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Long-term prognosis of acute low back pain in patients seen in general practice: a 1-year prospective follow-up study

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Objective. We aimed to examine the prognosis of acute low back pain (LBP) in patients in general practice and to identify prognostic factors associated with the long-term prognosis based on information immediately available to the GP.

Method. We conducted a prospective cohort study in general practice in Denmark. The patients were those aged 18–60 years consulting their GP due to an episode of LBP lasting less than 2 weeks. The GPs collected data regarding 34 exposure variables, including their global assessment of the likelihood of chronic LBP. Outcome variables were collected from the patients after 1, 6 and 12 months. The outcome measures were days on sick leave, and functional or complete recovery from LBP.

Results. In total, 503 (96%) patients were followed during the whole study period. Fifty per cent of the patients on sick leave returned to work within 8 days; after 1 year, only 2% remained on sick leave. At the 1-year follow-up, 45% of the patients continued to complain of LBP. Logistic regression analyses showed that the factors most significantly associated with poor long-term LBP outcome were (i) severity of LBP at inclusion, (ii) assessments by the GP of susceptibility to develop chronic LBP and (iii) a history of LBP having caused previous sick leave.

Conclusions. LBP in general practice has a good prognosis with regard to sick leave, but a high proportion of patients continue to complain of LBP. We were not able to identify objective measures that strongly predict the prognosis of the individual LBP patient. The overall assessment by the GPs seems to be the most important predictor associated with the long-term outcome.

Keywords. Epidemiology, general practice, low back pain, prognosis.

Introduction

Low back pain (LBP) is a common disorder affecting a high proportion of rather young, otherwise healthy persons, causing an increasing number on permanent sick leave.[1–4] Several studies have analysed LBP patients in various hospital or industrial settings, but there have until recently been only few long-term, prospective studies based on patients in general practice.[5–11] Most of these studies have either included only a limited number of patients, have used relatively short follow-up periods or have used sick leave as the only main outcome variable. Recently, Korff *et al*.[10] have published data from a follow-up study which included all patients seen in primary care clinics. The patients are described by pain, disability, grade of depression and demographic characteristics. From this study with a 2-year follow-up, it is concluded that psychological variables are among the best predictors for back-related functional limitations.[12] All patients, with chronic as well as acute onset of LBP, are included in the study. As in other studies, there has been no attempt to incorporate GPs' often unique general knowledge about the patients and their backgrounds among the predictive variables.

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As the majority of LBP patients have a high spontaneous recovery rate in terms of return to work,[13,14] except for the study by Korff *et al.*,[11] most of the studies published so far have not had sufficient statistical power to identify prognostic factors for long-term LBP in patients in general practice. The course of LBP is extremely unpredictable—probably due to a large number of different and usually unknown underlying pathological processes.[7] It therefore seems unlikely that any particular treatment will show a major effect when applied indiscriminately to all LBP patients. This is in accordance with recent studies in which various treatment regimes had proved to have little influence on the time to recovery in patients with LBP.[13,15,16]

For this reason one of the major problems in treating patients with LBP in general practice is early identification of prognostic factors for the development of chronic LBP. Patients with a benign prognosis could then be reassured about the favourable spontaneous recovery rates, whereas more intensive diagnostic, treatment and rehabilitation efforts could be concentrated on the small group with the most severe prognosis.

Such a strategy, however, requires identification of prognostic factors to predict the long-term outcome in patients with acute LBP at the first GP consultation. Such studies in general practice should include easily handled predictive variables reflecting the GP's overall knowledge and assessment of the patients.

The aim of the present study was to follow a group of patients who consulted their GPs with acute low back pain in order (i) to examine the course of LBP in these patients and (ii) to identify predictors that are most strongly associated with a poor long-term prognosis based on information available to the GP at the first consultation.

Patients and methods

In Denmark more than 98% of the adult population receive free medical care from the individually chosen GP with whom they are registered. The other 2% prefer not to be on the list of a particular GP, but must then pay 50% of the fee to the GP. Further diagnostic procedures ordered by the GP, e.g. specialist appointment or laboratory test, are free of charge for the patients, but there is a differentiated reimbursement of patients' expenses for prescribed drugs and therapy given by physiotherapists and chiropractors. The GPs act as gatekeepers to the secondary health care system, including specialists working outside hospital.

