

Chronic Glaucoma in Northern Ghana—A Retrospective Study of 397 Patients

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Summary

A retrospective study of 397 patients with chronic glaucoma in North-East Ghana seen in 1986/87 showed 71% of the patients to be male and 26% to be aged under 40 years. Fifty two per cent of eyes were already blind (V/A less than 3/60) at presentation. Blindness was associated with younger age at presentation, and greater distance of residence from the hospital.

Only 19% of patients undergoing treatment were attending for follow-up at six months. Of those patients treated medically who returned for follow-up at six months only 17% had an intraocular pressure less than 22 mmHg. While of the patients treated surgically 84% of those seen at six months had an IOP below 22 mmHg.

In parts of West Africa, chronic glaucoma is responsible for over 20% of blindness (binocular visual acuity less than 3/60).¹ Glaucoma occurs at an earlier age, is more aggressive and is said to respond less well to treatment in people of African origin.^{2,3} In an effort better to understand some of the factors which lead to blindness from glaucoma in West Africa a retrospective study of 397 patients with chronic glaucoma was undertaken in Northern Ghana at Bawku hospital.

Methods

A description of the hospital and terrain is given elsewhere.⁴ Records of all patients attending Bawku Hospital between January 1 1986 and July 30 1987 (19 months) were examined in order to identify patients presenting with chronic glaucoma. Those with acute glaucoma or obvious secondary glaucoma (eg

trauma, swollen lens) were excluded. Because gonioscopy was not routinely performed it was not possible to distinguish between patients with chronic open angle and those with chronic angle closure due to peripheral anterior synechiae.

The diagnostic criteria used for inclusion in the study were an intraocular pressure greater than 28 mmHg (Schiotz), in the presence of documented pathological cupping of the optic disc. Information on visual field examination was not usually available. From the patient's hospital record, age (sometimes estimated), sex, residence, visual acuity, intraocular pressure, optic disc appearance, treatment, duration of follow-up and outcome were recorded.

Associations between blindness at presentation, age, sex and distance of residence from the hospital were analysed using multivariate log linear regression on an IBM compatible

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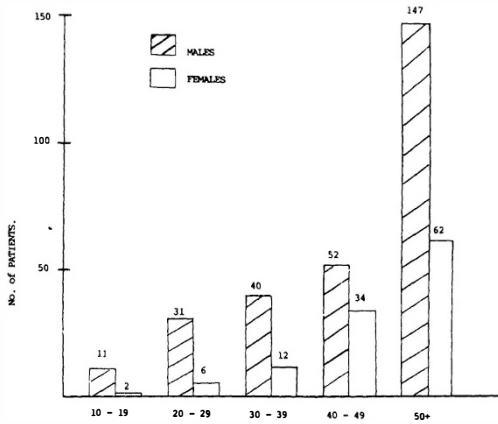


Fig. 1. Distribution of 397 patients with chronic glaucoma by age and sex.

AT microcomputer. The data was also analysed for patient response to treatment and follow-up.

Results

Of the 397 patients, 71% were male and 29% female. Twenty six per cent were aged less than 40 years at presentation (Fig. 1).

Complete data on age, sex, visual acuity and distance of residence from hospital was available on 379 patients. The visual acuity at

presentation for different age groups is given in Figure 2. Overall 34% of patients had a best visual acuity of less than 3/60, and 52% of eyes were already blind (less than 3/60) at presentation. Fifty three per cent of men and 69% of women came from within 50 miles of the hospital, while 29% of men and 17% of women came from over 100 miles.

The numbers of patients by age group, sex, distance of residence from hospital and blindness are shown in Table I. Multivariate log-linear modelling was applied to the data. There was a significant association between being blind at presentation and age. The association was opposite to what one might expect, ie the younger the patient the greater the risk of blindness ($P < 0.001$). (Table II).

