
- Easy portal to share clinical notes, problems, and discussion.

**GSI Facebook Page**

- Managed by GSI
- Very useful to post events, activities etc for instant dissemination

**GSI Guidelines Primer**

- Distributed freely all over India to all ophthalmologists
- Specially targeted residents in training.
- Salient features for diagnosis and treatment of glaucoma
- Complied by the GSI- authored by eminent glaucoma specialists in the country.

**Activities**

- World Glaucoma Week
  GSI WALK- 10TH March 2013; 36 cities
  Across the country ;Celebrities endorsed in many places
  Extensive Media Coverage
- GSI Public Awareness programmes
- GSI Street Plays and eye camps
- GSI Radio awareness programmes
- Recognition of WGW importance
  Included in the activities of the NPCB.

**GSI on the World Stage**

- GSI at the World Glaucoma Congress Vancouver July 17-20, 2013
- India: Largest number of accepted abstracts
- 3rd largest number of delegates
- 2ND Runner-up in the WGC Film Festival
- 3 of 5 Clinical Challenges selected for discussion
- GSI Symposium- captured on video for WGA educational website
- GSI Symposium
- 2ND RUNNER-UP at the Film FESTIVAL :George Puthuran; AADI GDD.

**Future Directions….**

- Continue our efforts to disseminate knowledge about optimum management strategies for glaucoma
- Set up effective patient support groups
- Increase public awareness about the disease to encourage them to come forward for screening.

- Give support to all doctors dealing with glaucoma to lessen the burden of care on tertiary care referral institutes.

**Presentation on** - *"PGIMER's Efforts in Glaucoma Initiatives in Northern India- Way Forward"*
**Speaker** **-** Prof. SS Pandav

- GIMER serves a large area and population
- It covers approx. 14,21,38,450* population.
- 11.76% population of the country.
  *Census of India 2011

**Facilities / Expertise**

Clinical Skills
Visual fields
Stereo Disc Pictures
OCT
HRT

**Problem**

90% of the cases still undiagnosed

**Solution?**

Awareness
Public Education Campaigns
Television
FM Radio
Print media
Public lectures
Patient awareness program

- Attendance in the clinics increases after awareness programs
- Are we ready to deal with increased number of aware people?
- How many glaucoma specialists for 142 million people?
- Dwindling Manpower

**Our Strategy**

- Glaucoma support group
- Increase Awareness
- Emotional/ social/ financial support

**Glaucoma care group**

- Increase pool of glaucoma doctors
- Paramedical professionals

**Why we do it?**

- Glaucoma is grossly undiagnosed condition
- 12 million affected with glaucoma
- 10-11 million not diagnosed
- If not treated majority of them will lose vision.
- If treated in time - 90% saved

**Reasons for the large undiagnosed glaucoma pool**

- Lack of awareness
- Lack of trained manpower

- Limited access to health care

**Glaucoma Care Group**

- To create glaucoma doctors network so that interested doctors can work together.
- To provide opportunities for doctors to update themselves and spread glaucoma related knowledge among themselves.
- To create a forum where doctors can help each other in managing complicated cases.
- To create a referral system and feedback mechanism so that patient s can move easily between practices.
- To support other organizations, such as patient support groups, committed to reduce blindness due to glaucoma.

**Discussion**

HK : That is nice, I think that is a good way to start.

SSP: We are increasing glaucoma awareness through support group and providing mechanism to handle 'aware people' through glaucoma care network which is a body of eye doctors interested in glaucoma care.

MD: We also need to talk of infrastructure development in the country.

SSP: Public asking for a service will matter ultimately. The driving force for any Govt spending is the consumer. Increasing awareness and creating consumer groups will help.

PV: Infrastructure development will be required at all levels.

MD: For that we must create awareness among the public for them to demand a service.

**Presentation on** - *"Situational Analysis of Glaucoma in India"*
**Speaker** **-** Dr. Praveen Vashist

**Definition of Glaucoma in the country**

**Glaucoma: Global Magnitude**

- Blindness due to glaucoma: 8%
- 3.2 million blind due to glaucoma
- Second most common cause of blindness
- Most common cause of irreversible blindness

- Proportion of Blindness
  POAG and PACG
- Global Magnitude 2010
- Glaucoma not included among the priority diseases under Vision 2020- Right to Sight

**Glaucoma Prevalence in India-Concern :**

- In India >90% of people with POAG remain undiagnosed
- 98.6% Chennai Glaucoma Study
- 93 % ACED study

| | | |
|---|---|---|
| Population 40+ (25%) | 250,000 | |
| Glaucoma Prevalence (1-4%) | 2,500 – 10,000 | |
| Blind from Glaucoma (10% of cases) | 250 - 1000 | VA screening with cataract case finding |
| Moderate Glaucoma (40% of cases) | 1000 - 4000 | Case detection with presbyopia-Cupping, ?IOP |
| Early Glaucoma (50% of cases) | 1250 - 5000 | Clinical cases |