All GPs (n = 330) in the County of North Jutland (487 000 inhabitants) were invited to include patients aged 18–60 years who consulted them for low back pain of less than 14 days duration. Patients with episodes of LBP in the previous 6 months (according to GP's interview with the patient), vertebral fractures, malignancies and other disabling illnesses were excluded, as were pregnant women and non-Danish speaking patients. One hundred and thirty GPs agreed to participate, and a total of 524 patients were enrolled by 75 GPs (median 6.5, range 1–41 per physician) from October 1992 to August 1993.

Study design

The design was a prospective cohort study. At the index consultation the GPs recorded basic information from the history and physical examination, including the variables listed below, and the patients received written information about the project. The GPs' records together with signed informed consent from the patients were mailed to the project group, which was then responsible for all later contacts with the patients. Three weeks after the index consultation, the patients were contacted by telephone by one of the members of the study group in order once more to introduce the study, specify low back pain and to prepare the patients for the mailed questionnaires 1, 6 and 12 months after the index consultation. If a completed questionnaire was not returned within 2 weeks, a postal reminder was sent to the patient, and if this produced no response, the patients were interviewed by telephone.

Follow-up assessments at 2, 3, 4 and 5 years are currently in progress.

It was mandatory that the management of the LBP patients in the study reflected the daily routine in general practice. Supplementary investigational procedures such as routine spine radiographs or other standard investigations were therefore not included in the study protocol.

Definition of prognostic and outcome variables

Prognostic variables. At the index consultation, the GPs filled in a questionnaire including a total of 34 items classified in one of the following five categories: (i) demographic data; (ii) medical history of LBP; (iii) history concerning the index episode of LBP; (iv) physical examination; and (v) overall assessment by the GPs. For the last category, we used a simple, self-constructed four-point scale (most likely/likely/hardly/not at all) addressing the following three questions to the GP: (a) Is it likely that this patient will develop chronic LBP?; (b) Is this patient vulnerable to mental stress?; and (c) Is it likely that the actual condition was caused by working conditions? The other specific questions reported in this paper are shown in the tables.

Outcome variables. One, six and twelve months after the index consultation the patients completed questionnaires about matrimonial status, occupation and the following outcome variables:

(i) on sick leave at time of questionnaire (yes/no);
(ii) number of days on sick leave since the index consultation or since last questionnaire;

(iii) functional recovery at time of answering the questionnaire (ability to manage ordinary daily activities, yes/no); and
(iv) complete recovery at time of answering the questionnaire (feeling of well-being with regard to low back problems, yes/no).

In order to describe outcome, we defined the following three categories:

(i) poor outcome—on sick leave between questionnaires or not functionally recovered at follow-up;
(ii) fair outcome—functionally but not completely recovered (able to manage ordinary daily activities but not well-being with regard to LBP) with no sick leave at any time between questionnaires; and
(iii) good outcome—no indication of LBP at any time between questionnaires.

Statistics

Analyses were performed using the SPSS statistical software.[17] Bivariate relations were evaluated using the chi-square test, and odds ratios were calculated with 95% confidence intervals (95% CI). The prognostic value of the selected variables for a poor outcome was assessed using logistic regression. The analyses were performed in the five chosen groups to adjust for covariates. The variables with a statistical significant OR were used in a model adjusted for sex and age. The goodness of fit was controlled by the Hosmer and Lemeshow test.[18]

When categorical variables were analysed, the Indicator-Variable Coding Scheme was used (marked in the tables). The Mann–Whitney U-test was used for analyses of number of days on sick leave.

Ethics

The study protocol was approved by the Ethics Committee of the Counties of Viborg and North Jutland, file No. 92/3 and the National Board of Registries, file No. 1992-1110-843. Written informed consent was obtained from all participants. From the County of North Jutland, the GPs received a double fee for each consultation leading to the inclusion of a patient.