Both distance of residence from hospital and sex of the patient influence the risk of blindness, and interact with each other. Females are more likely to be blind at presentation than males. The further the place of residence from hospital the greater the risk of blindness. Being female and living more than 50 miles from the hospital further increases the risk of blindness ($P = 0.015$). (Fig. 3)

For those patients living more than five miles from the hospital 57% referred to the hospital had 6/18 vision or better compared

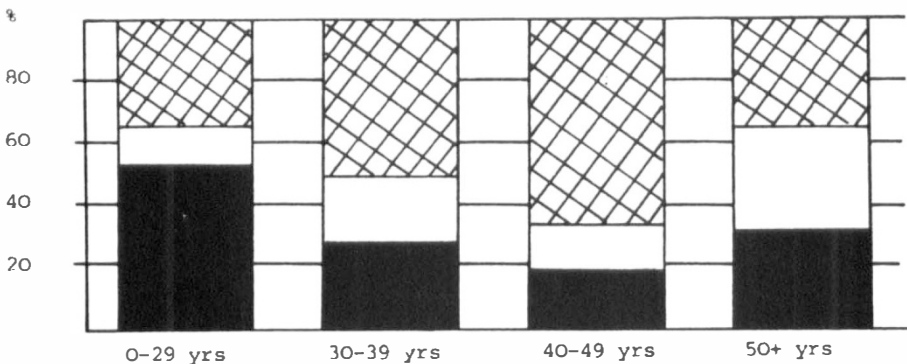
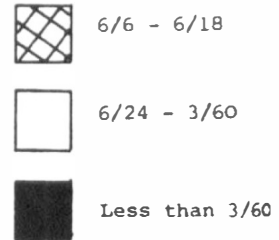


Fig. 2. Visual acuity in the best eye at presentation in 397 patients with chronic glaucoma.

Table I 219 patients by age and sex according to visual status who lived within 50 miles of Bawku hospital

Age	Males			Females		
	Not blind:	Blind:	Total	Not blind:	Blind	Total
10-19	3	1	= 4	1	0	= 1
20-29	8	8	= 16	3	2	= 5
30-39	17	5	= 22	7	2	= 9
40-49	24	4	= 28	18	3	= 21
50+	50	22	= 72	28	13	= 41
	102	40	= 142	57	20	= 77

160 patients by age and sex according to visual status who lived more 50 miles from Bawku hospital

Age	Males			Females		
	Not blind:	Blind:	Total	Not blind:	Blind	Total
10-19	3	3	= 6	0	1	= 1
20-29	4	11	= 15	0	1	= 1
30-39	10	4	= 14	0	2	= 2
40-49	14	6	= 20	10	3	= 13
50+	46	24	= 70	5	13	= 18
	77	48	= 125	15	20	= 35

with 38% who were self-referrals. The intra-ocular pressure was greater than 40 mmHg in 72% of eyes of patients aged under 30 years, 61% of those aged 30-49 years and 64% of those aged 50 years or more.

Medical treatment (pilocarpine drops, timolol drops or acetazolamide tablets alone or in combination) were given to 137 patients, and surgical treatment (trabeculectomy) was carried out in 188 patients. The decision for medical or surgical treatment was made on the preference of the patient and availability of surgery at the time of diagnosis. Only 30% of patients given medical treatment returned after two months for follow-up and by six months the number had fallen to 22%. Twenty two per cent of patients seen at two months, and 17% seen at six months had an intraocular pressure of less than 22 mmHg in at least one treated eye. Only 4% of patients treated medically were attending follow-up

Table II Multivariate log-linear modelling applied to risk factors associated with blindness

Risk factor	Ratio statistic	DF	P value
Age	22.67	4	<0.001
Distance and Sex	5.19	1	0.015

and had an IOP less than 22 mmHg at six months.

