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Low back pain in eight areas of Britain

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Abstract

***Study objective*—The aim was to assess the geographical variation in low back pain and associated disability in Britain.**

***Design*—This was a cross sectional survey with information collected by postal questionnaire.**

***Setting*—General practices in seven British towns and one rural district.**

***Subjects*—1172 men and 1495 women aged 20–59 years were selected from the age-sex registers of 136 general practitioners in the study areas.**

***Main results*—The overall lifetime and one year period prevalences of low back pain were 58.3% and 36.1%. Rates in men and women were similar. Symptoms were more common in men with manual occupations than in those with non-manual jobs, but in women there was no clear trend in relation to social class. Geographical differences in prevalence were small, but the threshold for consulting general practitioners about symptoms varied markedly from place to place. After allowance for age, sex, social class, and severity of symptoms, subjects in the northern towns of Arbroath and Peterlee who had suffered from low back pain in the past year were three to four times as likely to have consulted their doctor about the problem as those living in the southern towns of St Austell and Dorking. Consultation rates in the Midlands were intermediate.**

***Conclusions*—Geographical variation in rates of general practice consultation for low back pain in Britain is due largely to differences in patient behaviour once symptoms have developed. The distribution of important causes of low back back pain across the country is probably fairly uniform.**

Low back disorders are a major source of disability, but their causes are poorly understood.[1] General practice surveys of morbidity in England and Wales have suggested marked regional variation in consultation for back symptoms. In a study carried out in 1955, annual consultation rates for all ages combined ranged from 1·33% in East Anglia to 2·60% in the South West.[2] In 1970–71 the range was from 2·90% in the East Midlands to 5·30% in the North.[3] A third survey in 1981 showed smaller differences, but in this analysis the country was only divided into three large regions.[4] Two more localised studies, one in the East Midlands[5] and one in Fife,[6] have also indicated major geographical variation in rates of consultation for low back pain.

If these geographical differences in consultation rates reflect real variation in incidence, they could provide an important clue to aetiology. On the other hand, they could be an artefact of differences in the threshold for seeking medical advice. To explore the geography of low back disorders further, we have carried out a survey of symptoms and associated disability in eight areas of Britain.

Methods

We studied seven towns and one rural district, chosen to give a broad geographical spread and to cover a wide range of industrial activities (figure). Their populations ranged from 17 000 to 35 000. From the age-sex registers of local general practitioners we selected a 5% random sample of men and women aged 20–59 years who were resident in the study areas.

Each subject was sent a postal questionnaire asking about low back symptoms and associated disability at any time in his or her life, and specifically in the past 12 months. Low back pain was defined as pain in an area (illustrated on a diagram) between the twelfth ribs and the gluteal folds, which lasted for more than 24 h and which was not associated exclusively with febrile illness, menstrual periods, or pregnancy. Subjects who reported low back pain were asked whether it had ever caused them to consult a general practitioner or take time off work, and whether it had ever made it difficult or impossible to carry out any of the eight activities listed in table I. From the latter we derived a disability score ranging from 0 (none of the activities ever difficult) to 16 (all of the activities at some time impossible). Social class was determined from most recent full time occupation or, in the case of married women, those of their husbands.

Non-responders were sent reminders after one month. Those who still failed to reply were sent an abbreviated questionnaire asking simply whether they had ever suffered from low back pain, and whether they had had low back pain during the past 12 months.

As a check on the validity of recent histories, we searched the general practice records of all subjects registered with 39 doctors in three areas—Dorking, Wisbech, and Peterlee.

Results

All but 10 of the 146 local general practitioners agreed to participate in the study, and from their

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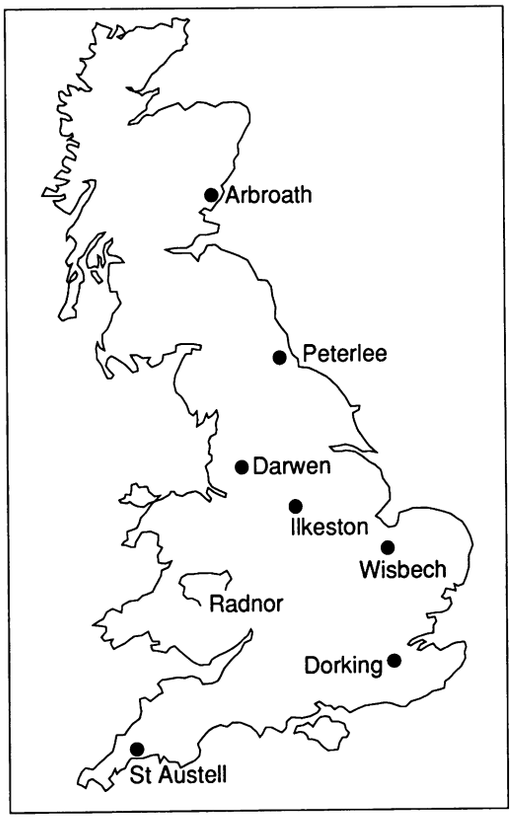