Results

Patients

Of the 524 patients who entered the study, 13 (2%) did not reply to the 1-month questionnaire and six (1%) did not want to participate. At 6 and 12 months, an additional two patients failed to answer subsequent questionnaires, giving a total reply rate at 1-year follow-up of 96% (503/524). The 21 drop-outs did not differ from the rest of the cohort by age or sex. Baseline characteristics of the 503 patients are shown in Table 1; 62% were male, with a slightly lower median age at time of entry. More men than women had experienced previous LBP episodes, and pain in the back only was more common in males than in females. Ninety-seven per cent were employed or employable at entry.

Main outcome variables

Data concerning main outcome variables at 1, 6 and 12 months are shown in Table 2. Forty-three per cent of all patients were on sick leave when they left the consultation. After 1 month, 97% (95% CI 96–98%) had returned to work, and after 12 months only 2% (95% CI 1–4%) remained on sick leave. The overall duration of sick leave in the first month is shown in Figure 1. Fifty per cent of the 223 patients on sick leave at the index consultation had returned to work within 8 days. When the cohort was stratified according to the risk of developing chronic LBP as assessed by the GPs, there was a significant difference in the duration of sick leave in the first month ($P < 0.001$) (Fig. 2). Patients with a positive straight leg raising (SLR) test had significantly more ($P < 0.001$) days off work during the first month than the rest of the group (Fig. 3). However, after 1 month, patients with positive SLR did not differ significantly from the others with respect to any of the other outcome parameters.

Even though nearly all the patients had returned to work after 1 month, 16% (95% CI 13–20%) did not regard themselves as functionally recovered. This figure declined to 8% (95% CI 6–11%) at 12 months. At follow-ups at 6 and 12 months, respectively, 53 and 46% of the patients did not consider themselves as being completely recovered. Between visits, approximately 15% of the patients had been on sick leave (Table 2).

Two patients underwent surgery for a herniated lumbar disc during the first year of follow-up.

Identification of prognostic factors associated with LBP prognosis

Poor outcome was used as our main outcome in the following analysis, combining the information about sick leave between questionnaires and outcome at the day of follow-up. The number of patients reporting poor outcome is shown in Table 3.

The information available to the GP at index consultation was divided into five categories. Bivariate and logistic regression analyses were applied to all the categories. All variables regarded clinically important or with a statistically significant association with the outcome variable 'poor outcome' were included in the final model, in order to identify prognostic factors associated with the long-term prognosis of LBP patients (Tables 4–6).

Only a few of the selected variables seemed to have a significant association with poor outcome. The assessment by the GPs of susceptibility to develop chronic LBP was the factor most strongly associated with poor outcome. Despite the fact that our group of

TABLE 1 *Baseline characteristics of 503 patients completing the 1-year follow-up based on information from the GP; data representing men and women are shown; differences tested using the Chi-square test*

Prognostic variables	All	Men	Women
Demographic:			
Number	503	311	192*
Age, years (median, inter-quartile)	38 (29–46)	37 (28–44)	40 (31–48)*
Employed at entry of study (yes/no) (%)	91	94	86**
Married (yes/no) (%)	79	79	80
BMI (median, inter-quartile)	25 (22–27)	25 (23–25)	23 (21–23)**
Medical history of LBP:			
Previously experienced episodes of LBP (yes/no) (%)	70	72	66*
Previous episodes of sick leave because of LBP (yes/no) (%)	44	51	32***
Previous hospitalizations due to LBP (yes/no) (%)	5	5	5
Previous lumbar X-ray (yes/no) (%)	32	34	28
History concerning the index episode of LBP:			
Duration of acute pain (median, days)	4	3	4
Sick leave at index consultation (yes/no) (%)	43	48	34***
Aggravation by impulsion (yes/no) (%)	33	31	36
Sudden onset (hours) (%)	72	72	71
Localization:			
Pain in lower back only (%)	60	66	51**
Pain radiating to thigh (%)	28	25	33*
Pain radiating below the knee (%)	12	9	16***
Physical examination:			
Transfer of pain (yes/no) (%)	33	33	33
Restriction of lumbar movement (yes/no) (%)	79	79	80
Radiating pain on straight leg raising test <60° (yes/no) (%)	14	14	14
Missing reflexes in the leg (yes/no) (%)	4	3	4
Muscular paresis in the leg (yes/no) (%)	0.2	0	0.5
Overall assessment by the GPs			
Index LBP is probably caused by occupation[a] (%)	17	20	12**
Patient is psychologically very vulnerable or vulnerable[a] (%)	10	9	11
Patient will most likely or probably develop chronic LBP[a] (%)	16	16	16

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.
[a] Global assessment by GP on four-point scales (most likely/likely/hardly/not at all); yes = most likely or likely.