**Situational analysis of Glaucoma in RIOs**

| S.No | RIO Name | No. of Glaucoma specialists |
|---|---|---|
| 1 | RIO, Punjab | **2** |
| 2 | RIO, Rohtak | **4** |
| 3 | R. P. Centre (RIO Delhi) | **3** |
| 4 | RIO Jaipur | **0** |
| 5 | ROI, UP Sitapur | **4** |
| 6 | RIO, Allahabad | **2** |
| 7 | RIO Patna | **1** |
| 8 | RIO Guwahati | **3** |
| 9 | RIO Ranchi | **na** |
| 10 | RIO – Kolkata | **5** |
| 11 | RIO- Ahmedabad | **4** |
| 12 | RIO Bhopal | **-** |
| 13 | RIO Raipur | **1** |
| 14 | RIO Cuttack | **2** |
| 15 | RIO, Mumbai | **4** |

| | | |
|---|---|---|
| 16 | RIO – Hyderabad | **2** |
| 17 | RIO Bangalore, Karnataka | **5** |
| 18 | RIO, Chennai | **na** |
| 19 | RIO Trivandrum | **3** |

**RIO Guidelines**
**(submitted to NPCB)**

| Equipment | Services |
|---|---|
| • Gonioscope (Goldmann)<br>• Non contact tonometer<br>• Applanation tonometer<br>• Pachymeter<br>• Perkins tonometer/Tonopen<br>• Standard Automated perimeter<br>• Heidelberg Retinal Tomography<br>• Fundus camera<br>• OCT | • Trabeculectomy<br>• Nd YAG Peripheral iridotomy<br>• Trabeculotomy<br>• Trabeculoplasty<br>• Cyclophotocoagulation<br>• Glaucoma valve implantation |

**GLAUCOMA EQUIPMENT Available at RIOs**

| S.No | RIO Name | Tonometer | Automated Perimetry | Fundus Camera |
|---|---|---|---|---|
| 1 | RIO, Punjab | Yes | yes | yes |
| 2 | RIO, Rohtak | Yes | yes | yes |
| 3 | R. P. Centre (RIO Delhi) | Yes | yes | yes |
| 4 | RIO Jaipur | Yes | yes | yes |
| 5 | ROI, UP Sitapur | Yes | yes | yes |
| 6 | RIO, Allahabad | Yes | yes | yes |
| 7 | RIO Patna | Yes | yes | yes |
| 8 | RIO Guwahati | Yes | yes | yes |
| 9 | RIO Ranchi | Yes | yes | yes |
| 10 | RIO – Kolkata | Yes | yes | yes |

| | | | | |
|---|---|---|---|---|
| 11 | RIO- Ahmedabad | Yes | yes | yes |
| 12 | RIO Bhopal | - | - | - |
| 13 | RIO Raipur | yes | yes | yes |
| 14 | RIO Cuttack | yes | yes | yes |
| 15 | RIO, Mumbai | yes | yes | yes |
| 16 | RIO – Hyderabad | yes | yes | na |
| 17 | RIO Bangalore, Karnataka | yes | yes | yes |
| 18 | RIO, Chennai | yes | yes | yes |
| 19 | RIO Trivandrum | yes | yes | yes |

| S.No | RIO Name | Automated perimeter | Retinal Tomography | GDx Nerve Fiber layer analyzer | Fundus camera | Ultrasonic biomicroscopy (UBM) |
|---|---|---|---|---|---|---|
| 1 | RIO, Punjab | yes | no | no | yes | yes |
| 2 | RIO, Rohtak | yes | no | no | yes | no |
| 3 | R. P. Centre (RIO Delhi) | yes | yes | yes | yes | yes |
| 4 | RIO Jaipur | yes | na | na | yes | na |
| 5 | ROI, UP Sitapur | yes | no | no | yes | yes |
| 6 | RIO, Allahabad | yes | no | no | yes | yes |
| 7 | RIO Patna | yes | no | no | yes | yes |
| 8 | RIO Guwahati | yes | no | no | yes | no |
| 9 | RIO Ranchi | yes | no | no | yes | no |
| 10 | RIO – Kolkata | yes | yes | yes | yes | no |
| 11 | RIO-Ahmedabad | yes | yes | yes | yes | yes |
| 12 | RIO Bhopal | - | - | - | - | - |
| 13 | RIO Raipur | yes | no | no | yes | no |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | RIO Cuttack | yes | no | no | yes | no |
| 15 | RIO, Mumbai | yes | no | no | yes | yes |
| 16 | RIO – Hyderabad | yes | No | no | no | no |
| 17 | RIO Bangalore, Karnataka | yes | No | no | no | yes |
| 18 | RIO, Chennai | yes | Yes | no | no | yes |
| 19 | RIO Trivandrum | yes | Yes | no | yes | yes |

