Incidence of blindness due to diabetic eye disease in Fife 1990–9

T G M Cormack, B Grant, M J Macdonald, J Steel, I W Campbell

Abstract

Aims—In the light of goals for reducing blindness due to diabetes, published in the St Vincent Declaration, 1989, the aim of this study was to find the incidence and prevalence of blindness in the diabetic population of Fife.

Methods—All blind registrations for the period 1990–9 were studied. Those with diabetes as the first or main diagnosis were included as new diabetic blind. The prevalence of diabetes was studied in a large sample population and extrapolated to the estimated population of Fife.

Results—The incidence of blindness due to diabetes was 64 (SD 24, 95% CI 49–79) per 100 000 diabetic population/year. The point prevalence of blindness due to diabetes on 31 December 1999 was 210 per 100 000 diabetic population.

Conclusion—The incidence of blindness due to diabetes, in a diabetic population, is now known. Without this benchmark it is impossible to assess the implementation of the St Vincent Declaration.


The incidence of diabetes mellitus, especially type 2, is increasing worldwide.1 Diabetic eye disease is the commonest cause of visual loss in adults of working age in the UK.2,3 Around 50% of severe visual impairment is preventable when considering proliferative retinopathy,4,5 and centrally localised macular oedema.6,7 In 1989 the World Health Organization and the European Regional Committee of the International Diabetes Federation held a joint meeting in St Vincent, Italy. The meeting suggested many ways of improving the care of people with diabetes including aims for reducing complications. These were published as the St Vincent Declaration. The target for ophthalmology was to reduce new blindness due to diabetes by one third or more within 5 years.8

The incidence of blindness or severe visual impairment in a diabetic population is unknown in the UK.9 Social work departments (or agencies) in the UK keep records of all people legally registered blind in their region.

The objectives of this study were to
(1) determine the incidence of blind registration due to diabetes in Fife 1990–9
(2) express this incidence in terms of the total population and the diabetic population
(3) determine the point prevalence of blind registration due to diabetes on the last day of the study period (31 December 1999).

Methods

All blind registrations in Fife are lodged with a single agency, Fife Society for the Blind. The World Health Organization definition of blindness includes individuals with less than 3/60 best corrected visual acuity in the better eye. Also included are those with no greater than 10 degrees of visual field around central fixation (even if central acuity is not impaired).10 The guidelines for blind registration in Scotland (which apply in Fife) are shown in Table 1.11

Between 1990 and 1999, the forms of all newly registered patients were examined annually by a research nurse to determine the cause of visual loss. In any case where the cause was not clearly stated on the registration form, a review of the medical records by the research nurse (BG) was undertaken. If the main pathology remained unclear, the medical records were examined by a consultant ophthalmologist (MJM). All cases of diabetic retinopathy and/or maculopathy as the main or only cause of blind registration were included in this study. Diabetics who were registered blind with any other cause were not included in this study. The other causes of blindness were not considered directly related to diabetes.

The annual population estimates supplied by the General Register Office for Scotland were used.12 All diabetics already on the blind register at the start of the study period were identified and included in the point prevalence calculation. All deaths of those registered blind are notified to Fife Society for the Blind. The point prevalence of blindness due to diabetes, on the last day of the study, was calculated excluding those who had died.

Eighteen general medical practices in Fife with a representative population of 132 262 have a comprehensive diabetic register. The registers included all types of diabetics and was analysed in July 1997. This sample population represented more than one third of the population of Fife. The prevalence of diabetes was extrapolated to the whole population of Fife to estimate the diabetic population of Fife. This percentage rate was used as an assumed rate for the whole study period as no previous information was available earlier in the study period.