LBP patients had acute pain, factors such as former sick leave due to LBP and disability at time of consultation were also important. Stratifying the cohort according to presence or absence of former consultation due to LBP or sick leave, made no difference to associations among the patients with former LBP. Among patients without former consultations due to LBP, the trends indicated associations between long-term prognosis and age, sex and positive straight leg raising test (SLR). Assessment of chronicity remained unchanged. Sick leave at consultation, assessment of psychological vulnerability and LBP assessed as due to occupation were not associated with 1-year prognosis in patients without former LBP consultations (data not shown). These results support the observations from the logistic regression analyses that former consultation due to LBP was an important prognostic factor for long-term LBP.

Table 5 shows how the GP's assessments affect outcome at 6 or 12 months..

Recalculating the data including the number of patients enrolled per GP as a separate variable did not reveal any significant impact of this factor (data not shown). Nor did we find any influence of treatment given at the consultation on long-term prognosis.

TABLE 2 *Main outcome variables at 1, 6 and 12 months; percentages with 95% confidence intervals and absolute figures*

		Baseline	1 month	6 months	12 months
Sick leave at time of questionnaire:	%	43	3	3	2
	CI	39–47	1.7–4.9	1.7–4.9	1.0–3.7
	No.	213	15	15	10
Sick leave between follow-ups:	%		44.5	15.2	14.8
	CI				
	No.		224	76	73
Not functionally recovered:	%	57	16	9	8
	CI	53–61	13–20	6.5–11.5	5.8–10.7
	No.	283	78	47	41
Not completely recovered:	%	100	59	56	46
	CI		54–63	52–60	41–49
	No.	503	297	281	229

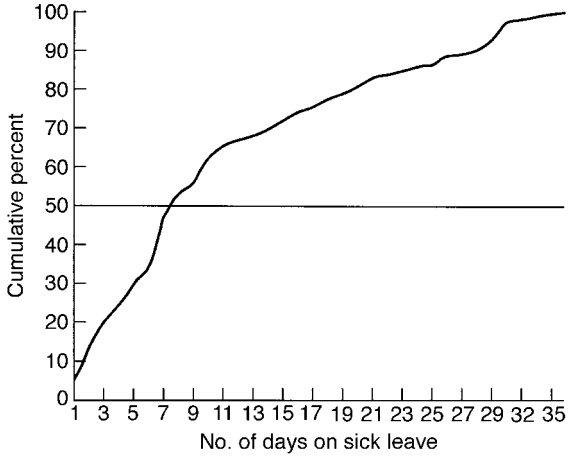

FIGURE 1 *Number of days on sick leave during the first month after onset of LBP; more than half of the patients are back to work after 1 week, and 75% within the first 2 weeks*

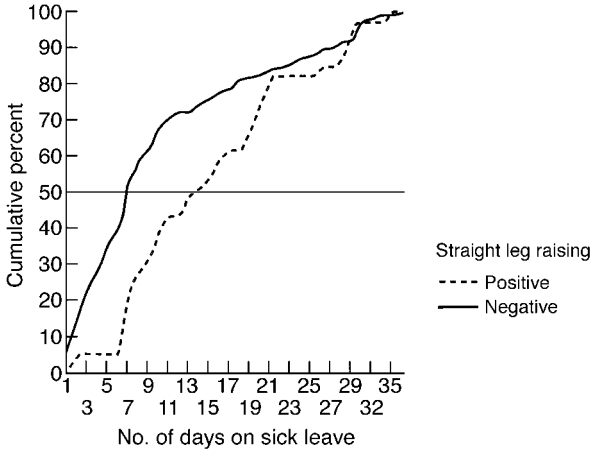

FIGURE 2 *Number of days on sick leave during the first month after onset of LBP stratified by outcome of straight leg raising test; patients having a positive test had more days on sick leave than others during the first month, but at the end of the first month no obvious difference was found*