| S.No | RIO Name | Gonioscope (Goldman) | Non contact tonometer | Applanation tonometer | Perkins tonometer | Goldman perimeter |
|---|---|---|---|---|---|---|
| 1 | RIO, Punjab | yes | Yes | yes | no | yes |
| 2 | RIO, Rohtak | yes | No | yes | yes | no |
| 3 | R. P. Centre (RIO Delhi) | yes | Yes | yes | yes | yes |
| 4 | RIO Jaipur | yes | Yes | yes | yes | na |
| 5 | ROI, UP Sitapur | yes | Yes | yes | yes | no |
| 6 | RIO, Allahabad | yes | Yes | yes | yes | yes |
| 7 | RIO Patna | yes | Yes | yes | yes | no |
| 8 | RIO Guwahati | yes | Yes | yes | no | no |
| 9 | RIO Ranchi | yes | No | yes | no | no |
| 10 | RIO – Kolkata | yes | Yes | yes | yes | yes |
| 11 | RIO-Ahmedabad | yes | Yes | yes | yes | yes |
| 12 | RIO Bhopal | - | - | - | - | - |
| 13 | RIO Raipur | yes | Yes | yes | yes | no |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14 | RIO Cuttack | yes | No | yes | no | na |
| 15 | RIO, Mumbai | yes | Yes | yes | yes | yes |
| 16 | RIO – Hyderabad | yes | no | yes | yes | no |
| 17 | RIO Bangalore, Karnataka | yes | yes | yes | yes | yes |
| 18 | RIO, Chennai | yes | yes | yes | yes | no |
| 19 | RIO Trivandrum | yes | yes | yes | no | yes |

## GLAUCOMA SERVICES AT RIOs

| S. No | RIO Name | Trabeculectomy | Nd YAG Peripheral iridotomy | Trabeculotomy | Cryophotocoagulation |
|---|---|---|---|---|---|
| 1 | RIO, Punjab | yes | yes | yes | no |
| 2 | RIO, Rohtak | yes | yes | yes | yes |
| 3 | R. P. Centre (RIO Delhi) | yes | yes | yes | yes |
| 4 | RIO Jaipur | yes | yes | yes | yes |
| 5 | ROI, UP Sitapur | yes | yes | yes | yes |
| 6 | RIO, Allahabad | yes | yes | yes | yes |
| 7 | RIO Patna | yes | yes | yes | yes |
| 8 | RIO Guwahati | yes | yes | yes | no |
| 9 | RIO Ranchi | yes | yes | no | yes |
| 10 | RIO – Kolkata | yes | yes | no | yes |

| | | | | | |
|---|---|---|---|---|---|
| 11 | RIO-Ahmedabad | - | - | - | - |
| 12 | RIO Bhopal | yes | yes | yes | no |
| 13 | RIO Raipur | yes | yes | yes | yes |
| 14 | RIO Cuttack | na | na | na | na |
| 15 | RIO, Mumbai | yes | yes | yes | yes |
| 16 | RIO – Hyderabad | yes | yes | yes | na |
| 17 | RIO Bangalore, Karnataka | yes | yes | no | yes |
| 18 | RIO, Chennai | yes | yes | yes | yes |
| 19 | RIO Trivandrum | yes | yes | yes | yes |

**GLAUCOMA OUTPUTS**

| S.No | RIO Name | No Of patients Screened OPD | No of cases Medication | No of Cases Laser T/T | Surgery | No. of referred cases treated | No. of cases which were further referred |
|---|---|---|---|---|---|---|---|
| 1 | RIO, Punjab | 1712 | 1576 | 169 | 36 | 78 | 0 |
| 2 | RIO, Rohtak | na | Na | na | na | na | na |
| 3 | R. P. Centre (RIO Delhi) | 8868 | Na | 1400 | 701 | na | na |
| 4 | RIO Jaipur | na | Na | na | na | na | na |
| 5 | ROI, UP Sitapur | 8000 | 4638 | na | 263 | na | na |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | RIO, Allahabad | 1384 | 1343 | 128 | 83 | 257 | 87 |
| 7 | RIO Patna | na | Na | na | na | na | na |
| 8 | RIO Guwahati | 178 | 153 | na | 25 | na | na |
| 9 | RIO Ranchi | na | na | na | na | na | na |
| 10 | RIO – Kolkata | 5728 | na | na | 68 | na | na |
| 11 | RIO-Ahmedabad | 2219 | 1220 | 543 | 254 | 102 | na |
| 12 | RIO Bhopal | - | - | - | - | - | - |
| 13 | RIO Raipur | 459 | 120 | 26 | 36 | 53 | 12 |
| 14 | RIO Cuttack | na | na | na | na | na | na |
| 15 | RIO, Mumbai | na | na | na | na | na | na |
| 16 | RIO – Hyderabad | 6552 | na | na | 360 | na | na |
| 17 | RIO Bangalore, Karnataka | na | na | na | na | na | na |
| 18 | RIO, Chennai | 1478 | 4994 | 298 | 160 | 54 | na |
| 19 | RIO Trivandrum | 6620 | 5534 | 314 | 152 | na | 0 |

