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Chronic Glaucoma Case Finding and Treatment in Rural Africa: Some Questions and Answers

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Primary health care workers (clinic nurses, community health workers, traditional healers, and others) who work in the community and at primary care clinics should be involved in case finding of patients who have glaucoma.

Case Finding at the Primary Level: Can it Be Done?

As a part of their training in primary eye care, primary health care workers could be trained to case find glaucoma by:

1. Testing the visual acuity ('normal' or 'reduced').
2. Examining the colour of the pupil ('black' or 'white').
 - Reduced visual acuity in one or both eyes + black pupil = 'black blindness'/ visual loss ('glaucoma') Refer to secondary level

Many of these patients with 'black blindness' will not have visual loss due to glaucoma but may have a refractive error or other pathology that should still be dealt with at the secondary level.

All persons 40 years and over who are seen by primary health care workers for whatever reason could be screened in this way at least once every 2 years.

Case Finding at the Secondary Level: Should it Be Done?

Ophthalmic nurses and ophthalmic medical assistants could carry out case finding at the secondary level. As a part of their training, these cadres of eye workers should be trained to case find glaucoma by:

1. Discoscopy and measurement of the vertical cup : disc ratio.
2. Tonometry (either Schiötz or applanation).

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- IOP on Schiottz tonometry <28mmHg + vertical cup : disc ratio <0.6 ->'normal'
- IOP on Schiottz tonometry >28mmHg + vertical cup : disc ratio <0.6 ->'suspect case' -> refer to tertiary level for confirmation of diagnosis and treatment
- IOP on Schiottz tonometry <28mmHg + vertical cup : disc ratio >0.6 ->'suspect case' -> refer to tertiary level for confirmation of diagnosis and treatment
IOP on Schiottz tonometry >28mmHg + vertical cup : disc ratio >0.6 -> 'diagnosed case'->refer to tertiary level for confirmation of diagnosis and treatment.

All persons 40 years and over who are seen by secondary level eye workers for whatever reason could be screened for glaucoma in this way as a part of their routine examination, and this screening could be done at least once every 2 years. While it would be possible for presbyopia to be treated at the primary level, confining this to the secondary level would provide good opportunity for glaucoma case finding in these patients.

Confirmation of Diagnosis at the Tertiary Level: How Should This Be Done?

All 'suspect cases' and 'diagnosed cases' should be seen by the eye doctor at the tertiary level, for confirmation of the diagnosis and then for treatment. Visual field testing should confirm the diagnosis, but it may be impractical and unreliable in some patients. If it is considered inappropriate to use these, it would be necessary to rely on tonometry and discoscopy.

Treatment at the Tertiary Level: Should it Be Medical or Surgical?

What are some of the arguments in favour of medical treatment?

- It avoids the inconvenience and expense of surgery, and it avoids the risks of surgery.

What are some of the arguments against medical treatment?

It is expensive, it is life-long, it is inconvenient, it may cause unpleasant side effects, the treatment regimens may be confusing, it may be difficult for patients to collect and to store their medicines, patient compliance is poor, and it may be difficult for the service provider to ensure reliable supplies of the medicines.

What are some of the arguments against surgery?

- It is inconvenient, it is expensive, it carries risk, and there may be failure of the surgery.

What are some of the arguments for surgery?

- It is less expensive than medical treatment in the long run, there is better control of the intraocular pressure compared with medical treatment, and there is less visual field loss compared with medical treatment.

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Proposal: What About a Glaucoma Surgery Rate (GSR)?

We have a 'cataract surgery rate' that we use for the planning of our cataract services. Would it be helpful to use a 'glaucoma surgery rate' for the planning of our glaucoma services? If we make a number of assumptions, we could derive such a 'GSR' as follows:

1. For a population of one million people, the population over 40 years who are at risk is 25% = 250,000.
2. The prevalence of glaucoma in people over 40 years is 1-2% = 2,500 - 5,000 cases (in Africa, the prevalence could be double this rate).
3. Of the 5,000 cases, 50% have early glaucoma, 10% are already blind, and 40% (2,000 cases) have moderate, detectable, and treatable glaucoma.
4. As patients develop glaucoma, they progress slowly through the early to the intermediate to the late phase of the disease. If it takes 10 years to progress from 'onset of disease' to 'blind', it takes 4 years to progress through 'moderate / intermediate disease'.
5. Cases with moderate / intermediate disease are the priority target group for community case detection and surgery.
6. Therefore, each year the glaucoma surgery rate should be 500 per million population.

Whilst there are still too many assumptions about the prevalence, incidence, and rate of progression of the disease to be able to derive a reliable glaucoma surgery rate, this figure of 500 per million population per year is a conservative estimate of the numbers of glaucoma surgeries that we probably should be doing.

After weighing up the arguments for and against medical and surgical treatment:

1. In our blindness prevention programmes, glaucoma should be considered primarily a 'surgical' rather than a 'medical' condition.
2. Primary trabeculectomy (with adjunctive treatment with cytotoxic drugs or beta - irradiation, using a strontium 90 plaque if there is a risk factor for bleb fibrosis and failure) should be the first line of treatment.
3. Medical treatment should be reserved for 'failure' of surgical treatment (that is, bleb fibrosis and failure or inadequate intraocular pressure control following trabeculectomy).

What About Follow-up?

Patients who have had surgery could be followed up at the secondary level. Assuming adequate intraocular pressure control, they could be seen at regular 6 monthly intervals, when their examination should include measurement of the visual acuity, tonometry, and discoscopy. The ophthalmic nurse / ophthalmic medical officer could keep a register of glaucoma cases in their health district, so that patients can be contacted if they fail to attend for follow-up.

Relatives of patients with glaucoma should attend for assessment

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Summary of an Approach to Glaucoma in a Blindness Prevention Programme

1. For a population of one million people, there are an estimated 2,000 people with moderate, detectable, and treatable glaucoma.
2. Case finding at the primary level can be undertaken by:
 - Testing the visual acuity and examining the colour of the pupil
 - All people who are 40 years and over who are seen for whatever reason should be screened
 - Reduced visual acuity + black pupil = 'black blindness' (glaucoma); refer to secondary level.
3. Case finding at the secondary level can be undertaken by:
 - Tonometry and discoscopy
 - All people who are 40 years and over who are seen for whatever reason should be screened
 - Cases should be categorised 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.
4. Confirmation of diagnosis at the tertiary level may be done by repeat examination, with or without visual field examination.
5. Treatment of glaucoma should be as follows:
 - Primary trabeculectomy, with adjunct if indicated, should be the first line of treatment (the glaucoma surgery rate should be 500 per million population per year)
 - Medical treatment should be used if there is inadequate intraocular pressure control following trabeculectomy.
6. Patients whose intraocular pressures have been adequately controlled following trabeculectomy should be followed up at the secondary level at regular 6 monthly intervals. The keeping of a glaucoma register would ensure that no patients are lost to follow-up.