Discussion

The present study from general practice indicates that in relation to sick leave, LBP has a relatively favourable prognosis, with a 50% return to work within the first 8 days and only 2% on sick leave after 1 year. Only 0.4% had a lumbar disc operation within the first year. However, 15% of the patients had been on sick leave during the following year and about 50% continued to complain of discomfort, indicating that an acute episode of LBP causing a consultation with the GP is followed by a longer period with low-grade disability than previously expected. The traditionally applied objective assessment does not give a valid identification of LBP patients in general practice with prolonged low back problems. The overall assessment by the GPs seemed to be the most important prognostic factor associated with the long-term outcome. None of the three assessments was unambiguous, and different factors may explain the individual assessment. This difference may be one of the topics for further analysis.

The subject of this study was to describe the natural course of acute LBP patients and to identify prognostic factors associated with long-term prognosis. Our intention was to describe the patients with as little study-related bias as possible. The description of the prognosis should include the full range of predictor variables and manifestations that would be considered important to the patients. GPs interested in back pain would be selected for a study like this, which might mean that the

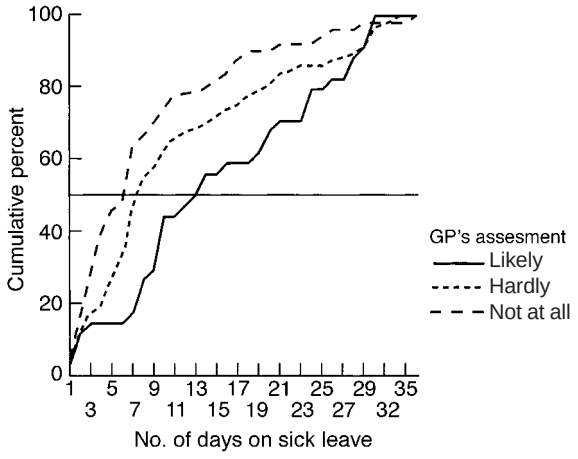

FIGURE 3 *Number of days on sick leave during the first month after onset of LBP, related to the GP's assessment according to outcome*

TABLE 3 *Outcome categories at 1, 6 and 12 months; percentage with 95% confidence intervals and absolute figures*

		1 month	6 months	12 months
Poor outcome:	%	53	19	17
	CI	48.6–57.4	15.6–22.4	13.7–20.3
	No.	267	97	87
Fair outcome:	%	24	40	30
	CI	20.3–27.7	35.7–44.3	26.0–34.0
	No.	118	194	148
Good outcome:	%	24	40	52
	CI	20.3–27.7	35.7–44.3	47.6–56.4
	No.	118	193	256

patients are treated more vigorously, but it has not been shown in previous studies that treatment in the acute phase will change long-term prognosis, and we do find our group of LBP patients representative of the general LBP population.

In order to reduce the number of non-included patients, the GP was paid for the time spent to fill in the inclusion forms. Additionally, the GPs who had agreed to include patients were sent a monthly follow-up letter to remind them about the study. We have not done a systematic follow-up analysing how many patients we have missed. There could have been selection bias due to an association between risk of inclusion and outcome if the GPs who included a high or low number of patients systematically obtained a different outcome. However, neither separate calculations of outcome, in relation to the number of patients included per GP, nor inclusion of this factor as a separate variable in the logistic regression analyses revealed any impact of this factor on the outcome. The number of drop-outs was remarkably low for an out-patient study (4%); the bias due to this factor will therefore be of minor importance.

The outcome variables were collected directly from the patients completely independently of the exposure variables collected by the GPs. In reporting the number of days on sick leave during the first month, there could be a tendency to under-reporting by patients with a fast recovery. However, this potential bias—which might overestimate the reported association—affects only the number of reported days off work during the first month. In order to keep the questionnaire as simple as possible to minimize drop-outs, the three main outcome variables consisted of simple yes/no questions with regard to the condition at the time of actually answering the questionnaires. We found consistency in the graduation of the answers to the three outcome variables (sick leave/functional recovery/complete recovery) and we therefore consider that the answers were valid. Combining the outcome variables as poor/fair/good outcome we tend to minimize the number of outcome variables and the patients are categorized in more homogeneous groups.