## GLAUCOMA SERVICES AT RIOs

| S.No | RIO Name | Patients seen in Glaucoma specialty OPD | Glaucoma surgeries performed |
|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | RIO, Punjab | 1976 | 152 |
| 2 | RIO, Rohtak | 1261 | 311 |
| 3 | R. P. Centre (RIO Delhi) | 8868 | 701 |
| 4 | RIO Jaipur | na | na |
| 5 | ROI, UP Sitapur | 8600 | 263 |
| 6 | RIO, Allahabad | 1264 | 91 |
| 7 | RIO Patna | 1500 | 46 |
| 8 | RIO Guwahati | 48 | 25 |
| 9 | RIO Ranchi | na | na |
| 10 | RIO – Kolkata | 4644 | 77 |
| 11 | RIO- Ahmedabad | 10273 | 275 |
| 12 | RIO Bhopal | - | - |
| 13 | RIO Raipur | 561 | 73 |
| 14 | RIO Cuttack | na | na |
| 15 | RIO, Mumbai | 2357 | 118 |
| 16 | RIO – Hyderabad | 9000 | 200 |
| 17 | RIO Bangalore, Karnataka | 4194 | 110 |
| 18 | RIO, Chennai | na | na |
| 19 | RIO Trivandrum | 6620 | 168 |

**Recommendation**

- Need for National plan of action for glaucoma – guidelines at Primary, secondary and tertiary level
- NPCB initiative for Glaucoma service support at all levels
- Specific monitoring indicators – as part of MIS

**Discussion**

MD: This is an eye-opener. We have a long long way to go

RS: I think we really need a resource mapping so that places with no services can refer to appropriate place.

**Presentation on** - *"Success Story on Glaucoma Management"*
**Speaker** **-** Dr. Devendra Sood

**Better training**

- There is better training available.
- Residents are opting for glaucoma fellowships
- Many institutions have separate entrance exams for a glaucoma fellowship.

More doctors interested in glaucoma training means more patients get speciality care

In the eye check up as part of the whole body check up the SOPs include IOP measurement and optic disc evaluation

**Group Work-1:- Situational Analysis, Need, Challenges**
**Group-1 (HR & Training)**

| | | **Current status** | **Need** | **Challenges** |
|---|---|---|---|---|
| **Primary level** | Human resource | ASHA(awareness ),<br>HW male female,<br>MO<br>GPs, PMOAs | ASHA Per 1000, ANM per 5000,<br>PMOAs per | Overburdened<br>Lack and untrained PMOA<br>Non involvement of Private practitioner |
| | Training need | Awareness generation<br>Opportunistic screening<br>Compliance and followup<br>People with risk factors should be screened | More training<br>Training in PEC (Glaucoma is a part)<br>Screening by schiotz tonometry 40+people | Non availability<br>Willingness to use<br>No priority<br>Other activities |
| **Secondary level** | Human resource | Oph'logist (1-3_ PMOA<br>One nurse (MICROSCOPE-OT) | Applanation tonometer/ Perkins handheld/Gonioscope /yag laser | Priority for cataract<br>Non operating surgeons<br>Managerial activities<br><br>Lack of PMOAs to support O'gist |
| | Training need | Schiotz<br>SLE gonio not properly utilized | Training (at least 2 months hands on)<br>Refreshers training<br>CMEs (preferably every year)<br>Short training course on glaucoma evaluation<br>NGO support SOPs | HR<br>Less training instt and personnel for Glaucoma<br>Quality of training |
| **Tertiary level** | Human resource | Medical college do not have Glaucoma specialist<br>No separate glaucoma clinics | Glaucoma clinic with consultant<br>Support of counselors/PMOAs<br>Strict guidelines enforced<br>Bare minimum | Resources not available<br>Infrastructure/equipments |
| | Training need | Lack of glaucoma specialist | Fellowships (long term (1 year at tertiary level) as well as short term)<br>More glaucoma specialist<br>Hands on training<br>Awareness<br>Prominent personality (Celebrity, religious leaders, actors)<br>SOPs | Attitude towards glaucoma<br><br>Ownership not there |