Of the 188 patients treated by trabeculectomy 39% were seen at two months and 17% at six months. Eight six per cent of patients seen at two months, and 84% at six months

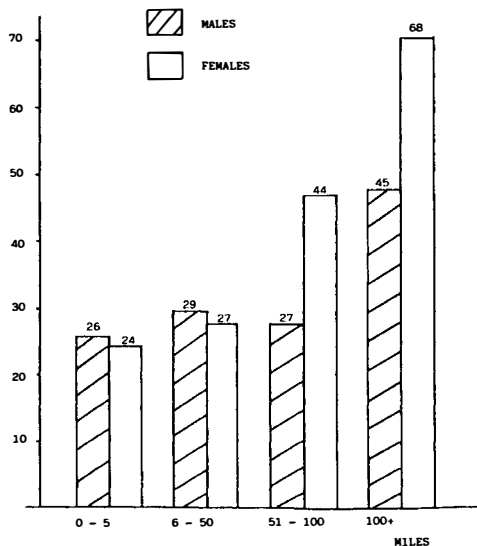


Fig. 3. % of patients blind in both eyes from chronic glaucoma by distance of residence from Bawku Hospital for males and females (n = 379 patients).

had an intraocular pressure of less than 22 mmHg in at least one treated eye (Fig. 4). Overall, only 19% of patients diagnosed as having glaucoma and given medical or surgical treatment were still attending for review at six months.

Discussion

Chronic glaucoma is a common cause of blindness in many parts of West Africa. The type of chronic glaucoma, either open angle or chronic angle closure could not be determined in this retrospective study, nor is it possible to know whether other ocular disease, particularly onchocerciasis may have contributed to the aetiology of glaucoma in some of the patients.

With these limitations in mind, it is useful to note some features of patients presenting with glaucoma, and the risk factors for blindness from glaucoma.

(a) Sex

There were more male patients than female (7:3). This may reflect a true difference, but is probably also because travelling is easier for

men, who may also be more aware of available health care. Female patients were more likely to live nearer the hospital and were usually older at presentation than men. Onchocerciasis is more common in males which may be a contributory factor to the high male to female ratio.⁴

(b) Age

Twenty six per cent of patients were aged under 40 years at presentation. This early age of onset contrasts with chronic glaucoma in Caucasians. This is supported by evidence that black Americans have an earlier age of onset of glaucoma.⁵

Younger patients were more likely to present blind than older patients. It is possible that the earlier onset of disease is associated with a more aggressive and rapid rise in intraocular pressure. Chronic glaucoma in younger people may have a different aetiology from that in the older population⁴ and needs further investigation.

