

Incidence of loss of vision in the healthy eye in amblyopia

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SUMMARY In Finland during the 20-year period 1958-78 35 patients with amblyopia lost the vision of the healthy eye. In more than 50% the cause was traumatic. The incidence of the loss of the healthy eye was 1.75 ± 0.30 per thousand. During the same period in Finland the overall blindness rate of children was 0.11 per thousand and of adults aged 15-64 years 0.66 per thousand. For the amblyopic patient the risk of becoming blind is markedly higher than for the general population.

It is generally thought that amblyopia affects about 2% of the untreated population. In 2 studies of normal Finnish schoolchildren the frequency of amblyopia ranged between 1.8 and 1.2%.^{1,2} In many countries much effort and time have been given to the detection and treatment of amblyopia. The result has been discussions on the significance of the treatment of amblyopia in childhood for the patient's later life in general.

Information about the proportion of patients who later lose the vision in their healthy eye is required to clarify the significance of treatment of childhood amblyopia. In particular this information is needed to evaluate its significance for amblyopic children in whom binocular vision is not to be expected despite treatment or in whom the vision achieved by treatment is quickly lost.³ To elucidate this matter data were collected on all amblyopic patients who during the last 20 years received pleoptic treatment at the Helsinki University Eye Hospital for loss of vision or for impending blindness in their healthy eye. On the basis of these data the incidence of loss of vision in the healthy eye and the main causes can be assessed in Finland. For the major part of the observation period the Pleoptic Clinic of this hospital has been the only one giving exhaustive pleoptic treatments in Finland. Annually at least 160 patients have received extensive pleoptic treatment.

Material and methods

The material consists of all amblyopic patients, totalling 23, who during the last 20 years received

pleoptic treatment for loss of vision in their healthy eye or for impending blindness at the Helsinki University Eye Hospital. Their ages ranged from 8 to 72 years (mean 30.5 years). Their age distribution was as follows: 8-20 years, 8 patients; 21-40 years, 8 patients; 41-60 years, 6 patients; over 60 years, 1 patient.

The occupations of the patients were as follows: 5 schoolchildren, 2 farmers, 2 cooks, and 1 transport superintendent, dock worker, telephone operator, painter, truck handyman, worker, lumberer, insulator, student, master mechanic, car mechanic, office manager, executive, and pensioner (a married woman).

The geographical distribution of the patients in Finland is illustrated in Fig. 1. The great majority came from the Helsinki area, which contains more than a half the population of the country.

The causes for the loss of the healthy eye were as follows. *Trauma*: accident at work, 6; sport or play injury, 3; blow (violence), 3; other, 2; total, 14. *Disease*: tumour, 3; uveitis, 1; vascular occlusion, 2; glaucoma, 1; intraocular haemorrhage, 1; retinal detachment, 1; total, 9.

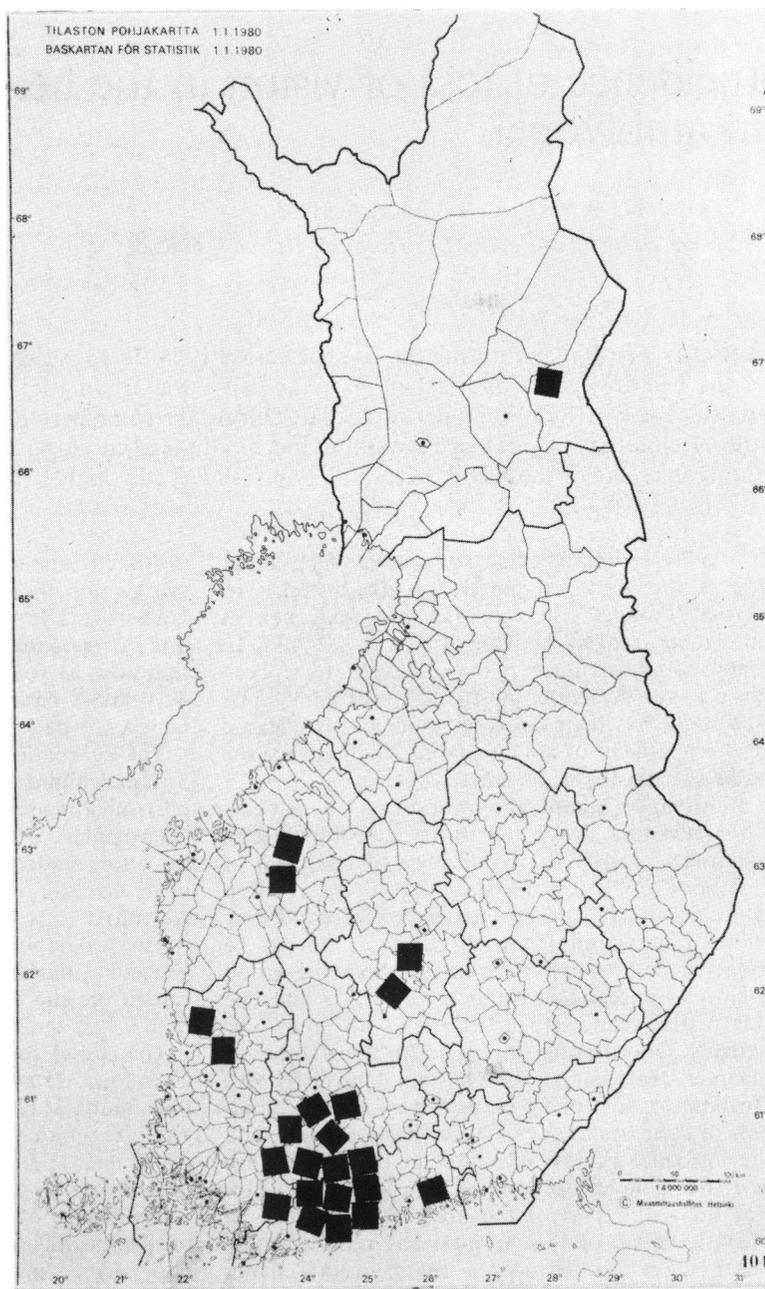
The degree of loss of vision was as follows: loss of the healthy eye (enucleation), 6; permanently poor acuity in the healthy eye, 11; impending blindness in the healthy eye, 6.

