

THE ROLE OF THE GENERAL PRACTITIONER IN THE EARLY DETECTION OF CHRONIC SIMPLE GLAUCOMA

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It is not, in my experience, generally recognized among the body of general practitioners that 3-4% of people over the age of 45 years suffer from a potentially blinding disease. These patients have no eye symptoms or signs apart from a raised intraocular pressure. They have early chronic simple glaucoma with, as yet, none of the sequelae, e.g. cupping and later atrophy of the optic disc, field loss and eventual blindness. Detection and treatment at this early stage is an ideal that all should strive for, but which is rarely attained. This can only be done by routine tonometry (measurement of the intraocular pressure) of all patients in this age group.

Mass screening surveys, by means of tonometry, for the detection of glaucoma, were first carried out in the USA and the results of these are of interest. They also confirm what has been stated in the previous paragraph. I will discuss some of these results, together with similar observations from my private practice.

MASS SURVEYS FOR GLAUCOMA

One of the earliest of these was conducted in 1958 at the outpatient clinics of the University of Tennessee School of Medicine.² Routine tonometries with subsequent provocative tests, where indicated, were performed on 1,120 patients without eye symptoms or signs. Of these, 313

persons with elevated tensions were discovered. With further tests 49, or 4% of the total, were proved to have glaucoma.

These results have been confirmed by other mass screening projects in a city-wide survey in Cleveland,³ and a 10-day survey at the San Diego Country Fair, Del Mar, California³ where 3,986 persons were tested at random. In these surveys the incidence of proved glaucoma in the absence of ocular symptoms or visible signs varied between 3 and 4%.

A review of patients from my own private practice has confirmed these figures, although the numbers involved are naturally much smaller. It is my practice to perform routine tonometries on all patients over 45 years of age. During the year March 1960-February 1961, inclusive, 140 patients were subjected to this test. These were all patients in whom the ocular examination, apart from tonometry, was regarded as normal. Of these, 9 were found to have a raised tension. These were investigated, and 4 of them, or 3% of the total, were proved to have early chronic simple glaucoma. The criterion for this diagnosis was the presence of ocular hypertension (i.e. a tension of more than 25 mm.Hg on the 1955 scale) and at least 2 positive provocative tests out of 3 (tonography; water-

TABLE I. FINDINGS IN 4 PATIENTS WITH CHRONIC SIMPLE GLAUCOMA

Patient	Age (years)	Corrected vision	Tension (applanation tonometry)	Fields	Angle	Tonography	Water-drinking test	Po/cf
1. Mr. M.	70	R = 6/6 L = 6/6	R = 24 L = 19	Normal	Broad and open in both eyes	R = 0.08 L = 0.08	R = - ve L = - ve	> 100 > 100
2. Mrs. L.	62	R = 6/6 L = 6/6	R = 24 L = 24	Normal	Medium open in both eyes	R = 0.13 L = 0.08	R = - ve L = - ve	> 100 > 100
3. Mrs. B.	70	R = 6/9 L = 6/6	R = 30 L = 20	Right arcuate scotoma	Broad and open in both eyes	R = 0.17 L = 0.22	R = + ve L = + ve	> 100 > 100
4. Mrs. M.	61	R = 6/6 L = 6/6	R = 24 L = 21	Normal	Broad and open in both eyes	R = 0.35 L = 0.08	R = + ve L = - ve	> 100 > 100

drinking test; and tonography after water, where $Po/cf = > 100$)—see Table I.

One patient showed an early arcuate scotoma in one eye; in the remainder the fields were normal.

DISCUSSION

General practitioners are well aware of the importance of primary glaucoma as a cause of blindness, and this point need hardly be stressed. Some 9% of total blindness is due to this disease.⁴ They know that it may present as either an acute or chronic disease. The acute attack is easy to recognize, and occurs early in the clinical course of the disorder, so that the institution of prompt treatment and adequate follow-up will prevent the occurrence of sequelae from a persistently raised intraocular pressure.

This is termed acute closed-angle glaucoma, because the rise in tension is a consequence of mechanical closure of the anterior chamber angle (filtration angle), occurring when the iris is pushed up against the back of the cornea. This blocks the angle, resulting in acute embarrassment to aqueous drainage.