Places studied

lists we selected 4502 subjects. Full questionnaires were returned by 1172 men and 1495 women, an overall response rate of 59·2%. The response rate varied from 52·6% in Ilkeston to 63·0% in Dorking and 65·8% in Radnor. A further 525 (11·7%) subjects replied only to the short questionnaire sent at the third mailing. The non-responders included 410 subjects who had moved and could not be traced.

Among subjects who answered the full questionnaire the lifetime prevalence of low back pain was 58·3% and the one year period prevalence 36·1%. Corresponding rates in those who only completed the short questionnaire were 53·1% and 37·0%.

Table II shows the distribution of symptoms and disability by age and sex in subjects who answered the full questionnaire. As would be expected, lifetime prevalences tended to increase with age. Older subjects were also more likely to have suffered from low back pain during the past year, and to have consulted a general practitioner about the problem during this time. However, trends in disability over the past year were less marked. Differences between men and women were small, except that a higher proportion of men had needed time off work because of low back pain. This was partly because on average women had spent less time in employment.

After allowance for age, the prevalence of low back pain and associated disability was clearly related to social class in men, but not in women (table III). Over the past year, men in classes IV and V had consulted a doctor or taken time off work because of low back pain more than twice as often as men in classes I and II.

The age and sex standardised prevalence of low back pain by area is shown in table IV. Differences were generally small, lifetime prevalence ranging from 54·4% in St Austell to 61·9% in Wisbech, and one year period prevalence from 31·9% in Darwen to 39·7% in Wisbech. There was more variation, however, in rates of medical consultation. The proportion of subjects who had consulted a general practitioner for low back pain in the past year ranged from 8·3% in St Austell and 8·4% in Dorking to 18·3% in Arbroath and 23·5% in Peterlee.

We explored this variation further, using multiple logistic regression to examine determinants of medical consultation in subjects who had suffered from low back pain during the past year (table V). As well as being strongly related to disability score, consultation rates were higher in women than in men, and in social classes IV and V compared with classes I and II. In addition, there was a marked effect of area of residence, subjects from the north being more likely to consult a doctor than those living in the south. After allowance for age, sex, social class, and disability, low back pain sufferers in Peterlee and Arbroath were three to four times more likely to seek advice from their general practitioner than those living in St Austell and Dorking.

Examination of general practice records in Dorking, Wisbech, and Peterlee showed a similar one year prevalence of consultation for low back pain in subjects who had answered the first questionnaire (8·7%) to that in non-responders (9·6%). Histories of consultation were confirmed for 44 of 95 subjects who reported that they had seen their general practitioner about low back pain within the past year and whose notes were

Table I Subjects were asked how their low back pain had affected eight activities. Each activity was scored 0 (no difficulty), 1 (difficult), or 2 (impossible), and the scores were summed. The activities examined are listed

Walking around the house
Standing for 15 min or longer
Getting up from a low chair
Getting out of a bath
Getting in and out of a car
Going up and down stairs
Putting on socks, stockings, or tights
Cutting toenails

Table II Lifetime and one year period prevalence (%) of low back pain and resultant disability by age and sex

		Men (years)				*Women (years)*			
		20–29 (n=294)	*30–39 (n=326)*	*40–49 (n=288)*	*50–59 (n=264)*	*20–29 (n=378)*	*30–39 (n=429)*	*40–49 (n=366)*	*50–59 (n=322)*
All low back pain	Lifetime	52·0	60·4	64·2	70·5	45·2	53·8	62·3	63·7
	One year	35·4	37·1	38·2	40·5	27·0	33·6	43·7	35·7
Low back pain making it impossible to put on socks, stockings, or tights	Lifetime	6·5	10·1	16·7	16·7	5·3	10·7	13·1	12·7
	One year	3·7	4·0	3·8	3·8	2·1	3·3	3·3	3·4
Low back pain associated with disability score ≥9	Lifetime	8·2	12·6	20·8	23·1	7·7	13·1	16·4	15·8
	One year	4·1	5·8	6·6	5·3	2·1	4·7	5·7	5·6
Low back pain leading to consultation with general practitioner	Lifetime	24·8	39·3	47·6	55·7	28·0	34·0	49·2	49·1
	One year	11·6	14·1	13·2	18·6	12·4	11·4	19·1	16·8
Low back pain leading to time off work	Lifetime	22·4	31·3	38·2	46·2	16·9	18·4	29·8	29·8
	One year	9·5	13·5	9·4	9·5	6·1	5·1	9·8	6·5

available for examination, the rate of confirmation in Peterlee (23 of 45) being similar to that in Dorking (four of 10) and Wisbech (17 of 40). Seventeen subjects (including eight in Peterlee) had failed to report a documented consultation.