**Group 2- Infrastructure & Equipment**
**Community screening- comprehensive eye camps**

Portable NCT, Portable non-mydriatic fundus camera, portable slit lamp, FDT mobile vans-26 seater,

| **Primary level** | | **Existing** | **Need** | **Challenges** |
|---|---|---|---|---|
| | Infrastructure | | If PMOA<br>1. Dark Room (10 by 10) | Training;<br>Awareness |
| | Equipment | | 1. Illuminated Snellen's with illiterate, local language, optotypes<br>2. Pin hole<br>3. Torch with adjustable focus<br>4. IEC for glaucoma with emphasis on local needs<br>5. SOP and referral charts for common diseases<br>6. Ophthalmoscope<br>If PMOA<br>1.Refraction unit<br>2. Schiotz tonometer | Maintenance of equipments<br>Development of standard modules,<br>Actual usage,<br>Wear and tear of IEC material |
| **Secondary level** | Infrastructure | | Dark room for perimetry<br>Dedicated Eye OT | Cost<br>Maintenance (AMC) |
| | Equipment | | Slit lamp with applanation, gonioscope-2 or 4 mirror, 78D,90D<br>Pachymeter, NCT,<br>Automated perimeter<br>Ophthalmoscope-direct & indirect,<br>Bipolar cautery,<br>Yag laser , cyclocryotherapy probes and machine,<br>Net access<br>Fundus camera<br>1. Developing the SOPs, for Schiotz modules,<br>2. SOPs and flow chart for diagnosis and management<br>3. Telemedicine facility | Online access to GSI website<br><br>EMR |
| **Tertiary level** | Infrastructure | | Dedicated OT | |
| | Equipment | | As above<br>+<br>Imaging device<br>Low vision devices<br>Diode laser with G probes, trabeculotome, | Cost , maintenance & Utilization |

## Group-3 (Service Delivery)

| Primary level | | Current status | Need | Challenges |
|---|---|---|---|---|
| | Awareness | Negligible awareness specific for glaucoma amongst existing health workers<br>No large scale involvement of media | Case finding, developing positive health seeking behavior,<br>Compliance to treatment<br>Sensitizing health workers to eye health problems<br>Send soft copy of the material to the DBCS to then send to the PHC.<br>Local languages preferable.<br>Involve local religious leaders to spread awareness | Having proper education material<br>Transporting existing materials to users e.g. panchayats |
| | Screening/ Diagnosis | Lack of trained HR & infrastructure | Train people at primary level to examine pupil& VA in order to Screen established Glaucoma<br>Schiotz Tonometer where Optometrist /trained Eye Care person is available.<br>Basic training of optometrist to be able to screen abnormalities in the anterior segment.<br>Any child with photophobia and large eye to be referred to Tertiary level.<br>Logistics to work out partnership with NGOs certified by the DBCS /PPP certified by the DBCS. | It is not a priority<br><br>Incentive for ASHA for cataract is probably disincentive for glaucoma<br><br>Lack of knowledge& sensitivity among Eye Care workers<br><br>Teleophthalmology has limited presence |
| | Treatment | Secondary level | To establish a referral network | |
| **Secondary level** | Awareness | Lack of enough sensitivity to screen and treat glaucoma | Should not only treat glaucoma, should work as an effective referral facility for PHCs. | Availability of HR<br>Too much cataract focused<br>Lack of proper attitude |
| | Screening/ Diagnosis | Limited diagnostic facility (limited to Direct Ophthalmoscope &Schiotz tonometer) | Opportunistic screening<br>Comprehensive<br>Minimum standard should be Applanation tonometry, gonioscopy, optic disc evaluation perimetry | Lack of comprehensive eye examination |
| | Treatment | Medical treatment without adequate training | Laser iridotomy<br>Trabeculectomy<br>To refer any complicated surgical case to tertiary level | Getting trained<br>Willingness to pay attention to Glaucoma |

| | | | | |
|---|---|---|---|---|
| **Tertiary level** | Awareness | Advocacy and advisory to Govt<br>Capacity building<br><br>Need assessment | Opportunistic glaucoma screening for every patient coming for eye check up<br>Comprehensive eye examination<br><br>Need to have more CMEs and training programmes | Practice and train comprehensive eye examination |
| | Screening/ Diagnosis | | More attention to diagnosis and treatment<br><br>Effectively train HR<br>Research | Need to develop leadership<br><br>Need to develop enabling environment<br><br>Patient overload |
| | Treatment | No standard protocol in most of the centres<br><br>Inadequate training facility | Audit the functioning of the secondary centres<br><br>Standardization of training and treatment protocols.<br><br>Develop SOPs | |

