

Prevalence of multiple sclerosis in a south London borough

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Abstract

A survey of multiple sclerosis in the London Borough of Sutton, population 169 600, yielded 195 cases, giving an overall prevalence of 115/100 000. This is the third highest prevalence for a first survey of a geographical area in the United Kingdom, exceeded only by 127/100 000 in north east Scotland and 134/100 000 in Shetland. On the classification system of Allison and Millar, three quarters of the cases were classified as probable multiple sclerosis, 15% as early probable and latent multiple sclerosis, and 10% as possible multiple sclerosis. The mean age was 49 years, the mean age at onset was 34 years, and the mean duration of the disease was 15.4 years. The age standardised female to male ratio was 2:1.

The prevalence found in this survey does not differ significantly from that recorded in the first north east Scotland survey.

This study suggests that, firstly, the prevalence of multiple sclerosis in south east England is probably about 100/100 000 and, secondly, the latitudinal effect on the prevalence of multiple sclerosis in the United Kingdom is less appreciable than previously believed.

Introduction

In the United Kingdom all major epidemiological surveys of multiple sclerosis have been carried out in the north of England, Northern Ireland, or Scotland,^{1,9} and indeed Scotland has been surveyed more often than any other place in the world. A survey in Cornwall has been the only attempt to measure prevalence in the south of England.¹⁰ Table I summarises the main United Kingdom surveys and illustrates three points that are helpful in interpreting prevalence studies. Firstly, more recent surveys tend to show higher prevalences than do earlier surveys.¹¹ For example, northern Scotland, studied in the early 1950s, recorded a prevalence of 67/100 000,³ whereas a study of north east Scotland two decades later produced a prevalence in excess of 120/100 000.⁷ This increased prevalence over time was partly attributed to the better methods of ascertaining cases used in later surveys and also to longer survival times.¹¹ Secondly, repeated surveys of the same geographical area consistently produce higher prevalences with each subsequent survey.¹¹ Table I shows that surveys of north east Scotland produced a 40% rise in prevalence over three surveys⁷⁻¹⁰ and Orkney a threefold increase in prevalence over four surveys.^{3,5,6} Thirdly, surveys of places with very small populations, like Orkney and Shetland, yield results of low precision.¹² In the first Shetland survey, for example, the 95% confidence limits ranged from 81 to 185/100 000.

As there is so little information about prevalence in the south of England, the most populated part of the United Kingdom, the prevalence for the United Kingdom is unknown, although it is generally accepted to be over 30-40/100 000.⁹ The prevalence in England is usually assumed to be lower than that in Scotland as the prevalence in the south is thought to be lower than that reported in

the north.¹³ The aim of this survey was to measure the age and sex specific prevalence for multiple sclerosis in the London Borough of Sutton, in south east England.

Patients and methods

AREA

The London Borough of Sutton covers 43 km² and is 51° north of the equator. The mid-year population estimate for Sutton in 1984 was 169 600.¹⁴ Over the past three decades the size of the population has remained virtually constant. Sutton contains a higher proportion of people in social classes I and II than the national norm, and 47% of the population are in non-manual occupations, compared with 33% for Great Britain.¹⁴ Sixteen per cent of the population are aged over 65 and 4% were born in the new Commonwealth or Pakistan. The area is suburban and served by roughly 80 general practitioners. Most patients with neurological conditions are seen by one neurologist (RMCK) at St Helier or Atkinson Morley's hospitals, although some attend hospitals in inner London.

TABLE I—Summary of United Kingdom prevalence surveys of multiple sclerosis: 1950-80

Area	Year of survey	Surveyed population	Cases	Crude prevalence/100 000 (95% confidence intervals)	Standardised prevalence ratio*
Northern Ireland ^{1,2}	1951	1 370 709	700	51 (47 to 55)	62
	1961	1 425 042	1158	81 (77 to 86)	100
North Scotland ³	1954	231 116	154	67 (56 to 77)	76
	1958	338 770	214	63 (54 to 72)	68
Durham and Northumberland ⁴	1959	2 308 000	1156	50 (47 to 53)	56
	1954	20 746	23	111 (65 to 156)	124
Orkney ^{3,5,6}	1962	18 531	33	178 (117 to 239)	200
	1970	17 077	40	234 (161 to 307)	284
	1974	17 462	54	309 (227 to 391)	384
	1974	18 715	25	134 (81 to 185)	142
Shetland ^{3,5,6}	1962	17 537	29	165 (105 to 226)	184
	1970	17 327	31	179 (116 to 242)	216
	1974	18 445	34	184 (122 to 246)	237
North east Scotland ⁷⁻⁹	1970	440 176	557	127 (116 to 137)	153
	1973	440 227	634	144 (133 to 155)	175
	1980	471 000	839	178 (165 to 190)	221

*Calculated using 1961 Northern Ireland age specific prevalence.