Discussion

Our data confirm the high prevalence of low back pain and associated disability in the general population. Symptoms were more common in men with manual occupations than in those with non-manual jobs, but in women there was no clear trend in relation to social class. Geographical differences in prevalance were small, but the threshold for reporting symptoms to general practitioners varied markedly from place to place.

The questionnaire which we employed was based on that used in a earlier study,[7] and developed specifically for use in postal surveys. We attempted to gauge the severity of symptoms by asking about disability for everyday activities. These were chosen to be clearly defined and applicable to the majority of subjects. Of the individual activities examined, putting on socks and cutting toenails most often gave rise to difficulty, but there was a tendency for all of the disabilities to correlate.

The validity of reported symptoms could not be tested directly because there was no reliable standard against which they could be assessed. We have, however, examined the repeatability of data obtained by our questionnaire. When we compared histories obtained from 225 men and women on two occasions at an interval of 12 months, we found good agreement on whether subjects had ever suffered from low back pain or consulted a general practitioner because of the problem.[8] Lifetime histories of disability for everyday activities were less reproducible. However, the strong relation between disability score and medical consultation for low back pain during the 12 months before completion of the questionnaire (table V) suggests that reports of recent disability were reasonably valid.

The refusal of a minority of general practitioners to participate in the survey is unlikely to have had a major impact on the results. The incomplete response from subjects who were sent questionnaires was potentially a more important source of bias. However, the prevalence of low back pain was similar in those who replied to the first two mailings and in those who only answered the later shortened questionnaire. Furthermore, in the three centres where general practice records were reviewed, there was little difference between responders and non-responders in consultation rates for low back pain. Together, these observations suggest that there was no serious response bias.

Our prevalence estimates for low back pain cannot be compared directly with those of other investigators because we used different questions to ascertain symptoms. However, our findings are in broad agreement with reported lifetime prevalences of 62% among Danes aged 30–60 years,[9] 75% among Finns aged 30 years and over,[10] and 54% in Dutch men and women aged 20 years and over.[11] Substantially lower rates in other studies can be explained by differences in case definition.[12–14] The high frequency of sickness absence for low back pain also accords with other observations.[11 15]

The association that we found in men between low back pain and low social class is probably explained by differences in physical activity at work. The absence of a similar relation in women argues against an effect of nutrition or some aspect of the home environment. Moreover, analysis of occupational histories from our subjects indicates a clear association between the incidence of low back pain and heavy lifting at work.[16] Other studies have also shown higher rates of low back pain in manual occupations.[7 12 13 17 18]

Table III Lifetime and one year period prevalence (%) of low back pain and resultant disability by sex and social class. Prevalence rates have been adjusted by direct standardisation to the age distribution of the total sample. Social class could not be classified for 82 men and 163 women

		Men				*Women*			
		I & II (n=239)	*IIIN (n=137)*	*IIIM (n=423)*	*IV & V (n=291)*	*I & II (n=356)*	*IIIN (n=193)*	*IIIM (n=485)*	*IV & V (n=298)*
All low back pain	Lifetime	51·0	57·7	67·5	64·6	56·8	57·0	57·3	54·9
	One year	23·3	34·1	44·8	42·2	31·8	34·5	36·0	36·9
Low back pain making it impossible to put on socks, stockings, or tights	Lifetime	11·7	10·3	13·0	13·6	10·2	10·7	12·4	8·5
	One year	2·9	3·8	2·6	6·5	1·6	3·0	4·2	3·0
Low back pain associated with disability score ⩾9	Lifetime	13·2	15·9	16·2	16·9	13·4	14·7	14·4	12·2
	One year	2·9	5·4	4·9	8·1	1·9	4·6	5·6	6·2
Low back pain leading to consultation with general practitioner	Lifetime	30·8	35·6	46·0	47·4	38·9	38·0	43·0	38·9
	One year	7·6	7·5	15·8	22·0	10·8	15·8	15·2	18·2
Low back pain leading to time off work	Lifetime	22·3	27·3	39·8	38·5	20·9	22·1	27·4	22·5
	One year	5·6	7·5	12·6	13·9	4·8	10·9	7·9	6·9