As in other studies, we found a high number of patients without any absenteeism from work, and additionally a high rate of return to work within a few days. However, despite having returned to work, 8–16% indicated that they were not functionally recovered. This is probably a major reason for the minor impact of sick leave on the long-term prognosis. This indicates that although absenteeism from work is a relatively well-defined and often-used variable, it is too insensitive for use as a comprehensive single outcome parameter in studies of LBP. Approximately 15% of the patients were on sick leave between follow-ups, indicating a recurrent pain pattern —another factor which has to be dealt with in follow-up studies describing LBP.

As pain and discomfort are subjective sensations, we found it important to include these patient-reported questions of recovery with regard to low back problems. It is striking that almost half the patients described themselves as not completely recovered even after 1 year. These figures should be interpreted in relation to general health surveys which indicate that about 20% of people in the background population will report low back pain at any time.[2,4] This observation is in accordance with Chavannes and Carey, who found that 72% reported continuous pain after 4 weeks and 31% after 6 months.[9]

Age and sex had minor influence on the prognosis, as did the GP's assessment that the pain was related to occupation. A history of LBP was a fairly consistent prognostic factor for prolonged low back problems. In accordance with other studies, gradual onset and pain radiating below the knee indicated a slightly more prolonged course. Naturally, sick leave at consultation was highly correlated with sick leave at 1 month, but

TABLE 4 *Prognostic factors of poor outcome at 6 and 12 months, based on bivariate analyses; odds ratios with 95% confidence intervals; all 503 patients completing questionnaires were included in the calculations*

Variable			6 months		12 months	
	Prognostic factor	All %	OR	95% CI	OR	95% CI
Demographic:						
Age	>40 years	52	0.84	0.5–1.3	0.99	0.6–1.6
Sex	men	62	0.85	0.5–1.3	0.96	0.6–1.5
Married	yes	80	0.65	0.4–1.1	0.80	0.5–1.4
Employed	yes	91	0.57	0.2–1.1	0.99	0.5–2.0
BMI	>25	42	0.6	0.7–1.0	0.6	0.4–1.0
Medical history:						
Consultations due to LBP	never	30	1.33	0.6–1.7	1.27	0.7–2.1
	a few	30	1.03	0.8–2.3	1.21	0.7–2.2
	many	40	1.00		1.00	
Previous:						
Sick leave due to LBP	yes	44	2.00	1.3–3.1	2.74	1.7–4.4
Hospitalizations due to LBP	yes	5	1.3	0.5–3.5	1.94	0.8–4.8
Lumbar X-ray	yes	32	1.36	0.9–2.2	2.53	1.6–4.1
Manual therapy	yes	32	0.94	0.6–1.5	1.29	0.8–2.1
Chiropractic therapy	yes	21	1.2	0.7–2.1	2.12	1.3–3.5
Physical therapy	yes	30	1.6	1.0–2.5	1.99	1.2–3.2
History concerning the index episode:						
Duration of acute pain	>4 days	17	1.20	0.8–1.9	1.03	0.6–1.6
Sick leave	yes	43	1.70	1.1–2.6	1.4	0.9–2.3
Disabled		56	2.62	1.6–4.3	2.84	1.7–4.8
Aggravation by impulsion	yes	33	1.23	0.8–1.9	1.35	0.8–2.2
Sudden onset	gradual	27	1.13	0.7–1.8	1.21	0.7–2.0
Localization	lower back	60	1.70	0.9–3.3	1.5	0.4–2.9
	radiating to thigh	28	1.50	0.7–3.0	1.22	0.58–2.58
	below the knee	12	1.0		1.0	
Physical examination:						
Restriction of lumbar movement	yes	79	1.37	0.8–2.5	1.40	0.8–2.6
Transfer of pain	yes	33	1.20	0.8–1.9	1.41	0.9–2.3
Straight leg raising test	positive	14	1.57	0.9–2.8	1.53	0.8–2.8
Neurological deficit	yes	5	1.72	0.7–4.2	0.93	0.3–2.8
Muscle pain	yes	82	0.89	0.5–1.6	1.08	0.6–2.0
Percussion test	positive	19	1.04	0.6–1.9	1.54	0.9–2.7
Assessments by the GPs:						
LBP assessed as caused by occupation	yes	17	0.90	0.5–1.9	1.79	0.9–3.3
	likely	23	0.40	0.2–0.8	0.86	0.4–1.7
	not at all	60	1.00		1.00	
Susceptible to develop chronic LBP	most likely	3	2.00	0.4–10.4	11.60	2.9–46.9
	likely	14	1.10	0.2–5.5	5.00	1.3–17.9
	hardly	58	0.40	0.1–2.1	2.27	0.6–8.7
	not at all	25	1.00		1.00	
Vulnerable to mental stress	vulnerable	10	2.70	1.0–7.4	4.00	1.3–12.1
	normal	54	2.70	1.3–5.8	2.12	1.0–4.4
	sturdy	27	2.10	1.1–4.1	3.00	1.5–6.0
	very sturdy	9	1.00		1.00	