METHOD

Having obtained approval from the local ethical committee, we used six sources to draw up a provisional nominal list of identified cases of multiple sclerosis. The social services department and the local branch of the Multiple Sclerosis Society provided names for the provisional list. All general practitioners in the borough were asked to supply information either by telephone or by letter. The department of neurology at Atkinson Morley's and St Helier hospitals searched through case notes and also provided a list of patients who had had a visual evoked response investigation in the previous three years. Community nurses provided a list of patients. The South West and South East Thames Regional Health Authorities and the National Hospital for Nervous Diseases made a computer search for Sutton residents discharged from hospital with any mention of multiple sclerosis in the previous 10 years.

Patients' names were included on the list if they had been labelled as having multiple sclerosis by any one of the six sources of ascertainment, and also if they were usually resident in Sutton on the day prevalence was calculated. Patients in long term residential care whose usual address was Sutton were admitted to the list. The 1981 London Borough of Sutton street index was used to verify an address as being within the survey area.

Clinical information on all 217 patients on the provisional list was extracted from 183 hospital case notes and 34 general practitioners' records. From this information patients were classified by the neurologist (RMCK)

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into diagnostic groups using the classification system of Allison and Millar of probable multiple sclerosis, early probable and latent multiple sclerosis, and possible multiple sclerosis.¹ The Allison and Millar classification was used to allow comparisons with previous United Kingdom surveys.^{1,2,4,7,8}

We calculated a standardised prevalence ratio to take account of differences in age among the surveyed populations presented in table I. As age specific rates are not generally available an indirect method was applied, using the age specific rates from the 1961 Northern Ireland survey.²

Results

The Sutton branch of the Multiple Sclerosis Society provided an up to date list of 132 members, of whom 91 were eligible for inclusion in the provisional list. The social services identified 169 clients with diagnosed multiple sclerosis from their handicap register, of whom 110 qualified for inclusion. Of the 80 general practitioners practising in the borough, 67 (84%) responded, identifying 71 eligible patients. The community nursing service identified 63 patients, and the hospital provided 119 eligible names. Hospital Activity Analysis data produced 77 eligible patients. The provisional nominal list prepared from the data gathered contained 217 names. Of these, 67 were identified by only one source—that is, 42 by the hospital, 10 by general practitioners, 10 by Hospital Activity Analysis, two by community nurses, two by social services, and one by the Multiple Sclerosis Society. Forty seven patients were identified by two sources, 43 by three sources, and 60 by four or more sources.

The greatest number of cases was yielded by hospitals and social services, identifying 130 (60%) and 122 (56%) respectively; together they yielded 193 (89%) of the cases. Hospitals and general practitioners together yielded 171 (79%) of the cases. During the classification stage of the survey 22 patients were excluded—nine because of a wrong address, eight with a wrong diagnosis, and five who had died.

On the day prevalence was calculated, 1 January 1985, 195 people with multiple sclerosis were usually resident in Sutton, including six patients in long term care. The overall prevalence was 115/100 000 population; the prevalence for the different diagnostic groups is shown in table II. The age standardised ratio of women to men was 2:1. Table III shows the age specific rates; rates for women were higher in all age groups over 25 years, and the highest rate for both men and women, 146 and 343/100 000 respectively, occurred in the 45-54 age group.

The age range of patients was 20-82 years, with a mean of 49 (SD 14.4); the mean age for women was 50 (14.7) and for men 46.4 (13.4). Table V shows the age and year of onset of multiple sclerosis. The mean age at onset was 34.1 years (10.5) (range 14-61) for the whole group, 33.7 (10.9) for women, and 34.8 (9.6) for men.

The mean duration of disease from onset to day of prevalence for both sexes was 15.4 years (11.0), for women 16.7 years (11.0), and for men 12.2 years (9.9). The longest recorded duration was 52 years; 29 (25%) women and 7 (6%) men had had multiple sclerosis for more than 25 years.