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Table 1 Definition for blind registration in Scotland

<table>
<thead>
<tr>
<th>Legal definition of blindness—Scotland</th>
</tr>
</thead>
<tbody>
<tr>
<td>“So blind as to be unable to perform any work for which eyesight is essential”</td>
</tr>
<tr>
<td>Which is recommended to be</td>
</tr>
<tr>
<td>—Below 3/60 best corrected visual acuity in the better eye</td>
</tr>
<tr>
<td>—3/60 but below 6/60 best corrected visual acuity and considerably contracted visual field</td>
</tr>
<tr>
<td>—6/60 or more best corrected visual acuity and markedly contracted visual field “in the greater part of its extent and particularly if the contraction is in the lower part of the field”</td>
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### Table 2. Blind registration due to diabetes, estimated population, and estimated diabetic population of Fife 1990–9

<table>
<thead>
<tr>
<th>Year</th>
<th>Blind registrations</th>
<th>Population of Fife</th>
<th>Diabetic population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>6</td>
<td>348 800</td>
<td>6669</td>
</tr>
<tr>
<td>1991</td>
<td>6</td>
<td>349 400</td>
<td>6680</td>
</tr>
<tr>
<td>1992</td>
<td>2</td>
<td>349 900</td>
<td>6690</td>
</tr>
<tr>
<td>1993</td>
<td>3</td>
<td>351 200</td>
<td>6715</td>
</tr>
<tr>
<td>1994</td>
<td>3</td>
<td>352 100</td>
<td>6732</td>
</tr>
<tr>
<td>1995</td>
<td>7</td>
<td>351 600</td>
<td>6761</td>
</tr>
<tr>
<td>1996</td>
<td>5</td>
<td>349 300</td>
<td>6790</td>
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<tr>
<td>1997</td>
<td>4</td>
<td>348 400</td>
<td>6661</td>
</tr>
<tr>
<td>1998</td>
<td>4</td>
<td>349 900</td>
<td>6627</td>
</tr>
<tr>
<td>1999</td>
<td>3</td>
<td>348 200</td>
<td>6585</td>
</tr>
</tbody>
</table>

**Results**

In all, 1.912% of a representative sample population within Fife were found to be diabetic (2529 diabetics out of 132 262 patients in 18 GP practices). The number of blind registrations, the population estimates, and the diabetic population estimates for each year of the study are shown in Table 2. The average number of blind registrations due to diabetes per year in Fife was 4.3 (SD 1.6, 95% CI 3.3–5.3).

The incidence of blind registrations due to diabetes was 210 per 100 000 diabetic population/year. The incidence of blind registrations due to diabetes was 64 (24, 49–79) per 100 000 diabetic population/year. Fourteen diabetics in Fife were registered blind due to diabetes and alive on 31 December 1999. The point prevalence of blind registration due to diabetes was 4.9 per 100 000 total population/year (31 December 1999). The point prevalence of blind registration due to diabetes was 210 per 100 000 diabetic population (31 December 1999).

**Discussion**

Figures for the incidence of diabetic blindness in a diabetic population are difficult to obtain. In the Avon study, the incidence of blindness (less than 3/60 in better eye or severe field loss) due to diabetes was 1.2 (0.47, 0.9–1.5) per 100 000 total population/year. The incidence of blind registrations due to diabetes was 64 (24, 49–79) per 100 000 diabetic population/year. The raw figures for incidence of new registrations each year reveal that the number registered blind per year has not changed markedly during the study period (Table 2). Our rate of 1.912% of the population diagnosed with diabetes mellitus is higher than a previously published rate of 1.2% but considerably lower than two other recently published rates of 3.3% and 3.2%. The authors would like to mention that although the rate may be an underrepresentation of the true prevalence, it was the prevalence of known diabetes locally.

Although we have the partial sight registration data over this time scale, they were excluded from this study for three reasons:

1. Partial sight registration has no legal definition
2. Different clinicians have very different criteria for partial sight registration
3. The St Vincent Declaration does not mention partial sight.
We plan to repeat this study after a further 10 years and to pursue a separate, ongoing audit programme on the prevention of blindness due to diabetes.17

Conclusions
Identification of the rate at which diabetics are registered blind (64 (SD 24) per 100 000/year) is the most important result of this study. A measured incidence of blindness (WHO definition) in a known diabetic population has never previously been published. Without this benchmark it is impossible to assess attempts at implementing the St Vincent Declaration.

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