

GLAUCOMA IN THE ISLE OF MAN*† WITH SPECIAL REFERENCE TO PSEUDO-CAPSULAR EXFOLIATION

BY

D. B. CLEMENTS

Liverpool

It has for some time been the clinical impression at St. Paul's Eye Hospital that cases of open-angle glaucoma referred from the Isle of Man to the mainland for investigation were frequently found to be associated with pseudo-capsular exfoliation of the lens. It is well known that glaucoma capsulare occurs frequently in Scandinavian countries and, as the Isle of Man was colonized by Vikings in the 9th and 10th centuries, it is conceivable that a high incidence might be found in the indigenous island population. The present study was designed to assess the incidence of glaucoma capsulare among islanders known to suffer from glaucoma.

Method

The population of the Isle of Man is limited and the total number of glaucoma cases correspondingly small. Accordingly, an attempt was made to examine all known cases of glaucoma attending the ophthalmic clinic at Nobles Hospital, Isle of Man. Altogether 75 cases were identified and of these 59 were examined.

Each patient was examined with the slit lamp with undilated and dilated pupils. Dilatation of the pupils was omitted in four cases of angle-closure glaucoma in which operation had not been performed. Intra-ocular pressure was assessed in all cases with a weighted Schiøtz tonometer; applanation tonometry could not be performed because there was no instrument on the island. The fundi were also examined. A clinical diagnosis of the type of glaucoma was made with the assistance of the case notes.

For the purposes of this study the following diagnostic criteria were used:

(1) *Chronic Simple Glaucoma*

- (a) Repeated elevation of the intra-ocular pressure above 25 mm. Hg Schiøtz.
- (b) Pathological cupping of the optic disc.
- (c) Loss of visual field.

(2) *Glaucoma Capsulare*

Patients showing the features of chronic simple glaucoma and in addition pseudo-exfoliation of the lens capsule as observed with the slit lamp.

(3) *Acute Glaucoma*

- (a) History of headache, haloes, and vomiting.
- (b) Narrow angle or shallow anterior chamber.

(4) *Secondary Glaucoma*

Patients with a history of anterior uveitis; in this small series uveitis and pseudo-exfoliation were the only causes of secondary glaucoma.

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† Address for reprints: Alder Hey Hospital, Liverpool.

(5) *Glaucoma not yet Proven*

The existence of this category of patients in a group attending with a diagnosis of glaucoma may seem surprising, but these were patients attending with a history of mild elevation of the intra-ocular pressure, without either cupping of the disc or field loss. Most of these could probably be shown to be pre-glaucoma cases by the use of tonography.

In addition it was decided to separate off, as far as possible, those of true Manx descent from non-Manx people living on the island. Accordingly, the patients were divided into two groups:

- (a) *Manx* Those born in the island.
- (b) *Non-Manx* Those not born on the island.

Results

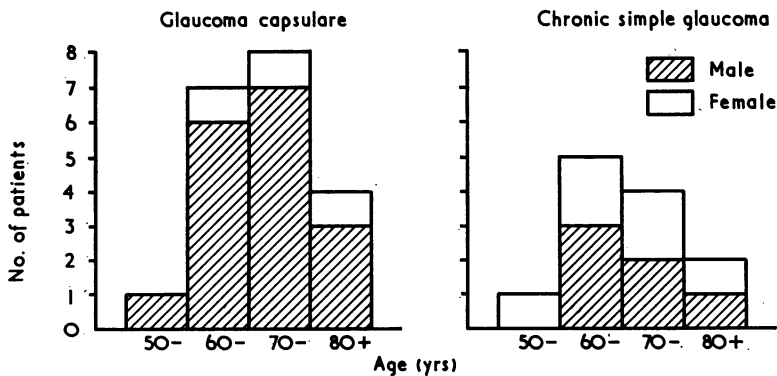
The distribution of cases into clinical categories is shown in the Table.

TABLE
DIAGNOSIS IN 59 CASES OF GLAUCOMA, BY SEX AND PLACE OF BIRTH

Type of Glaucoma	Manx			Non-Manx			All Cases
	Male	Female	Total	Male	Female	Total	
Chronic Simple	6	6	12	2	8	10	22
Capsulare	17	3	20	1	0	1	21
Acute	0	2	2	0	4	4	6
Secondary	0	2	2	0	0	0	2
Not proven	1	4	5	1	2	3	8
Total	24	17	41	4	14	18	59

For males born on the island the incidence of glaucoma capsulare is 17/23, 74 per cent. of all glaucoma cases. For females born on the island the incidence is probably lower, but the figures are too small for accurate assessment.

The overall incidence of pseudo-capsular exfoliation in Manx-born patients with glaucoma is 20/36, 55 per cent. of all patients. Glaucoma capsulare occurs predominantly in male patients in this series. The age incidence of Manx patients with glaucoma capsulare and chronic simple glaucoma is shown for males and females in the Figure. It can be seen that the greatest number of cases occurs in the 7th, 8th, and 9th decades.



In ten cases of capsular exfoliation occurring in Manx patients, the exfoliation was found in one eye only; two of these had had the other eye enucleated for thrombotic glaucoma, and in these pseudo-capsular exfoliation was found histologically. In a further four of these unilateral cases the other eye was thought to have sustained a thrombotic glaucoma after a preceding chronic simple glaucoma. In the remaining four cases of unilateral pseudo-capsular exfoliation the severity of the glaucoma was worse in the eye with the exfoliation.