TABLE II—Prevalence of multiple sclerosis in London Borough of Sutton by diagnostic group and sex

Groups	No of patients (%)	Prevalence/100 000 (95% confidence intervals)
Probable multiple sclerosis	147 (75)	87 (73 to 100)
Early probable multiple sclerosis	29 (15)	17 (11 to 23)
Possible multiple sclerosis	19 (10)	11 (6 to 16)
All groups	195 (100)	115 (99 to 131)
Total men	60 (31)	74 (55 to 93)
Total women	135 (69)	152 (126 to 178)

TABLE III—Prevalence of multiple sclerosis per 100 000 population by age and sex in London Borough of Sutton*

Age group (years)	Men		Women		Total	
	No	Rate	No	Rate	No	Rate
15-24	3	24.8	2	15.9	5	20.2
25-34	8	65.6	22	177.4	30	121.9
35-44	16	135.6	28	241.7	44	189.1
45-54	14	145.8	35	343.4	49	246.2
55-64	12	130.4	24	235.3	36	185.6
65-74	6	100.0	17	200.0	23	158.6
≥75	1	24.4	7	82.4	8	63.5
All ages	60	74.2	135	152.0	195	115.0

*OPCS 1984 mid-year estimates used for age group denominators.

TABLE IV—Comparison of survey results: Sutton survey and first north east Scotland survey

	Sutton	North east Scotland
Reference population	169 600	440 176
Total cases	195	557
Overall prevalence/100 000 (95% confidence intervals)	115 (99 to 131)	127 (116 to 137)
Probable multiple sclerosis (%)	147 (75)	310 (56)
Early probable and latent multiple sclerosis (%)	29 (15)	154 (28)
Mean age	49.0	48.2
Mean duration	15.4	14.4
Mean age at onset	34.1	34.2
Mean annual incidence/100 000	5.0	5.3*
Proportion of women (%)	69	62
Standardised prevalence ratio† (95% confidence intervals)	129 (111 to 147)	153 (140 to 166)

*From second north east Scotland survey calculated from period 1959-73.

†Standardised prevalence ratio in Northern Ireland 1961 = 100.

TABLE V—Age at onset and year of onset of multiple sclerosis in 194* patients in Sutton

Age group (years)	No patients	Calendar year	No of patients
14-19	10	1931-3	1
20-24	29	1934-6	1
25-29	28	1937-9	0
30-34	27	1940-2	1
35-39	31	1943-5	3
40-44	28	1946-8	3
45-49	22	1949-51	5
50-54	13	1952-4	10
55-59	5	1955-7	8
60-64	1	1958-60	7
		1961-3	9
		1964-6	17
		1967-9	19
		1970-2	14
		1973-5	19
		1976-8	24
		1979-81	35
		1982-4	18

*Data missing in one case.

The estimated mean annual incidence for the nine years 1976-84 was 5/100 000 population. This arbitrary period was chosen because it yielded sufficient cases (77) to give a reasonably precise estimate of the annual mean number and yet was thought to be not too long to be seriously biased by cases lost to follow up through death and migration. A crude estimate of the mean duration from onset to death can be obtained by using Poskanzer's indirect method of doubling duration from onset to the day of prevalence⁶; in the present study this yielded an estimated mean duration from onset to death of 31 years.

Discussion

A crucial factor in epidemiological surveys of multiple sclerosis is complete and accurate ascertainment of cases. Incomplete ascertainment leads to underestimating the prevalence and, therefore, makes comparison between surveys difficult to interpret as observed differences may reflect incompleteness rather than real differences in prevalence. A key aspect of the design of epidemiological surveys of multiple sclerosis is the choice of a population at risk that yields an accurate estimate of true prevalence. Surveys of very large populations, such as Northern Ireland^{1,2} and Durham and Northumberland,⁴ are biased by incomplete ascertainment, whereas surveys of very small populations, such as those of Orkney and Shetland, are subject to the imprecision associated with a large sampling error.³ The population chosen for study should be a compromise between these two opposing sources of inaccuracy.

In this study the population was of a manageable size, allowing fairly detailed methods of ascertainment. The social service department and hospitals were the most successful sources and appeared to identify two different groups of cases. Hospital Activity Analysis data were found to be a valuable source and may form the starting point of future surveys in the United Kingdom. Standardising for

age confirmed the view of Poskanzer that differences in age structure have relatively little effect on observed differences between surveys.⁶

The overall prevalence of 115/100 000 is the third highest recorded for a first survey of an area in the United Kingdom, exceeded only by 127 in north east Scotland⁷ and 134 in Shetland.³ The Shetland prevalence, however, is subject to the imprecision caused by a large sampling error mentioned earlier. The method of ascertainment in the present survey, which used Hospital Activity Analysis data and social services information, differed widely from methods used in the earlier surveys of Northern Ireland, north Scotland, and Durham and Northumberland so that comparison was not worth while. The most valid comparison was with the first survey of north east Scotland, which also used detailed methods of ascertainment.