TABLE 5 *Prognostic factors of poor outcome based on logistic regression analysis controlling for covariance; odds ratios with 95% confidence intervals*

Variable		6 months		12 months	
	Prognostic factor	OR	95% CI	OR	95% CI
(1) Demographic:					
Age	⩾40 years	0.84	0.5–1.13	1.01	0.6–1.6
Sex	men	0.80	0.5–1.3	0.88	0.5–1.5
Married	yes	0.68	0.4–1.1	0.78	0.4–1.4
Employed	yes	0.52	0.2–1.1	0.91	0.4–2.1
BMI	>25	0.59	0.4–0.9	0.59	0.4–1.0
(2) Medical history:					
Consultations due to LBP	many	1.30	0.8–2.4	1.30	0.7–2.4
	a few	1.10	0.6–1.9	1.40	0.8–2.5
	never	1.0		1.0	
Previous:					
Sick leave due to LBP	yes	2.10	1.2–3.6	2.10	1.2–3.8
Hospitalizations due to LBP	yes	0.70	0.2–2.1	0.80	0.3–2.1
Lumbar X-ray	yes	0.90	0.5–1.8	1.70	0.9–3.1
Manual therapy	yes	0.70	0.4–1.2	0.90	0.5–1.4
Chiropractic therapy	yes	0.90	0.5–1.8	1.40	0.8–2.6
Physical therapy	yes	1.20	0.7–2.1	1.00	0.6–1.8
(3) History concerning the index period:					
Duration of acute pain	>4 days	1.37	0.8–2.3	1.16	0.7–2.0
Disabled	yes	2.94	1.8–4.9	3.10	1.8–5.4
Aggravation by impulsion	yes	1.00	0.7–1.8	1.21	0.7–2.0
Sudden onset	gradual	1.20	0.7–2.0	1.39	0.8–2.5
Localization	lower back	1.00		1.00	
	radiating to thigh	1.30	0.6–2.8	1.13	0.5–2.5
	below the knee	1.60	0.8–3.1	1.34	0.6–2.8
(4) Physical examination:					
Restriction of lumbar movement	yes	1.30	0.7–2.4	1.20	0.6–2.4
Transfer of pain	yes	1.10	0.6–1.7	1.20	0.7–2.1
Straight leg raising test	positive	1.30	0.7–2.5	1.30	0.7–2.4
Neurological deficit	yes	1.80	0.7–4.5	0.90	0.3–2.8
Muscle pain	yes	0.90	0.5–1.6	1.10	0.6–2.1
Percussion test	positive	1.10	0.6–1.9	1.50	0.9–2.6
(5) Assessments by the GP					
LBP assessed as caused by occupation	yes	0.80	0.4–1.6	1.41	0.7–2.7
	likely	0.38	0.2–0.8	0.81	0.4–1.6
	not at all	1.00			1.00
Susceptible to develop chronic LBP	most likely	1.41	0.3–7.9	9.43	1.2–40.9
	likely	1.01	0.2–5.1	4.71	1.2–17.8
	hardly	0.41	0.1–2.0	2.27	0.6–9.2
	not at all	1.00			1.00
Vulnerable to mental stress	vulnerable	2.21	0.8–6.4	2.62	0.8–8.3
	normal	2.50	1.1–5.6	1.55	0.7–3.4
	sturdy	2.05	1.0–4.2	2.50	1.2–5.1
	very sturdy	1.00		1.00	