In Manx patients a total of 62 eyes was found with either glaucoma capsulare or chronic simple glaucoma; thirty of these showed pseudo-exfoliation of the lens capsule.

Of a total of 32 eyes with pseudo-capsular exfoliation, capsular exfoliation was found on the pupil margin only in two phakic eyes, and the dandruff-like deposits could be seen only when the pupil was dilated in four eyes. Two eyes showed pigment deposits on the back of the cornea but no Krukenberg spindles were noted. Drainage surgery had been performed in ten eyes with pseudo-capsular exfoliation, but only two of these showed poor control of ocular tension postoperatively. Nine eyes had required cataract extraction.

Discussion

The features of pseudo-capsular exfoliation were first described by Vogt (1926), who reported twelve cases of dandruff-like deposits on the anterior lens capsule and pupil margin: in nine of these cases there was associated glaucoma. The cases seen in the present study correspond to those described by Vogt, in that dandruff-like deposits were seen on the pupil margin and anterior lens capsule in characteristic distribution.

The usual opinion is that the incidence of capsular exfoliation is low in England and the U.S.A., but high in Scandinavia.

The literature regarding the incidence of pseudo-capsular exfoliation in known cases of glaucoma is difficult to assess because different authors use different criteria for the diagnosis of glaucoma, and some do not state their diagnostic criteria at all. Garrow (1938) found eight out of 51 cases of glaucoma seen in Glasgow, an incidence of pseudo-capsular exfoliation of 16 per cent.

Holst (1947) found 375 cases of capsular exfoliation out of 459 cases of glaucoma in Norway. Thomassen (1949) found only one eye with capsular exfoliation among fifty eyes with glaucoma in London, but there were 45 eyes with glaucoma capsulare among 77 eyes with the same type of glaucoma seen in Oslo. Lemoine (1950) found only 29 out of 816 patients with glaucoma seen in Massachusetts. Smith (1958) included glaucoma capsulare among the secondary glaucomas, and found only 38 patients with secondary glaucomas among 506 seen in London, and later (Smith, 1965) stated that the form of glaucoma associated with pseudo-exfoliation of the lens is found in less than 2 per cent. of glaucoma cases in London. However, Hørven (1966) found an incidence of 28 per cent. in a specially selected group of patients over the age of 60 years attending a glaucoma consultative service in Massachusetts.

If the patients seen by Thomassen in London are comparable with those seen in this study, then the difference in incidence is statistically significant. It will be recalled that Thomassen found one eye with pseudo-capsular exfoliation among fifty with glaucoma, while in this study thirty eyes with capsular exfoliation were found among 62 with glaucoma ($\chi^2 = 27$; $P < 0.01$). Again, if the patients seen by Garrow are comparable with those seen by me in the Isle of Man, the difference in incidence is significant; Garrow found eight cases of pseudo-exfoliation among 51 cases of glaucoma in Glasgow, while the present author found no less than twenty patients with pseudo-capsular exfoliation among 36 cases of glaucoma ($\chi^2 = 13$; $P < 0.01$).

There would appear to be no doubt that pseudo-capsular exfoliation is uncommon among the glaucoma population of London, and much more frequent among the glaucoma population of Norway. The finding that twenty cases of pseudo-capsular exfoliation occurred in 36 Manx-born patients with all forms of glaucoma differs so radically from the London figures that it would appear that glaucoma capsulare occurs more commonly in Manxmen than in Londoners.

As male patients form the bulk of the Manx glaucoma cases, it is significant that pseudo-capsular exfoliation was found in 74 per cent. of 23 males. The fact that pseudo-capsular exfoliation occurs more commonly in males in this series agrees with the report of Sugar (1964), who found an incidence of 70 per cent. in his series.

Conclusions

- (1) Among Manx-born patients glaucoma capsulare was found in 55 per cent. of cases of all forms of glaucoma.
- (2) In male Manx patients the incidence of glaucoma capsulare is 74 per cent. of glaucoma cases.
- (3) In Manx patients glaucoma capsulare occurred predominantly in males.
- (4) It is suggested that the high incidence of pseudo-capsular exfoliation is related to the Scandinavian ancestry of the population.

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REFERENCES

- GARROW, A. (1938). *Brit. J. Ophthalm.*, **22**, 214.
HOLST, J. C. (1947). *Amer. J. Ophthalm.*, **30**, 1267.
HØRVEN, I. (1966). *Arch. Ophthalm. (Chicago)*, **76**, 505.
LEMOINE, A. N. (1950). *Amer. J. Ophthalm.*, **33**, 1353.
SMITH, R. (1958). *Trans. ophthalm. Soc. U.K.*, **78**, 245.
——— (1965). "Clinical Glaucoma", 1st ed., p. 9. Cassell, London.
SUGAR, H. S. (1964). In "Modern Ophthalmology", ed. A. Sorsby, 1st ed., vol. 4, p. 586. Butterworth, London.
THOMASSEN, T. L. (1949). *Acta ophthalm. (Kbh.)*, **27**, 423.
VOGT, A. (1926). *Schweiz. med. Wschr.*, **7**, 413 (Vol. 56 of Correspondence Section).