FREQUENCY OF LOSS OF HEALTHY EYE

Finland has about 4.5 million inhabitants, and about 60 000 babies are born annually. The frequency of amblyopia has been estimated to be 1.8% of 7-year-old normal Finnish schoolchildren.¹ This age group has been found to have the highest frequency of amblyopia.⁴ Thus about 1100 children

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Fig. 1 *Domiciles of 23 amblyopic patients with loss of vision in the healthy eye.*



with amblyopia a year and 22 000 in 20 years are born. These children, if left untreated, will develop amblyopia. On the basis of the population distribution in Finland and the domicile of the present subjects it was estimated that the present series contains about two-thirds of the total who have lost vision in their healthy eye. Accordingly, during a corresponding period persons with this loss would

number 35 out of 22 000 in Finland, the incidence being 1.75 ± 0.30 per thousand.

Discussion

The smallness of the present series does not allow very definite conclusions. Nevertheless it helps considerably in answering the question: How often

do amblyopic patients lose vision in their healthy eye? The data also provide information about the mechanisms involved in losing vision. The literature contains little information on these matters.

Loss of vision is evenly distributed among all age groups. The present series, however, contained no children under school age, which may be due to the fact that at that age the loss of vision in the healthy eye may quickly lead to a spontaneous improvement of amblyopia. Schoolchildren appear to be over-represented, but otherwise the occupational distribution is very even, reflecting well the degree of industrial development in Finland.

The loss of vision in the healthy eye was more often due to accident than to disease. The most common type of accident, as expected, was accident at work. In our series the distribution of diseases was quite even, though tumours appeared to be the commonest disease leading to loss of vision in the healthy eye. This observation raises important implications for employment. In addition amblyopic patients should be informed of the risk factors and the need of protective measures in the personal eye care.

For comparison it may be mentioned that in Finland the overall blindness rate is $7.9/10\,000 = 0.79/1000$,⁵ the frequency of blindness among children being $0.11/1000$ and among those aged 15 to 64 years $0.66/1000$. Since the frequency of loss or impending loss of vision in the healthy eye of amblyopic patients is $1.75 \pm 0.30/1000$, it can be concluded that for the amblyopic patient the risk of becoming blind is considerably higher than for the general population in Finland. Hence continued efforts for the early detection and treatment of amblyopia are justified.

References

- 1 Rantanen A, Tommila V. Prevalence of strabismus in Finland. *Acta Ophthalmol (Kbh)* 1971; **49**: 506–7.
- 2 Laatikainen L, Erkkilä H. Refractive errors and other ocular findings in school children. *Acta Ophthalmol (Kbh)* 1980; **58**: 129–36.
- 3 Burian HM, von Noorden GK. *Binocular Vision and Ocular Motility: Theory and Management of Strabismus*. Saint Louis: Mosby, 1974: 429.
- 4 Frandsen AD. Occurrence of squint. *Acta Ophthalmol (Kbh)* 1960; suppl 62.
- 5 Vannas S, Raivio T. Occurrence and cause of blindness in Finland. *Acta Ophthalmol (Kbh)* 1964; **42**: 489–94.