PRACTICE OBSERVED

Practice Research

Can general practitioners predict the outcome of episodes of back pain?

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In most patients who present with back pain in general practice a careful history and clinical examination do not enable the doctor to make a firm diagnosis. Indeed, the doctor may be uncertain of the value of the examination since treatment is in any case usually empirical. The report of the Department of Health's working group on back pain[1] concluded that "it is difficult to establish whether any approach materially influences the natural history of the underlying condition." Several studies from general practice have attempted to identify clinical features of patients when they present that would predict the outcome of episodes of back pain.[2–6] Except for the Danish study,[6] however, these have not tried to identify the most useful clinical features for the doctor to elicit. The aim of our study was to identify the fewest clinical features that were of prognostic value, and, as important, to identify aspects of the history and examination that were of little predictive value.

Sample and methods

A prospective study of 230 episodes of low back pain in patients who presented to one inner London group practice was carried out between June 1980 and June 1981. Patients were included in the study if they were aged between 16 and 64 years, had a primary complaint of low back pain, and had not consulted with back pain in the preceding 28 days. "Low back pain" was defined as pain in the area bounded by the lowest palpable ribs, the gluteal folds, and the posterior axillary lines. Pregnant patients and those with flu-like illnesses were excluded. In 217 episodes (94%) the patient was prescribed only simple analgesics in the four weeks after the initial consultation.

During the study year 215 patients presented with 230 episodes of back pain, 13 patients presented with two episodes, and one patient presented with three episodes. Analyses were performed on first episodes alone and on all episodes together. Since the results of these analyses were closely similar our results refer to all 230 episodes.

At the initial consultation details were recorded about the duration of pain, mode of onset, cause of onset, previous consultation with back pain, episodes of back pain in previous pregnancies, occupation, and social class. During the examination the doctor recorded height, weight, abnormalities of gait or posture on sitting, the site of maximal pain, radiation of the pain, and abnormalities on inspection of the spine. He also recorded pain or limitation of flexion, extension, and sidebending of the spine, limitation of straight leg raising to less than 30° or less than 60°, back pain on foot dorsiflexion at the limit of straight leg raising, pain caused by stressing the anterior or posterior sacroiliac ligaments, pain on hip rotation, knee and ankle reflexes, and muscular power and sensation in the legs. Detailed analysis of observer variation, which included the use of videotaped consultations,[8] showed that variation in the detection of sensory abnormalities was unacceptably high: these were therefore not included in the analysis.

The outcome measures in the study included a disability questionnaire,[7] a pain rating scale, absence from work, duration of time from the first to the last consultation of the episode, and recurrence of back pain. The disability questionnaire and pain rating scale were completed by the patient after the initial consultation, one week later, and one month later. For this study, "high disability score" was defined as a score of 14 or more out of a maximum of 24 on the disability questionnaire; this identified 38% of the sample at presentation and 15% of the sample one month later. The total number of days absent from work was recorded for the patients who worked—93% of the men and 84% of the women. In addition, the recurrence rate of back pain was measured in the 201 (87%) patients who remained registered with the practice for one year after the initial consultation. A recurrence was defined as any subsequent consultation with back pain that took place more than 28 days after the previous consultation with back pain. Twenty nine out of the 201 patients who remained registered with the practice for one year after the initial episode presented to the doctor with a recurrence.

Complete data on consultations, sickness absence, and a disability questionnaire and pain rating scale completed one month after presentation were available in 181 episodes (79%). Patients who failed to complete the study did not differ significantly from the main group in respect of any features that were subsequently found to be significantly related to prognosis. Multiple regression analyses were used to identify individual prognostic risk factors, allowing for the confounding effect of other variables associated with prognosis. For these analyses, the GLIM (generalised linear interactive modelling) statistical computing package[9] was used.

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Results

DEMOGRAPHIC CHARACTERISTICS

Of the 230 episodes of back pain in the study, 122 occurred in women and 108 in men. The overall consultation rate was 42·9 episodes/1000 patients at risk per year, with a slightly higher consultation rate for men than for women. The mean age of the sample of patients was 40·6 years. Whichever of the various outcome measures was used the outcome of the episode of back pain was not related to age, height, weight, obesity (measured by the Quetelet index), social class, or to whether the patient's occupation was manual or non-manual (using the Office of Population Censuses and Surveys classification[9]). Men, however, were more than twice as likely to be absent from work for more than two weeks compared to women ($\chi^2 = 7{\cdot}26$, $p < 0{\cdot}01$), an effect that was independent of the pain and disability reported by the patients at presentation and independent of whether the patient had a manual or a non-manual occupation.

