

# Tackling Blindness from the Scourge of Glaucoma

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Glaucoma is a global public health concern and in Pakistan, we need an effective country wide response to ensure our people receive the care they deserve. The term glaucoma or more precisely the glaucomas, refers to a group of disorders, which have in common an intraocular pressure (IOP) sensitive optic neuropathy in association with ganglion cell loss and visual field defects.<sup>1</sup> In comparison to other Asian subregions, South Central Asia is expected to have the largest growth in glaucoma cases from 2013 to 2040, from 17.06 million to 32.90 million.<sup>2</sup>

In Pakistan, there are various barriers to receiving necessary care. Quality public health services may not be available or accessible. Access is also hampered by a lack of health facilities for 63 percent of the country's rural population, as well as insufficient infrastructure.<sup>3</sup> There is also a dearth of eye care professionals and in 2015, there were only 14.8 ophthalmologists per million people in Pakistan.<sup>4</sup>

To prevent and treat glaucoma, it is crucial to educate public, including patients at risk for or with glaucoma. Adult and paediatric glaucomas often present at a late stage, perhaps because symptoms may not be recognized early coupled with the lack of awareness in our population.<sup>5</sup> Additionally, in most developing nations, glaucoma cases go undetected in close to 90% of patients.<sup>3</sup> Early detection is therefore crucial.

Early detection may be done through screening

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programs; however, further research is needed to assess their efficacy in our populations.<sup>6</sup> Another approach is case finding, which involves assessing patients who fall into high-risk groups. Risk factors for Primary Open Angle Glaucoma (POAG) include age over 40 years, myopia, steroid use (by any route), exfoliation syndrome, diabetes, hypertension, migraine (for normal tension glaucoma) and family history of glaucoma. For primary angle closure, key risk factors include older age, female gender, hyperopia, and advancing cataract.<sup>6</sup> Involving front-line healthcare workers in early detection can be effective, and this can be combined with other screening programs, such as those for diabetes and/or cataracts.<sup>3</sup> Tools such as teleglaucoma may also be very helpful in offering point of care testing and bridging the gap between physicians and patients.<sup>3</sup> Developing a care pathway for glaucoma will also ensure patients receive quality care in the appropriate setting (either in their communities or in secondary or tertiary centers).

Glaucoma is diagnosed by assessing optic nerve structure and function. In lower middle income countries, such as Pakistan, the primary method to detect glaucoma is examination of the optic nerve.<sup>5</sup> Optical Coherence Tomography (OCT) assessment of the retinal nerve fiber layer is helpful when available.<sup>5</sup> Functional assessment involves assessing the patients visual complaints, visual acuity and mapping the visual field.<sup>5</sup> It is also important to measure IOP as part of any assessment.<sup>5</sup> Recall that normal tension glaucoma is a diagnosis of exclusion, meaning that it is important to rule out congenital or acquired causes of "pseudoglaucoma," such as trauma, shock, compressive, ischemic, or toxic optic neuropathy, as well as past IOP elevation.<sup>7</sup>

Management of patient at risk or with glaucoma entails a holistic approach to preserving and improving

quality of life.<sup>8</sup> This includes patient education, assessment, treatment of ocular and relevant systemic diseases as well as support for the patient's emotional/psychological health, and well-being.<sup>8</sup> When patients are given a diagnosis of glaucoma (or glaucoma suspect), they may feel anxious, and it is our responsibility to offer compassion and hope.<sup>8</sup> Cornerstones of glaucoma management include identifying the underlying cause(s) and addressing this whenever possible (e.g. in neovascular or uveitic glaucoma) as well as lowering IOP to target ranges via medical, laser or surgical approaches.<sup>5</sup> This is very well covered in the revised Pakistan Glaucoma Association (PGA) guidelines that will Insha'Allah be released soon. Establishing a target IOP range can be done taking numerous aspects into account, including stage of glaucoma, pre-treatment IOP, longevity, data synthesis from multiple randomised clinical trials (RCTs), and the benefit versus risks of treatment.<sup>5</sup> Poor compliance with glaucoma treatment may stem from lack of patient knowledge about the disease and the cost of treatment as well as other factors.<sup>3</sup> This, along with further research into etiologies and novel treatment approaches, is an important area for further research.

More research is also needed to determine the mix of glaucomas in various subpopulations within Pakistan (e.g., exfoliative glaucoma appears to be common in Northern Pakistan) and to determine how effective conventional as well as newer therapies are in our diverse populations. It is worth validating the findings of various RCTs to ensure that we know what works in our patients. For this purpose, it is helpful to refer to available studies, for example on the following website: [https://eyewiki.org/Clinical\\_Trials\\_in\\_Glaucoma](https://eyewiki.org/Clinical_Trials_in_Glaucoma)

For patient presenting late, it is important that we offer support rather than send the message that 'nothing more can be done'. One of us (KD) recalls a child with primary congenital glaucoma who lost nearly all vision despite multiple surgeries. With support from the eye care team, family and the community, the child has done very well and has gone on to become a percussion wizard, play ice hockey, and champion the use of tech gadgets for those with visual impairment. Although visual rehabilitation services exist in Pakistan, more are needed. A team approach to care engaging eye care professionals, occupational therapists and psychologists will enable patients to receive support related to magnification and

lighting, orientation and mobility as well as much needed psychosocial support.<sup>8</sup>

Preventing avoidable blindness from glaucoma cannot be done as a stand-alone activity; it must be deeply ingrained in our national health programs and systems.<sup>9</sup> This necessitates developing centers of excellence for glaucoma and training human resources at all levels (including allied health, general ophthalmologists, and glaucoma subspecialists). The WHO's LVPEI pyramidal model of eye care delivery has been successful in several developing countries, such as Nepal's 'Tilganga' institute.<sup>3</sup> Fostering quality leadership is also essential to the success of any institution upholding global best practice standards for glaucoma care.<sup>1</sup>

Targeting visual impairment in underdeveloped nations results in a benefit to cost ratio of 4:1.<sup>9</sup> One way to handle the financial aspect is to choose cost effective procedures e.g. for a patient who needs cataract and glaucoma surgery, manual small-incision cataract surgery (MSICS) and trabeculectomy with Mitomycin C (MMC) can be a safe alternative to phacoemulsification and trabeculectomy with MMC;<sup>3</sup> when microinvasive glaucoma surgery (MIGS) is an appropriate choice, it can be performed using the GATT, BANG or another cost effective technique.<sup>10</sup>

Glaucoma is a lifelong disease. Adopting a public health approach to addressing this scourge entails building a close relationship between the patient and health care providers through the development of a robust health system approach and leveraging the power of well-trained human resources and cost-effective technologies.

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