Table IV compares the main results of the two surveys. Overall prevalence was slightly but not significantly higher in north east Scotland; age standardisation, however, accentuated the difference. Mean age, mean age at onset of multiple sclerosis, mean duration, and estimated mean incidence were remarkably similar in the two surveys. Sutton had a higher percentage of women and more people with probable multiple sclerosis and fewer with early probable or latent multiple sclerosis. Classification bias may have accounted for some of the difference between diagnostic groups as different methods of classification were used; in north east Scotland 77% of patients were classified after a physical examination, whereas in Sutton patients were classified using information abstracted from medical records. The second and third surveys of north east Scotland produced prevalences of 144 and 178/100 000 respectively, which were significantly higher than the prevalence in Sutton. How much of these differences were due to the effect of repeated studies, however, is unclear.^{2,5,6,8,9}

Using a nine year average mean is a crude method for estimating incidence. It assumes no change in the disease over time and is biased by people lost to follow up through death and migration. Using data for the latest nine years probably provided sufficient cases for a reasonable estimate of incidence. Interestingly, the mean annual incidence in north east Scotland in 1973 (5.3) was similar to that of Sutton in 1984 (5.0).

In support of Limburg's hypothesis that the frequency of multiple sclerosis increases with the distance of the surveyed area from the equator,¹⁵ Acheson proposed the existence of a simple linear relation between prevalence and geographical latitude in Europe, prevalence being higher in the north and lower in the south.¹¹ A comparison of the prevalence in north Scotland and Cornwall produced in the 1950s, however, failed to show any significant north-south gradient. Moreover, the prevalence found in our survey suggests that the latitudinal effect in the United Kingdom may be less than is generally accepted. Moreover, in a household survey of disabled people in the London Borough of Kensington and Chelsea carried out under the Chronically Sick and

Disabled Persons Act during the early 1970s the number of people who reported their disability as caused by multiple sclerosis gave a prevalence of 130/100 000,¹⁶ which was similar to the prevalence recorded in Scotland.

We conclude that to date the evidence provided by United Kingdom surveys of a north-south gradient in prevalence is less than convincing. Although it is generally accepted that the United Kingdom has a relatively high prevalence, usually taken as over 30-40/100 000, on the basis of this survey the prevalence for south east England is around 100/100 000. This prevalence may well apply more widely in the United Kingdom, but to establish this supposition will require further investigation.

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SHORT REPORTS

Captopril in elderly patients with heart failure

There are many reports on captopril but few data on its use in the elderly. We report our experience with captopril in an open study of an elderly population with heart failure.

Patients, methods, and results

Thirty elderly patients (mean age 81.6 (range 71-92) years) with congestive cardiac failure that had not responded to frusemide 40-120 mg or its equivalent were recruited into an open 12 week study of captopril. Cardiac failure had been present for an average of 11.9 (0.5-48) months. Seventeen patients were New

York Heart Association class II, eight class III, and five class IV. Sixteen were in-patients at the start of the study, and 14 were outpatients.

Eighteen patients completed the study; the remaining 12 were withdrawn because of non-compliance (failure to take more than 80% of the tablets) (five patients), intractable heart failure that did not improve when they took captopril (two), death from cardiac infarction (one), death from respiratory failure (one), vertebrobasilar insufficiency (one), death from gastrointestinal haemorrhage (one), and disseminated carcinoma (one). Multiple disease is a feature of this age group, and the deaths were probably unrelated to the drug.

The cardiac output was measured by a computerised densitometer with a diachromatic earpiece¹ and was taken to be the mean of three values. The dye was injected rapidly into the antecubital vein. The first dose of captopril (6.25 mg) was administered orally and the patient monitored in the supine position for three hours. Captopril 6.25 mg twice daily was then taken until the next assessment, when the dose was increased to 25 mg twice daily for the next four weeks. Thereafter the dose was increased if the cardiac failure was not controlled. If there was evidence of fluid retention the diuretic dose was increased but reduced if