**DAY2: Sunday Nov 24th 2013**

## Session 4: Gap Analysis and Strategies

Gap analysis and strategies for control of Glaucoma – (strategies for glaucoma detection and management at PHC to Tertiary level and suggest potential future innovations) and Identify priorities for glaucoma care in India. Generate consensus on priorities for glaucoma care in India and strategies for glaucoma program in India

### Group 1:Glaucoma awareness generation

**Dr. J C Das**
**Dr. Vinay Nangia**
**Dr. Srishti Raj**
**Dr. Priyanka**
**Anurag Dhingra**

**For General ophthalmologists**

- Workshops to share
- Short term observer-ship & fellowship
- Magnitude of problem
- Improving diagnosis skill
- Advantages of managing glaucoma
- When to refer
- Importance of educating the patients

**For Junior ophthalmologists**

- Awareness for PGs with the help of Vision 2020 and with PPP (Pharmaceutical companies)
- Fellowship in Glaucoma
- CMEs & training for PGs by GSI, state and national organizations, institutes etc
- Involving students in screening camps with emphasis on Glaucoma
- Glaucoma Awareness for GP
- General practitioners
- Need to coordinate b/w GP & ECP

**IMA**

- Newsletters
- Lectures/discussion by ophthalmologists – locality wise for
- Systemic diseases &Drugs known to cause Glaucoma
- Joint Screening camps by GP & Ophthalmologists
- Guidelines for when to refer to ophthalmologists

**For Paramedics**

- Basic knowledge about Glaucoma
- Knowledge of magnitude of glaucoma and the challenge of diagnosing glaucoma.
- Diagnostic skill development
- Interpretation of basic diagnostic procedures
- Patient counseling
- Periodic training every two years
- When to refer patient to an ophthalmologists

**For Community & Media**

- Public lectures
- Glaucoma Awareness Week
- Street Plays
- Articles in newspaper- Doctor Interviews

- Pamphlet distribution
- Radio advt- dedicated segment- AIR
- Celebrity endorsement
- Air Record across cities
- TV advt
- Encourage Family screening
- Press conferences
- Approaching local Cable – captions

**For Community & Media- Contd**

- Father's Day- Get your Dad's eye checked
- Newspaper office – Displaying Glaucoma awareness slogan
- Movie Theatre slots
- Hoardings, Posters
- Chemist shop
- Optical shops
- Patient Education booklets
- Internet
- Facebook
- Expanding GSI website
- Patient Education material
- Patient Education Movies

**For Patients**

- Patient Education Booklets
- Family Screening
- Patient counseling
- Patient Support Group
- Guiding patients in finding the right doctor in his area
- Counseling through personal approach/tele-counseling/emails

## GROUP 2: ASSESSING MAGNITUDE OF GLAUCOMA

**Rapid assessment tools**

- Assessment is possible without compromising on the quality and validity
- Rapid assessment with good validity and quality is not feasible
- The fact that glaucoma cannot be diagnosed based on one single test
- Tests required to diagnose need a clinical expertise and time consuming
- Logistical issues like large sample size, etc.
- Hence, the quality of a glaucoma assessment is inversely proportional to the rapidity of the assessment

**Sample size**

- Glaucoma prevalence 2.5% we have estimated a sample size of 8000 subjects in 40 and above age group
- 40 clusters of 200 each

**Sample collected based on compact segment sampling**

- Study
    - Community level – House to House Visit
    - Enumeration
    - Consent
    - Questionnaire, appointment
    - Staff required: 3 people ( 1 field supervisor + 2 HW)

- Glaucoma assessment

  B: at the Center located in the community:
  Divided into stations:

  Registration, History (which has standard questions for all the subjects)- HW1
  Vision and Refraction: PMOA
  IOP- applanation tonometry, SLE, Gonioscopy: Ophthalmologist, with one HW
  Mydriatic fundus- Image Technician
  Back to ophthalmologist for dilated evaluation
  Target: To cover 200 people in one week

**Referrals**

For referred cases at the base hospital:

Automated perimetry- one HW at base hospitals
Subsequent glaucoma management is planned at this level

**Team for Glaucoma Assessment**

Investigator: Glaucoma specialist- hospital with Glaucoma facilities- automated perimetry, treatment facilities

**Field team:**

Ophthalmologists-2, One PMOA, image Technician, one field supervisor, 5 HW, Data entry operator

**Duration for survey: around one year**

- Cost: around 80 lakhs
- Equipment: 20 lakhs (excluding automated perimeter)
- HR: 45 lakhs
- Others: 15 lakhs