(c) Distance from Eye Care

Nearly half the men and a third of the women

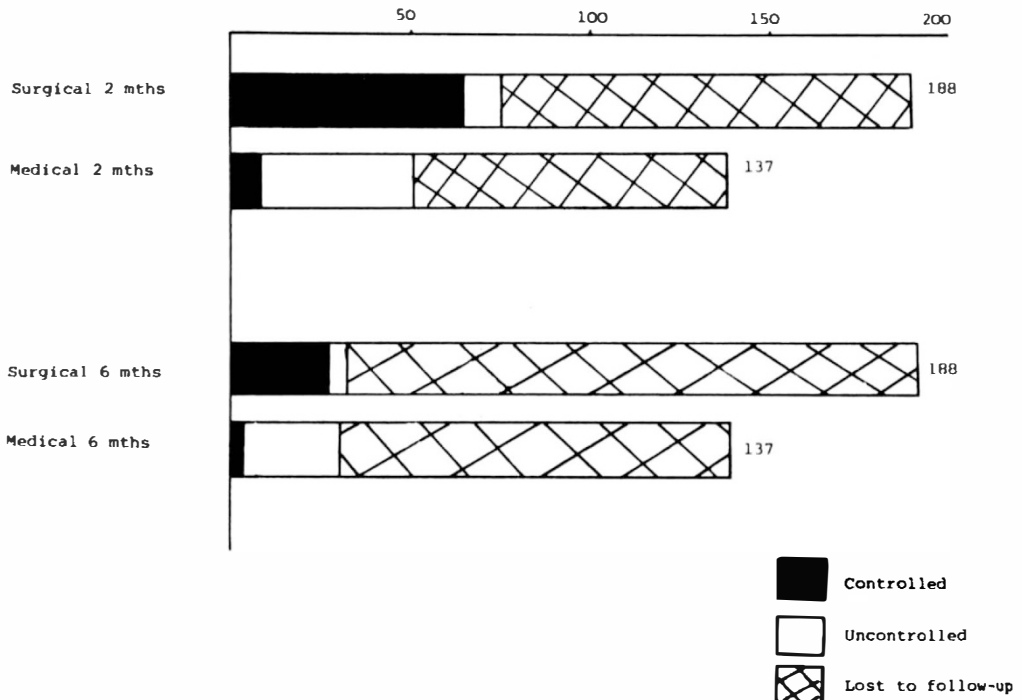


Fig. 4. Response to medical and surgical treatment.

travelled more than 50 miles to obtain eye care. Patients living more than 50 miles from the hospital were four times more likely to present blind than patients living within 50 miles of the hospital (Fig. 3). Patients who were referred to Bawku having been examined in their villages by the mobile eye team had more preservation of vision than people who were self referred.

(d) Treatment Possibilities

The treatments presently available for chronic glaucoma are medical therapy, laser trabeculoplasty or filtration surgery. Laser trabeculoplasty may have limited long-term efficiency,⁶ and the technology is not available in most areas of Africa.

Medical treatment is unsatisfactory for the majority of patients because of lack of available medicines, expense, and poor compliance, as shown by the fact that only five patients out of an initial 137 treated medically had controlled intraocular pressure at six months follow-up.

Filtration surgery has been reported to give good^{7,9} and poor^{10,11} results in African eyes. Long term follow-up studies are required to see what the five and ten year success rate of surgery will be in the African patient. In this series we were only able to follow-up 39% of trabeculectomy patients at two months and 17% at six months, but of those followed up, 86% at two months, and 84% at six months had an intraocular pressure below 22 mmHg without medical therapy. For the time being, there is little alternative to filtration surgery for the majority of patients with chronic glaucoma in Africa, who still have vision worth preserving.

Prevention of Blindness from Chronic Glaucoma in Africans

The majority of patients in West Africa with glaucoma present for treatment late. A major factor is the long distances patients often have to travel in order to receive treatment. This is also reflected by the extremely poor rate of follow-up after treatment (19% at six months). It is therefore essential to have a simple means of identifying patients at high risk of having glaucoma available in health care facilities close to where patients live.

The possible criteria for referral which may be used by appropriately trained health workers depending on the availability of diagnostic equipment are:

- (i) A vertical cup:disc ratio of 0.6 or more on ophthalmoscopy.
- (ii) An intraocular pressure greater than 28 mmHg (Schiotz or Glaucotest)
- (iii) Unexplained loss of vision (55% of patients had vision in their better eye of less than 6/18)

Using these criteria it is likely that patients will be referred earlier to a specialist, while there is still the possibility of preserving a useful amount of vision in at least one eye. It is inevitable that a number of people will also be referred who do not have glaucoma.

At the present time filtration surgery offers the best hope for control of intraocular pressure and preservation of useful vision in the majority of African patients with chronic glaucoma.

Conclusion

Chronic glaucoma is a major cause of blindness in West Africa occurring in young as well as older people. Screening for glaucoma should therefore include people under the age of 40 years.

Early referral of patients with either, unexplained loss of vision, intraocular pressure over 28 mmHg, or vertical cup:disc ratio 0.6 or greater, could help diagnose patients at a stage when useful vision may still be preserved.

Filtration surgery is preferable to present medical therapy for the majority of patients from rural areas of West Africa, where the availability of medicines and follow-up services are limited.

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