Chronic Simple Glaucoma

The picture is quite different, however, in the patient with primary chronic glaucoma (chronic simple glaucoma). In this condition the rise in ocular tension is insidious, maintained over a long period of time, and symptomless. The initial feature is ocular hypertension, occurring at first intermittently and mainly in the mornings, later becoming chronically raised (*cf.* essential hypertension).

The condition is not as a rule diagnosed during this phase of the disease, and it is only later, when sequelae manifest themselves, that the patients are recognized as having glaucoma. These sequelae are cupping and later atrophy of the optic discs with field loss. Progressive atrophy and field loss lead to ultimate blindness. It is important to realize that the visual acuity remains normal until the very late stages.

This clinical picture is well known to undergraduates and practitioners. What is not so well recognized, in my experience at any rate, is that these sequelae are present only in the very late stages of the disease. It has been estimated that a persistently raised intraocular tension must be present for over 15 years before cupping of the optic disc appears.⁵

Once this has set in it cannot be reversed in the present state of our knowledge; thus the patient is left with a permanent field loss. The best that can be hoped for is that, with adequate control of the tension, further deterioration will be prevented.

The obvious question that springs to mind is: could these incurable sequelae not be prevented by early diagnosis and prompt treatment? The answer is not yet fully known. While it is generally accepted that cupping of the disc is an inevitable consequence of prolonged ocular hypertension acting mechanically on the nerve head, we are not yet sure whether arteriosclerotic ischaemia contributes to this and, if so, by how much.⁶ Nevertheless,

it is a clinical fact that cupping is rare in the absence of raised ocular tension and that its early control will prevent this in most cases. This is the ideal and can be attained only if all patients over 45 years of age have their intraocular pressure checked regularly and as a routine. The disease is rare before this age.

Testing Intraocular Pressure

It is here that the general practitioner plays a vital part. Most people are content to have 'eye tests' done by medically unqualified personnel. These are not ocular examinations, but merely refractions, and here again I stress the point that visual acuity remains normal or nearly normal until the disease is far advanced. The visual fields, on the other hand, are affected at an earlier stage. The family doctor, therefore, responsible as he is for the general health of his patients, must include in this context their ocular health. I feel that tonometry should be included as part of his routine examination of those of his patients who fall into the relevant age group. There are 2 methods of assessing ocular tension:

1. *Digital palpation*: Although this has limited use in skilled hands, it is too inaccurate to be of general value.

2. *Tonometry*: This is an easily mastered technique and the instrument used is not costly. Undergraduates are taught its use during their attendance at ophthalmology outpatient departments, but I feel that often the importance of its routine use is not adequately stressed. I would also venture to suggest that arrangements should be made to demonstrate the technique at postgraduate refresher courses, together with a clear account of its value.

Having established that a patient has a raised (i.e. greater than 25 mm.Hg on the 1955 Friedenwald scale) or borderline tension (greater than 21 mm.Hg), further investigations are required. These require the services of an ophthalmologist, who will then have to decide whether this is a true case of glaucoma or not. This is done by measuring the unit outflow of the aqueous humour from the anterior chamber, under normal and provoked conditions (provocative tests). In glaucoma the outflow is reduced.

SUMMARY

The reported incidence of symptomless early chronic simple glaucoma in the general population is confirmed. A plea is made for the more active participation of the family doctor in the recognition of this disorder, thereby avoiding late complications. This can best be achieved by routine tonometry (measurement of the intraocular pressure) as part of the general examination of all patients over 45 years of age.

REFERENCES

1. Horsley, M. E., Lewis, P. M. and Packer M. (1958): *J. Amer. Med. Assoc.*, **166**, 1265.
2. Wolpaw, B. J. and Sherman, A. W. (1954): *Sight-sav. Rev.*, **24**, 139.
3. Power, J. L. (1957): *Amer. J. Ophthal.*, **44**, 696.
4. Marshall, J. and Smith, C. M. (1932): *Trans. Ophthal. Soc. U.K.*, **52**, 282.
5. Leydhecker, W. (1959): *Docum. ophthal. ('s-Grav.)*, **13**, 357.
6. Duke-Elder, S. (1947): *Textbook of Ophthalmology*, vol. 3, p. 3354. London: Henry Kimpton.