## GROUP 3: GLAUCOMA SCREENING METHODS IN THE COMMUNITY/ HOSPITAL; TARGETS: IDENTIFYING GLAUCOMA CASES FROM < 10% TO AT LEAST 50%

**Col Deshpande**
**Dr. Rohan Chariwala**
**Dr. Sushmita Kaushik**
**Dr. Hemant Karad**
**Dr. Ashok Choudhry**

**Primary level- PHC**

**Community awareness**

*Suspect glaucoma at the PHC level*
By PMOA/Optometrist/MO
History of blindness/ glaucoma in family
Visual acuity <6/18 with pin hole
OR
Torch light examination
Pupil; AC depth
IOP by Schiotz tonometry only if trained eyecare personnel available
Telemedicine/ IT innovation when available
*If suspected, referral to secondary facility*
District hospital/ NGO/ Registered PP

**Comprehensive Eye Camp**

Govt/ NGO/ Private Sector

Optometrist/ Ophthalmologist/ Resident doctor

Screen all patients
- Visual acuity
- Torch light examination
  - Pupil
  - AC depth
- Fundus

All > 40 years or any AC abnormality
- IOP with Schiotz/ NCT

All family members > 40 years of known patients with glaucoma
- Who to refer

Any of the following
- Shallow anterior chamber with pupillary abnormality with TLE
- Any Cup-disc ratio >0.6/ asymmetry > 0.2
- IOP> 21 mm Hg

Whom to refer to
- Parent organization holding the camp
- Secondary level eye care facility
- Secondary level

Opportunistic screening of all patients > 40 years and where indicated coming to the Eye OPD
- Walk-in patients/Referred patients
- Internal referrals

Mandatory examination
- VA
- Slit lamp examination
- Applanation tonometry
- Fundus examination

In whom indicated (Pupillary abnormalities; shallow AC; IOP> 21 mm Hg; CDR>0.6 )
- Gonioscopy
- Perimetry

Sustainability
- Regular refresher courses for all personnel at primary and secondary level
  - Preferably incentive based
- Monitoring indicators and audit
  - Total number of patients seen
  - Number of patients referred from PHC
  - Number of patients diagnosed and treated for glaucoma
- Software required

**Future Directions**

Catch the undiagnosed in the community regardless of who comes to the PHC

**Recommendations for Screening**

- All Eye Camps should henceforth be mandatorily able to conduct comprehensive eye examination
- Increase financial outlay for all Eye Camps to enable comprehensive eye exams
- Hold workshop to assess the costing of a comprehensive eye camp and recommend appropriate budgets.
- Monitoring assessment and audit of glaucoma screening.
- Referral linkages based upon availability of technical human resource, equipment and service to be identified in all areas

## GROUP 4: MONITORING INDICATORS FOR GLAUCOMA SERVICES

**Dr GV Rao**
**Dr Harpreet Kapoor**
**Dr Mariam Mansuri**

Recommendation 1 – need of services

| Population | 1200,00,000 | Need | Existing appro | Gap/ required |
|---|---|---|---|---|
| Tertiary centres needed | 240 | (1 per 50,00,000 ) | 40 | 200 |
| Secondary level services | 2,200 | ( 1per 5,00,000) | 700 | 1,500 |
| Primary level services | 22,000 | (1 per 50,000 pop) | 3,000 | 19,000 |

**Recommendation 2 HR requirement**

- Set up glaucoma centre as per HR requirements
- Training and refresher courses for existing HR teams
- Develop and standardise the training curriculum for courses for ophthalmologist & opht technicians.
- Orientation course to ASHA workers

**Recommendation 3 Equipment / infrastructure**

- Upgradation of existing centres as per the suggested requirements
- All PHCs to be fully equipped to function as vision centres
- Recommendation 4 Services
- Comprehensive eye care inclusive of glaucoma management at tertiary, secondary level and in eye camps.
- Inclusion of glaucoma indicators in the NPCB data collection

## GROUP 5: RESEARCH PRIORITIES IN GLAUCOMA

**Prof Ramanjit**
**Prof Pandav**
**Dr Harsh Kumar**

1. Establish Disease pattern
   National Survey
   Every one Over 40
   NCT
   Slip lamp Examination VanHerrics
   Disc Pictures (non-mydriatic fundus camera)
   AS OCT
   Full Exam when
   IOP > 20 mmHg
   Disc Abnormality
   Narrow angles
   Next Stage
   Complete evaluation
   Nearest tertiary center
2. Glaucoma registry
   ICD 10 codes
   Nation wide

Tertiary care centers
Accessible at secondary level

3. Development of low cost diagnostic tools
   Functional testing / perimeter
   Imaging
   IOP
   Low cost
   Based on easily available computer technology
   Tie up with local industry
4. Innovations in Education
   Incentivize in job re-training/ updating
   Encourage health providers to attend CME etc.
   Develop curricula and methods of delivery for mandatory periodic updates.
   Use GSI website