HISTORY

The duration of pain before consultation most consistently predicted outcome. The most sensitive cut off point was pain that had lasted for one week or more before the consultation. Patients in this group (38%, of the sample) were more than twice as likely as the rest of the patients in the sample to have consulted the doctor two weeks after the initial consultation (table I) and more than twice as likely to have high disability scores at four weeks (table II). Aspects of the history that were not significantly related to any measure of outcome of the initial episode included what the patient was doing when the back pain started; back pain of sudden onset associated with bending or lifting; a history of visits to the doctor with back pain; back pain in previous pregnancies; or past history of prolapsed intervertebral disc. Patients who described their back pain as of gradual onset were significantly more likely to have high disability scores at four weeks compared to those who described their pain as being of sudden onset, but this effect was not seen with the other measures of outcome.

TABLE I—*Predictive value of duration of pain: outcome—duration of time from first to last consultation*

Duration of pain (weeks)	Time from first to last consultation (number of episodes)		Total No of episodes
	≤15 days	>15 days	
<1	100 (86%)	18 (14%)	127 (100%)
≥1	62 (73%)	23 (27%)	85 (100%)
Total No of episodes	171 (81%)	41 (19%)	212 (100%)

$\chi^2 = 5{\cdot}19$, $p < 0{\cdot}025$

TABLE II—*Predictive value of duration of pain: outcome—disability scores at four weeks*

Duration of pain (weeks)	Disability scores at four weeks (number of episodes)		Total No of episodes
	Low score (<14)	High score (≥14)	
<1	109 (89%)	13 (11%)	122 (100%)
≥1	54 (76%)	17 (24%)	71 (100%)
Total No of episodes	163 (84%)	30 (16%)	193 (100%)

$\chi^2 = 6{\cdot}02$, $p < 0{\cdot}025$

EXAMINATION

Over half of the 20 physical signs examined for their prognostic value were significantly related to at least one of the outcome measures. Many of the signs were highly correlated with one another—for example, limitation of straight leg raising and limitation of forward flexion. The GLIM program[9] was therefore used to identify independent prognostic risk factors and to identify, using a stepwise model fitting approach, the fewest physical signs that would give the same prognostic information as the complete examination, allowing also for any prognostic information included in the history.

TABLE III—*Predictive value of straight leg raising: outcome—disability scores four weeks after presentation*

Straight leg raising at presentation	Disability scores at four weeks (number of episodes)		Total No of episodes
	Low score (<14)	High score (≥14)	
<60° in either leg	57 (74%)	20 (26%)	77 (100%)
>60° in both legs	105 (91%)	10 (9%)	115 (100%)
Total No of episodes	162 (84%)	30 (16%)	192 (100%)

$\chi^2 = 10{\cdot}4$, $p < 0{\cdot}005$

The physical sign that most consistently predicted poor outcome was limitation of straight leg raising. Patients with limitation of straight leg raising to less than 60° in either leg were three times as likely to have high disability scores at four weeks compared to those with normal straight leg raising at presentation (table III). Patients whose straight leg raising was limited to less than 30° had virtually the same prognosis as those in whom it was limited to less than 60°. Those with a positive test result for crossed straight leg raising (pain in one leg with limitation of straight leg raising in the other leg) had a prognosis that was only marginally worse than patients in the rest of the sample. Taking prolonged absence from work as the measure of outcome, abnormal neurological signs were also predictive of poor outcome. This was independent of the pain and disability reported by the patient and may have been related to the behaviour of the doctor who, having detected an abnormal neurological sign, might have been more likely to certify the patient as unfit for work.

The primary site of the pain was not significantly related to any measure of poor outcome. The finding of other workers[2 10] that pain in the buttock carried a relatively poor prognosis was not confirmed. Pain radiating into the thigh was not associated with a significantly poor prognosis, though patients with pain radiating to the anterior thigh fared slightly worse than those whose pain radiated to the posterior thigh. Patients whose pain radiated below the knee had a worse prognosis than the rest of the patients in the sample in terms of disability scores and absence from work: this effect was not statistically significant, possibly because of the very low prevalence (6%) of radiation of pain below the knee.

