

Glaucomas in Africans

Ian Murdoch

Institute of Ophthalmology, Bath Street, London EC1V 9EL11

INTRODUCTION

It is with great pleasure I accept the task to produce a series of thought windows on a subject that challenges me daily ... the glaucomas! I thought a series of short pieces might be more digestible, so if, for example, you feel frustrated that I have not amplified on disc diagnosis for the glaucomas or classification of the glaucomas, etc., then either drop me a note with suggestions or wait a little and the subject may crop up anyway in fullness of time.

GLAUCOMAS

Glaucomas are a group of diseases with a common endpoint, a characteristic optic neuropathy. This characteristic neuropathy is associated with loss of visual function most commonly assessed by visual field testing. The classification of this group of diseases remains incomplete. If the pressure is increased sufficiently in an eye for a long enough period

then this results in the optic neuropathy of glaucoma. This happens in all secondary glaucomas. There was confusion some years ago in our understanding of the disease, since intraocular pressure was included in the definition of the disease. With the advent of population studies it became apparent that, in some populations, a significant proportion of those with the characteristic neuropathy and changes of visual function did not have intraocular pressures raised above the range for the normal population. In 1989 Al Sommer wrote a short article which changed the way IOP is considered from *definition* to *major risk factor* for glaucomatous optic neuropathy.¹

The definition of glaucomatous optic neuropathy remains a challenge with no clear descriptor ahead of any others. A proposal based on centiles of normal populations has been published for epidemiological studies (table 1).² I personally find George Spaeth's DDLS very helpful (figure 1).

Table 1. Foster et al scheme for diagnosis of glaucoma in cross sectional prevalence surveys (The diagnosis is made according to three levels of evidence)²

Category 1 diagnosis (structural and functional evidence)	Eyes with a CDR or CDR asymmetry >97.5th percentile for the normal population, or a neuroretinal rim width reduced to <0.1 CDR (between 11 to 1 o'clock or 5 to 7 o'clock) that also showed a definite visual field defect consistent with glaucoma.
Category 2 diagnosis (advanced structural damage with unproved field loss)	If the subject could not satisfactorily complete visual field testing but had a CDR or CDR asymmetry > 99.5th percentile for the normal population, glaucoma was diagnosed solely on the structural evidence. In diagnosing category 1 or 2 glaucoma, there should be no alternative explanation for CDR findings (dysplastic disc or marked anisometropia) or the visual field defect (retinal vascular disease, macular degeneration, or cerebrovascular disease).
Category 3 diagnosis (Optic disc not seen. Field test impossible)	If it is not possible to examine the optic disc, glaucoma is diagnosed if: 1. The visual acuity <3/60 and the IOP >99.5th percentile, or 2. The visual acuity <3/60 and the eye shows evidence of glaucoma filtering surgery, or medical records were available confirming glaucomatous visual morbidity.

Please never lose sight of the fact that, with the exception of the rarer childhood glaucomas, age remains the most important risk factor for the glaucomas followed by IOP and then family history.

Africans

It is an undisputable fact that Africa has the most diverse phenotypic demonstration of the human form. This is no surprise since genetically we probably all derive from a single ancestor on the continent, hence the genetic pool has

been creating variety for the longest period.⁴ Thus Fula, Masai, Zulu, Hausa, Ewe, Surma, Darod, etc can often be distinguished by their phenotype. As noted above, family history is the third most important risk factor for many glaucomas, implying a genetic element and indeed some genes are beginning to be linked to various forms of the glaucomas.^{5,6,7} It may be no surprise therefore if the pattern of glaucomas differs between different African populations... Africans.

DDLS Stage	Narrowest width of rim (rim/disc ratio)			DDLS Stage	Examples		
	For Small Disc <1.50 mm	For Average Size Disc 1.50-2.00 mm	For Large Disc >2.00 mm		1.25 mm optic nerve	1.75 mm optic nerve	2.25 mm optic nerve
0a	.5 or more	.4 or more	.3 or more	0a			
0b	.4 to .49	.3 to .39	.2 to .29	0b			
1	.3 to .39	.2 to .29	.1 to .19	1			
2	.2 to .29	.1 to .19	less than .1	2			
3	.1 to .19	less than .1	0 for less than 45°	3			
4	less than .1	0 for less than 45°	0 for 46° to 90°	4			
5	0 for less than 45°	0 for 46° to 90°	0 for 91° to 180°	5			
6	0 for 46° to 90°	0 for 91° to 180°	0 for 181° to 270°	6			
7a	0 for 91° to 180°	0 for 181° to 270°	0 for more than 270°	7a			
7b	0 for more than 180°	0 for more than 270°		7b			

Figure 1. Spaeth's Disc Damage Likelihood Scale (DDLS) nomogram.³

DDLS is based on the radial width of the neuroretinal rim measured at its thinnest point. Unit of measurement is rim/disc ratio (ie, the radial width of the rim compared to the diameter of the disc in the same axis). When there is no rim remaining, the rim/disc ratio is 0. The circumferential extent of rim absence (0 rim/disc ratio) is measured in degrees. Caution must be taken to differentiate the actual absence of rim from sloping of the rim as, for example, can occur temporarily in some patients with myopia. A sloping rim is not an absent rim. Because rim width is a function of disc size, disc size must be evaluated prior to attributing a DDLS stage. This is done with a 60D to 90D lens with appropriate corrective factors. The Volk 66D lens minimally underestimates the disc size. Corrective factors for other lenses are: Volk 60D × .88, 78D × 1.2, 90D × 1.33; Nikon 60D × 1.03, 90D × 1.63.

Another aspect to this is the rich and diverse cultural approaches to health and therapy. A majority of glaucomas are asymptomatic until it is late in the disease process. Finding cases and giving preventive therapy is a challenge in any community. Acceptance of interventions will vary and the clinician must be prepared to approach and adapt the subject of case findings and therapy to the cultural setting of their local community.

GLAUCOMAS IN AFRICANS

For any ophthalmologist hoping to work on the challenge of glaucomas in their local community it is vital they appreciate the community in which they work will be unique. The demography, basic ocular parameters, disease patterns, acceptance of case findings, acceptance of therapy and many other factors will vary. They should modify their practice accordingly.

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