5. Innovations in Healthcare delivery
   Mapping of glaucoma services available both in public and private.
   Develop equipment that can be used for comprehensive screening of eye disease
   AS photo, AS slit photo, Fundus photo,
   AS OCT
   Interactive patient management tools.
   Medical Audit

6. Use of Telecommunication
   Use low cost technology in peripheral centers
   Establishment of receiving center
   Experts available at receiving center
   Develop protocols for consultation with higher centers

7. Therapeutics Research
   Devise treatment protocols relevant to our population, keeping in mind we have a large population of ACG and socioeconomic conditions.
   Low cost medicines and their validation
   Improved methods of drug delivery / surgery

8. Standardization
   Of Diagnostic Equipment
   Repair facilities
   Software updates free of cost
   Transfer of Technology
   Develop standard SOPs

9. Qualitative Research
   Research on QOL of glaucoma patients

## GROUP 6: ADVOCACY AND AFFORDABILITY IN GLAUCOMA
## Gap analysis & recommendations

**Issues at Primary Level**

- Less priority to eye care and within that Glaucoma comes far behind Cataract and refractive error.
- Lack of awareness and knowledge about glaucoma among common people as well as health workers.
- Poor health seeking behavior
- People do not see a direct impact of treatment of glaucoma unlike cataract and refractive error; Treatment is lifelong – less compliance

- Poor accessibility to Treatment
- Cost of treatment is high
- Poor availability of resources (HR, Equipments, Drugs)

**Issues at Secondary Level**

- Less priority to treat Glaucoma. Cataract and RE get maximum importance.
- Inadequate training of HR to treat Glaucoma
- Lack of accountability
- Poor linkage with primary level
- Poor accessibility to Treatment
- Cost of treatment is high
- Poor availability of resources (HR, Equipments)
- Poor instrument maintenance support

**Issues at Tertiary level**

- Less priority to treat Glaucoma. Cataract and RE get maximum importance even at many tertiary centres.
- Inadequate training facility for HR in Glaucoma
- Lack of accountability in training as well as working
- Lack of research and innovation
- Less importance to public education
- Poor referral linkage with secondary level
- Poor availability of resources (HR, Equipments) in many centres
- Poor instrument maintenance support

**Recommendations: Advocacy**

- Giving glaucoma its due importance in Undergraduate training of doctors.
- Giving maximum importance to "Comprehensive Eye Examination" in post graduate teaching.
- Appropriately including Glaucoma in health workers' training.
- Communicate the findings of epidemiological studies on Glaucoma to policy makers and implementing officials at different levels.

**Recommendations: Advocacy**

- Making education materials more attractive
- Involve media in a bigger way
- Advocacy for making all eye screening camps comprehensive with minimal equipments
- Organize reorientation training of existing PMOA/ optometrists working in PHCs for detection of glaucoma
- Making Torch, Direct Ophthalmoscope and Schiotz tonometer available at PHCs

**Recommendations: affordability**

- Indigenous production of drugs, equipments and consumables
- Quality assurance
- Considering the patient's paying capacity while prescribing medicine
- Tele-ophthalmology to reduce non-clinical cost of treatment

**Recommendations: affordability**

- Considering Surgery as a practical option when affordability and non compliance are the issues. Research may create evidence about the long term results of surgery.
- Supporting cost of medicine from different sources – educating donors
- PPP in awareness creation and advocacy

**Recommendations:**

1. To impress upon NPCB that n addition to avoidable blindness the focus should also now be on irreversible blindness due to glaucoma
2. Set up a small expert group to carry forward these recommendations to the Govt for inclusion as part of the NPCB

**Expert Committee formed:-**

**Chair: Prof Ramanjit Sihota**

**Members**

1. Prof. Dr. SS Pandav
2. Dr. G. Chandrasekhar
3. Dr. Krishnadas
4. Dr. JKS Parihar
5. Dr. Vinay Nangia
6. Dr. Ronnie George
7. Dr. JC Das
8. Dr. Sushmita Kaushik
9. Dr. Praveen Vashisht
10. Dr. Suneeta Dubey
11. Dr. Harpreet Kapoor
12. Dr. Col. (retd) M. Deshpande
13. Dr. G V Rao

Subsequent to the entire group work presentations and discussion, workshop ended with a summing up & valedictory.

The workshop was exceedingly appreciated by all the participants. Some of the participants suggested holding more thematic workshops at different places.

- We would like to thank PGI, Chandigarh for hosting the main event.
- We would also like to thank all speakers & facilitators of the workshop for their able support for making the event a success.
- Our thanks to all the participants of the workshop.

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