Of the spinal movements that were examined, abnormalities of forward flexion were most strongly related to outcome. Examination of spinal extension and sidebending gave little prognostic information in addition to that gained by examining forward flexion: those patients in whom all four movements were limited had a slightly worse prognosis compared to those in whom flexion was limited but at least one of the other movements had a full range. Patients in whom extension was painful but flexion was normal (who may have had pain originating in the apophyseal joints) had a better prognosis than the rest of the patients with normal flexion: none of the 26 patients in this group had a high disability score at four weeks.

Neither pain produced by applying strain to the anterior or posterior sacroiliac ligaments nor pain reported in the sacroiliac region were of significant prognostic value.

Back pain on dorsiflexion of the foot at the extreme of straight leg raising was significantly related to high disability scores at four weeks ($\chi^2 = 7{\cdot}34$, $p < 0{\cdot}01$) and to absence from work for more than two weeks ($\chi^2 = 4{\cdot}08$, $p < 0{\cdot}05$). This physical sign may be a more useful indicator of nerve root tension than abnormal neurological signs, since the latter were found to be subject to greater interobserver variation and were inconsistently related to prognosis, as described.

HOW ACCURATELY CAN PROGNOSIS BE PREDICTED?

The results show that the two features most consistently related to prognosis were the duration of pain before consultation and limitation of straight leg raising. The prognosis of patients with combinations of these two features are shown in table IV in relation to disability scores and in table V in relation to duration of consultation: 97% of patients with a short history and normal straight leg raising had a good prognosis as measured by disability scores and 94%, as measured by duration of time between first and last consultations. It was not possible to predict accurately which patients would have a poor prognosis.

As a further possible prognostic indicator the doctors were asked at the initial consultation to estimate how long they thought the patient would be off work. A comparison between the predicted absence and the actual time taken off work is shown in table VI. The patient was unable to work for over two weeks in 28 (15%) of 183 episodes in which the doctor thought that the patient would be off for less than two weeks. But only 13 out of 41 patients (31%) who were off work for more than two weeks were correctly identified by the doctors at the start of the episode.

TABLE IV—*Predictive value of clinical features: outcome—disability scores at four weeks*

Combinations of clinical features	Disability scores at four weeks (number of episodes)		Total No of episodes
	Low score (<14)	High score (≥14)	
(A) Duration of pain <1 week (B) Straight leg raising <60°			
Neither A nor B	65 (97%)	2 (3%)	67 (100%)
One of A or B	83 (81%)	19 (19%)	102 (100%)
Both A and B	14 (61%)	9 (39%)	23 (100%)

TABLE V—*Predictive value of clinical features: outcome—duration of time from first to last consultation*

Combination of clinical features	Time from first to last consultation (number of episodes)		Total No of episodes
	≤15 days	>15 days	
(A) Duration of pain <1 week (B) Straight leg raising <60°			
Neither A nor B	63 (94%)	4 (6%)	67 (100%)
One of A or B	90 (79%)	24 (21%)	114 (100%)
Both A and B	18 (58%)	13 (42%)	31 (100%)

TABLE VI—*Accuracy of doctor's prediction of patient's absence from work*

	Actual sickness absence (number of episodes)		Total No of episodes
	≤2 weeks	>2 weeks	
Absence predicted by doctor			
≤2 weeks	155 (85%)	28 (15%)	183 (100%)
>2 weeks	6 (32%)	13 (68%)	19 (100%)
Total	161 (80%)	41 (20%)	202 (100%)

PREDICTION OF RECURRENCE

Of more than 40 demographic characteristics and aspects of the history and examination that were analysed, only two were significantly related to the probability of a recurrence in the calendar year after entry into the study. Patients who had visited the doctor with back pain on two or more occasions in the five years before the initial episode were more than twice as likely to present with a recurrence in the following year than patients with no such history ($\chi^2 = 5{\cdot}6$, $p < 0{\cdot}02$). Patients with unilateral abnormalities of reflexes on presentation were more than twice as likely to present with a recurrence of the back pain ($\chi^2 = 5{\cdot}22$, $p < 0{\cdot}025$). When interpreting these results it should be remembered that in analysing so many features two features may be expected to be significantly related to outcome at the 5% level by chance alone.