TABLE 6 *Prognostic factors of poor outcome at 6 and 12 months based on logistic regression analysis, including selected variables being significantly important in the analysis shown in Table 5; demographic and statistical significant variables were included in the model*

Variable		6 months		12 months	
	Prognostic factor	OR	95% CI	OR	95% CI
Age	>40 years	0.73	0.5–1.2	0.80	0.5–1.3
Sex	men	0.69	0.4–1.3	0.70	0.4–1.2
Previous sick leave due to LBP	yes	1.55	0.9–2.6	2.30	1.3–3.9
Disabled	yes	2.26	1.3–3.8	2.40	1.3–4.2
LBP assessed as caused by occupation	yes	0.79	0.4–1.6	1.40	0.7–2.7
	likely	0.41	0.2–0.9	0.90	0.4–1.8
	not at all	1.00		1.00	
Susceptibility to develop chronic LBP	most likely	1.61	0.3–9.5	10.40	2.2–49.1
	likely	1.20	0.2–6.3	6.10	1.5–24.9
	hardly	0.54	0.1–3.0	3.70	0.9–16.9
	not at all	1.00		1.00	
Vulnerablity to mental stress	vulnerable	1.90	0.6–5.7	2.40	0.7–7.9
	normal	2.20	1.0–1.5	1.30	0.6–3.0
	sturdy	1.79	0.9–3.7	2.20	1.0–4.7
	very sturdy	1.00		1.00	
Hosmer and Lemeshow	(p)	0.96		0.10	

otherwise this factor was not associated with the long-term prognosis.

One reason for this relatively low predictive value of the history of the index episode and the traditionally used physical examination may be that this set of diagnostic procedures has been developed mainly in hospital settings to identify patients for surgery for lumbar disc herniation.[19] However, in general practice the vast majority of these patients have unspecified LBP, e.g. only two patients had an operation for lumbar disc herniation in our study. It is therefore not surprising that the predictive powers of the various tests differ between the two populations.[20]

The two parameters that most consistently and significantly contributed to the prognosis were global assessments by the GPs of the likelihood of chronicity and psychological vulnerability. It is remarkable that even when looking only at patients without former LBP consultations, the assessment of chronicity continued to represent the most consistent association with long-term outcome. The ability of the GPs to identify high-risk patients therefore seems to be independent of knowledge of specific LBP problems. The global assessments of the GPs seem better able to take into account the complex and probably far less well-defined indicators of adverse long-term outcome.

Our data thus indicate that the traditionally applied variables are inadequate for sufficient identification of LBP patients in general practice with a prolonged course. However, on a simple four-point scale, the GPs seemed to obtain a more comprehensive integration of the various past and present observations and intuitions that are associated with the long-term prognosis of LBP patients in general practice.

This observation is new and needs to be confirmed in other studies in general practice. These studies should include validation of simple and easily handled rating scales which addresses the complex factors that may be used by the GPs to assess the LBP prognosis, e.g. education, prognosis of unemployment, job satisfaction and social, psychological and economic factors. Rating scales completed by the patient for this purpose are shown in different settings, but most of them are too complicated to be used in the clinic as a screening-tool. We have not seen rating scales filled in by the GPs used in the acute situation.

In conclusion our observations indicate that LBP patients in general practice have a relatively good prognosis with respect to sick leave, but about 15% of the subjects in this study had been on sick leave because of recurrent complaints and 50% continued to complain of low back discomfort after 1 year. We were not able to

identify objective factors at the first visit to the GP that strongly predict the prognosis of these LBP patients. Overall assessment by GPs seems to be the best of the applied means of predicting the long-term prognosis of LBP patients.

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