

Glaucoma in the developing world

The balance between benefits and harms of surgery varies in different settings

People living in developing countries have the highest risk of developing blindness from glaucoma.^{1 2} In east Asia, angle closure glaucoma predominates, whereas in Africa, the Indian subcontinent, and in Hispanic populations open angle forms are more common.^{1 3} Treatments vary depending on the type of glaucoma and the setting. In this week's *BMJ* a trial in South Africa by Murdoch's group shows that trabeculectomy augmented with β radiation significantly increases the success rate of surgery compared with surgery alone.⁴ However, people receiving β radiation also had a higher risk of operable cataract. Balancing the benefits of surgery with the risk of cataract formation is dependent on the setting in which glaucoma occurs.

Access to eye care is important, and as most ophthalmology services are in urban centres people often have to travel far.^{5 6} In Ghana, for example, people in rural areas present later in the course of disease and, therefore, with more blindness than those from urban areas.⁷ Good surgical treatment for glaucoma in the developing world is not readily available and most disease remains undetected. Funding in preventing blindness has focused on cost effective treatments such as cataract surgery, and conditions such as trachoma and onchocerciasis that can be prevented through primary care measures.^{1 6} Drugs for glaucoma are expensive, and staffing and equipment are limited.⁵ Thus compliance with medication is low and surgery is performed before medical treatment, in contrast to the developed world, where surgery is performed later.

Unlike cataract surgery, which immediately reverses blindness, treatment for glaucoma prevents deterioration so patients do not notice an improvement. They are told that they have a problem of which they may not be aware. Treatment may even initially make their vision worse. It is therefore not surprising that the acceptance of trabeculectomy is poor.^{6 8}

African people with glaucoma are affected at a younger age and by a more aggressive disease than white people,^{6 8} and medical treatment in this group is less effective.⁵ Black people also have higher failure rates of conventional trabeculectomy than white people.^{2 5} This may be related to racial differences in the wound healing response, which predispose black people to increased scar formation at the surgical site.⁵ Good evidence from randomised controlled trials and case control studies shows that adding antimetabolites such as mitomycin C and fluorouracil to trabeculectomy in African patients can improve success rates.^{2 9} However, there is a learning curve to their use because of increased risks of wound leak, low intraocular pressure, and infection. Regular postoperative follow-up is important, especially in augmented trabeculectomy, as manipulation of the operation site—such as suture removal or adjustment or breaking down of scar tissue—may be needed to maintain the function of trabeculectomy.¹⁰ Despite the proved benefits of current augmented treatments, they are not taken up in developing countries because of their cost, their complexity, and the need for regular follow-up.²

Cataracts are the most common cause of blindness worldwide, and cataract formation as a complication of trabeculectomy adds to the burden of preventable sight loss. People are less likely to return for further surgery if they do not perceive a benefit, especially if treatment for glaucoma makes their vision worse.

However, cataract formation after trabeculectomy is not a new complication even when surgery is augmented.^{2 11} It may vary between populations and with the type of glaucoma. In the study reported in this issue, it is possible that the incidence of cataract will increase in both groups over time, not just in people receiving β radiation and it is important to bear in mind when balancing benefits with harms that loss of vision due to cataract is reversible, whereas that due to glaucoma is not. Future research assessing combined surgery for cataract and glaucoma with β radiation would be useful, as would studies comparing augmentation with either mitomycin C or β radiation.

What should be the next steps? These will be governed by local factors. The diversity in populations and types of glaucoma, even within continents, has already been mentioned. A one size fits all model may be inappropriate for managing glaucoma in the developing world. Local research on the types of glaucoma and outcomes using different surgical techniques is needed. The provision and quality of local eye services will be important in deciding which surgical technique to favour. Access to good cataract surgery will improve compliance with glaucoma surgery in the long term. Patients who have had positive experiences with surgery or know others who have will be more likely to return for follow-up. Under these circumstances the proved advantages of augmenting trabeculectomy with β radiation can be put into practice.

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