

Editorial: Incidence or Prevalence

The methods of conducting the early surveys of glaucoma¹⁻⁴ tended to vary, and few were true population studies. In the Cleveland study,² for example, a large number of persons had their pressures measured on a single 'glaucoma day,' while in Birmingham¹ a sample of 10 000 was aimed at by advertising in newspapers and at places of work. At Bedford¹ the subjects were volunteers who did not form a random sample of the population, while at Oxford¹ subjects were partly patients and relatives attending hospital for non-ocular complaints and partly Services personnel. At Ferndale,¹ however, a determined effort was made to assess the whole population between the ages of 40 and 75 of three villages in the Rhondda Valley, and Stromberg's⁵ survey covered the whole population over the age of 40 years in the Swedish town of Skovde.

Most of the surveys tended to concentrate on tonometry, and indeed some of them were designed to measure only pressure without necessarily looking deeply into the other features of glaucoma. Primary glaucoma was found to occur in from 0.43% of subjects over the age of 40 to 2.9% in the various published studies. This variability probably relates to some extent to sampling methods but more likely to varying diagnostic criteria. For example, Reed and Bendor-Samuel³ included 17 patients with 'normal' visual fields and six with 'poor co-operation' on field testing but only seven with definite glaucomatous defects in their 30 cases. Their prevalence rate was 2.9%. However, in the Ferndale survey much stricter criteria were employed, and the rate there was only 0.43%.

It has to be remembered that in the 1950s and 1960s routine tonometry was not usually done. Although tonometry is now routine in ordinary ophthalmological examinations, visual field screening is not, though it is likely that careful ophthalmoscopy by a well trained observer is still probably one of the surest methods of detecting glaucoma. But I am wandering off the point I wished to make concerning these early surveys, namely, that they were all, in effect, studies of the prevalence not the incidence of the disease. To those well versed in statistics the two words prevalence and incidence mean different things. I suspect that many clinicians, myself included I regret to have to admit, tend to think of the words as more or less synonymous and do not take much notice of the difference.

This difference is clearly explained in the paper by Bengtsson in the present issue. Prevalence is the

proportion of the population affected at a single point in time, whereas incidence is the proportion becoming affected during a defined period, usually one year. It follows that in self-limiting diseases with a short course annual incidence will probably be greater than prevalence. With an average duration of a year incidence will equal prevalence; while, in diseases that are permanent once contracted, prevalence will depend on the age at which the disease is usually acquired, but will certainly be greater than annual incidence. Bengtsson's study has elements both of a study of prevalence and of incidence. The first survey of the defined population is of necessity one of prevalence. This is followed at intervals of a few years by two further surveys on the same subjects (due allowance being made for the inevitable losses from the original muster), thus enabling the incidence to be determined, since cases detected at the second and third surveys were 'new' cases. The results of this part of the study led to the conclusion that the incidence of manifest glaucoma is 0.24 per annum. Incidentally it should also be noted that the surveys all included routine automatic perimetry, and it was on the perimetric evidence that the diagnosis was firmly based.

It is much more difficult than it might appear at first sight to relate this incidence rate to the sort of prevalence figures we are used to reading about, which as noted above may vary between wide limits averaging perhaps somewhere around 1%. One has to realise that in an extended investigation of this type all sorts of statistical problems arise. Although the same subjects are being studied each time, the composition of each group is quite different because of losses and aging. (The author has done his best to compensate for these difficulties, but it inevitably makes the presentation hard to follow.) Twenty-six cases were found in the intervals between the surveys, giving the average incidence of 0.24% per annum. An average duration of say 10 years would lead to a prevalence rate of 2.4%, which is somewhat on the high side. One has little doubt that the author, whose records seem very detailed, could work out an exact prevalence rate if he wished to, though that is not his primary purpose in presenting this material.

One feels that the chief interest in the paper lies in the final analysis of the total of glaucomatous individuals in the study, combining those from the first prevalence survey (15) (plus three discovered incidentally) with the 26 in the incidence survey, to give a grand total of 44. It is assumed that

the proportions of males and females and the geographical location of cases would be similar in incidence or prevalence surveys, hence the inclusion of the whole 44.

The findings as a result of this are very strange. The female to male ratio is about 2.5-1.0 quite different from findings in all other studies, and the geographical findings are unexpected also, many more cases being found in the 'countryside' than in villages (though 'countryside' is not defined). One is completely baffled by the latter finding, but there is a possibility that the sex distribution could have been influenced by mixing the figures for incidence with those for prevalence. In incidence studies, as explained above, diseases with a short duration are likely to predominate. Now chronic open-angle cases are 'always with us,' whereas successfully treated angle-closure cases are in effect cured, so that angle closure can be considered a disease of short duration. Therefore angle closure will, as was indeed shown in a study in 1958,⁶ figure more prominently in a study of incidence and, because of the sex distribution of angle closure (females outnumber males by 3 to 1) will tend to alter the sex ratio. It is possible, therefore, that some

cases of angle closure might have been included in Bengtsson's study, and this might have contributed to the surprising sex distribution. However, it is most unlikely to be the complete answer and certainly does nothing to explain the geographical peculiarities. Further studies on this population are awaited with interest.

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References

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