Table IV Lifetime and one year period prevalence (%) of low back pain and resultant disability by area of residence. Prevalence rates have been adjusted by direct standardisation to the age and sex distribution of the total sample

		St Austell (n=246)	*Dorking (n=260)*	*Radnor (n=295)*	*Wisbech (n=354)*	*Ilkeston (n=466)*	*Darwen (n=331)*	*Peterlee (n=360)*	*Arbroath (n=355)*
All low back pain	Lifetime	54·4	56·5	56·3	61·9	59·8	57·6	61·5	56·2
	One year	33·8	32·4	34·5	39·7	38·1	31·9	39·4	36·3
Low back pain making it impossible to put on socks, stockings, or tights	Lifetime	12·7	11·4	12·8	13·2	12·3	10·1	12·1	6·3
	One year	2·1	3·0	2·5	4·6	4·1	3·1	5·9	1·6
Low back pain associated with disability score ⩾9	Lifetime	13·6	13·0	15·3	16·1	16·1	12·9	16·5	10·7
	One year	3·8	2·3	4·3	5·7	7·1	4·3	7·7	3·0
Low back pain leading to consultation with general practitioner	Lifetime	35·8	37·0	40·0	38·8	42·0	37·8	50·6	38·2
	One year	8·3	8·4	12·5	12·7	15·8	12·8	23·5	18·3
Low back pain leading to time off work	Lifetime	24·5	25·4	28·6	29·2	31·9	27·2	29·2	26·2
	One year	7·5	6·5	7·5	8·9	9·6	7·2	9·5	10·0

Table V Factors associated with consultation of general practitioner in subjects with low back pain during past year. Risks were estimated by multiple logistic regression with all factors fitted simultaneously

	No with low back pain	*No who consulted general practitioners*	*Relative risk*	*95% Confidence interval*
Sex				
men	442	167	1	
women	521	220	1·3	1·0–1·8
Age (years)				
20–29	206	81	1	
30–39	265	95	0·8	0·5–1·1
40–49	270	108	0·9	0·6–1·3
50–59	222	103	1·2	0·8–1·7
Social class				
I and II	172	57	1	
IIIN	111	39	1·0	0·6–1·7
IIIM	367	140	1·1	0·7–1·7
IV and V	231	117	1·7	1·1–2·6
unclassifiable	82	34	1·2	0·6–2·1
Disability score				
0–2	260	64	1	
3–6	321	122	1·8	1·3–2·7
7–8	251	113	2·6	1·8–3·9
9–16	131	88	6·4	3·9–10·4
Area of residence				
St Austell	82	20	1	
Dorking	84	21	1·2	0·6–2·6
Radnor	102	36	1·9	1·0–3·7
Wisbech	140	44	1·5	0·8–2·9
Ilkeston	177	74	2·2	1·2–4·1
Darwen	108	44	2·1	1·1–4·1
Peterlee	139	82	4·2	2·2–7·9
Arbroath	131	66	3·6	1·9–6·9

Geographical differences in the prevalence of low back pain were remarkably small. Few other studies have examined the geographical distribution of back disorders. Twofold differences in the prevalence of low back pain have been reported between different areas of Sweden[19] and the USA,[20] but neither of these analyses allowed for occupation or social class. A recent Finnish study which took account of occupation showed no important regional differences in low back pain or sciatica (M Heliövaara, personal communication).

In contrast to the homogeneous prevalence of symptoms, we found striking geographical differences in general practice consultation rates for low back pain. In the northern towns of Peterlee and Arbroath, patients with the symptom during the past 12 months were more than three times as likely to have consulted their doctor as those living in St Austell and Dorking (table V). This difference could not be explained by a confounding effect of age, sex, social class, or severity of symptoms. To check the accuracy of reported consultations, we reviewed practice notes in Dorking, Wisbech and Peterlee. Many consultations were not documented, perhaps because the low back pain was only a secondary complaint. However, the proportion of confirmed consultations was similar in the three towns, suggesting that the differences between places could not be attributed to biased recall. Other explanations might be differences in the perceived benefits of medical consultation or in the accessibility of alternative sources of advice such as chiropractors and acupuncturists. Little is known about geographical differences in propensity to consult a doctor once a symptom is present, but if the variability which we have demonstrated for low back pain applies also to other complaints, it could have important implications for the workload and organisation of general practice services.

We conclude that the geographical variation in rates of general practice consultation for low back pain in Britain is due largely to differences in patient behaviour once symptoms have developed, and that the distribution of important causes of low back pain across the country is probably uniform. Future studies should explore further what leads patients to consult their doctors when they have low back pain.

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