Discussion

Over 40 symptoms and signs of patients presenting to general practitioners with low back pain have been analysed to see whether they were related to the outcome of the episodes, which was measured in several different ways. About half of these symptoms and signs were significantly related to at least one of the outcome measures, Many of these features were highly correlated with one another. The duration of pain before the initial consultation and the limitation of straight leg raising were of the greatest prognostic significance and independent of all other symptoms and signs. Little additional information about prognosis was gained by including the 10 next most significant features in the analysis. Back pain on dorsiflexion of the foot at the extreme of straight leg raising was the best indicator of nerve root involvement. Neurological signs were of limited prognostic value, as also observed in hospital.[10]

In view of these results it is notable that Hull[11] found that British general practitioners thought that duration of pain was an important prognostic factor in only 29% of patients with back pain and straight leg raising in only 14%. These general practitioners judged past history to be the most important prognostic feature: in our study this was of little value in relation to the short term outcome of the episode, though a history of visits to the doctor with back pain was related to the risk of recurrence over the following year.

It was easier to predict which patients would have a good outcome than those with a poor outcome. Factors other than the physical symptoms and signs may be more important in patients whose pain runs a protracted course.

Conclusions

In a prospective study of 230 episodes of back pain presenting to general practitioners features of the history and clinical examination that predicted the outcome of the episode were identified. The most consistent predictors of poor outcome were a history of back pain lasting for more than one week before the initial presentation and limitation of straight leg raising at the initial examination. A past history of back pain, while not related to the outcome of the initial episode, was related to the risk of recurrence over the following year.

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Medical Records

Personal medical record card

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It is impossible to give good patient care without good medical records. Systems of record keeping, however, usually exclude the patient, who is often left with vague ideas of what diagnoses have been made and what treatments have been ordered. This may become important when the patient comes into contact with the emergency services or when changing general practitioners. If a patient is admitted to hospital without a covering letter from a general practitioner there is difficulty in obtaining medical information, particularly if the hospital is unable to contact the GP. When a patient changes his or her GP there is often a hiatus in record keeping while old records are processed by the family practitioner committee.

We decided to introduce a personal medical record card to cover such situations and to make patients aware of their health status. At first only new patients entering the practice were given a personal record card. It was linked with a new patient questionnaire, which was designed to provide a comparison between the patients' own ideas of their past medical histories and the medical histories contained in their records. The personal medical record card was prepared from the questionnaire and the past records.

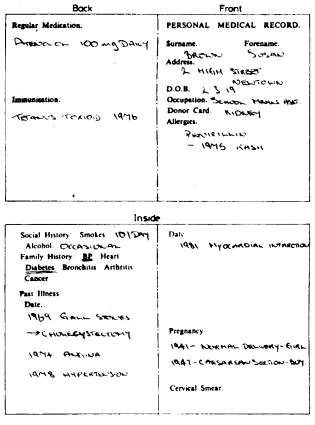
Four partners practise in a suburb on the outskirts of Birmingham. The practice population of 10 000 come from a small town of 6000 people, estates on the nearby urban development, and surrounding villages. Most of the patients are from social class III, but there is a sizable group of professional people.

Method and results

The card (figure) was produced in a format suitable to be carried by the patient at all times. Folded, it will fit into either a driving licence or cheque card holder. The card was given first to new patients joining the practice, who were asked to fill in a "new patient questionnaire" asking for details of past medical history, medicines, and allergies. Patients were asked if they wished to come for a health interview and if they were interested in having the personal medical record card.

After the patients' previous record cards had arrived from the family practitioner committee a health interview was arranged. The opportunity was taken to compare the patients' own ideas of their medical past from the questionnaire with the facts recorded by their previous doctors. The record cards were given to patients at the health interview, during which past or present health problems were discussed. The card has to be an agreeable record to both doctor and patient and sensitive or ethical problems were discussed before being recorded. We also carried out screening of blood pressure and urine testing in target groups.

The response of the patients to the health interviews and record card was encouraging. Of a total of 250 adult patients, 155 (62%) accepted and filled in the questionnaire. From a sample of 100 processed questionnaires, 59 patients came for a health interview, and 51 obtained a personal medical record card for their own use.



Personal medical record card.

Discussion

This new personal record card for patients has helped the doctor in the following ways. (*a*) *Correcting discrepancies in health knowledge*—Some patients had worrying gaps in their knowledge of their own past medical history. For example, they had no idea why laparotomies had been performed and were hazy about why they were taking regular medication. In 11% of a sample of patient questionnaires and interviews I thought that the patient's omission of information or the use of mistaken inform-

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