Chronic low back pain in primary care: a prospective study on the management and course
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Background. There is little evidence about the management and course of chronic low back pain in primary care.

Objectives. Our aim was to describe the course of chronic low back pain and the performed diagnostic and therapeutic procedures for patients with chronic low back pain in general practice.

Methods. Twenty-six GPs involved in the Registration Network Family Practices participated in this prospective follow-up study. All patients and GPs were asked to complete questionnaires at baseline and at 4, 8 and 12 months follow-up.

Results. The GPs provided information about diagnostic and therapeutic procedures concerning 524 patients with chronic low back pain. Diagnostic tests other than history-taking and physical examination were not frequently used. Medication, mostly NSAIDs, was the most frequently used type of treatment (21.6%). The most frequent referrals concerned physiotherapy (16.3%) and neurology or neurologic surgery (6.3%). Information about the course of their chronic low back pain was provided by 368 patients participating in our study. The course of chronic low back pain appeared to be quite stable, as there was only a slight improvement in pain intensity and physical functioning over the 12 months of follow-up.

Conclusions. A variety of options for the treatment and referral of chronic low back pain patients is available for and used by GPs. Efforts should be made to establish which diagnostic and therapeutic procedures are the most effective for chronic low back pain.

Keywords. Chronic low back pain, diagnosis, general practice, management, therapy.

Introduction

Low back pain (LBP) is one of the most frequent reasons for which patients consult a GP in The Netherlands, and the second major reason for consulting office-based physicians in the United States. In the UK, the annual number of GP consultations for back pain was estimated to be approximately 14–15 million. LBP is often regarded as a benign and self-limiting disease with a recovery rate of 90% within 6 weeks, but LBP may become chronic and recurrences occur very frequently. Approximately 1–7% of the incident cases will develop into persisting LBP after 3 months, and are usually labelled as chronic cases. Our understanding of the course of LBP in general practice still seems to be rather poor, especially in chronic cases.

In The Netherlands, a patient seeking medical care will usually first visit a GP, because the GP is the only type of physician involved in primary care and is, therefore, the ‘gate-keeper’ of the medical system. The majority of health problems presented to GPs are treated by the GPs themselves and, in principle, they are responsible for all referrals to paramedical therapists or medical specialists. Many different therapeutic interventions are available for the treatment of LBP, but the efficacy of most of these interventions has not yet been demonstrated. An accurate choice of the best

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diagnostic and therapeutic procedures is often hampered by the limited scientific knowledge in this field.5-8

Recently, a number of both evidence-based and consensus-based guidelines for the management of LBP in primary care have become available, two of which include the management of chronic LBP.3,6 In The Netherlands, evidence-based guidelines for the management of acute and chronic LBP in general practice have recently been published.9 In a national survey among a random sample of physicians from eight specialist fields in the United States, including family doctors and GPs, the reported use of diagnostic tests and therapeutic interventions for chronic LBP did not correspond with the guidelines that have been issued by the Quebec Task Force on Spinal Disorders.10,11 Several studies have investigated the management of LBP in primary care, but the populations in these studies included acute, or a mix of acute and chronic, LBP patients.12-14 Little is known about the diagnostic and therapeutic interventions which GPs apply to patients with chronic LBP.

We have undertaken two studies on the management and course of chronic non-specific LBP in general practice in The Netherlands: a retrospective and a prospective study. Results of the retrospective study have been described elsewhere.15 In this prospective study we addressed the following research questions: (i) what diagnostic and therapeutic modalities are applied to patients with chronic LBP in general practice?; (ii) to which paramedical therapists and medical specialists are patients with chronic LBP referred by the GP?; and (iii) what is the course of chronic LBP in general practice?

Methods

Registration Network of Family Practices

The 26 GPs who participated in this study were related to the Registration Network Family Practices of the University of Limburg in The Netherlands. All GPs participating in the Registration Network used computerized systems to store and continuously update the medical records of all their patients. All health problems were classified according to the International Classification of Primary Care (ICPC),16 and were only recorded by the GPs if they were permanent (no recovery expected), chronic (duration longer than 6 months) or recurrent (more than 3 recurrences within 6 months). The participating GPs were representative of all GPs in the Registration Network, except that they volunteered for the study. They were also representative for all other Dutch GPs, except that more of the GPs in this study worked in group practices or health centres, more practices were located in urban areas, a higher percentage were members of the Dutch College of General Practitioners and a higher percentage had computerized medical records. The patient population in this Registration Network was representative for the Dutch general population with regard to age, gender, type of insurance and education. The data of the Registration Network have previously been described in detail and have been demonstrated to be reliable.17,18

Patient sample

Patients were included in the study if they had either LBP (ICPC-code L03) or LBP with radiating symptoms (ICPC-code L86), they were aged 20-60 years and they had had their current symptoms for at least 3 months. Patients were excluded if they had specific LBP caused by infection, metastasis, osteoporosis, rheumatoid arthritis or fractures. The GPs selected prevalent cases with chronic LBP from their computerized databases using the relevant ICPC-codes (L03 and L86). In order to guarantee the privacy of the non-responders with regard to the researchers, the first questionnaire with a letter of introduction and information was sent to the patients by the GPs as soon as possible after selection (and not by the researchers). Patients were invited to participate and asked to return the completed questionnaire to the research institute. The non-responders remained anonymous to the researchers. As some patients might have been registered as permanent, chronic or recurrent LBP patients, but had not had current LBP for more than 3 months, we checked the questionnaires to ensure that the patients met our inclusion criteria.

Measurements and instruments

All patients and GPs were asked to complete questionnaires at baseline and after 4, 8 and 12 months. The baseline questionnaire was used in the retrospective study and has been described elsewhere.15

The three prospective GP questionnaires were identical and contained items about the frequency of diagnostic modalities, therapeutic interventions and referrals to paramedical therapists or medical specialists for LBP during the previous 4 months. All data were collected by the GPs from their computerized database in which all information concerning each patient, i.e. the medical record, is stored.

Information on relevant patient characteristics was gathered by means of the baseline patient questionnaire. The three prospective patient questionnaires contained items about the course of the LBP complaints. The average pain intensity during the week before completion was measured on a 10-point ordinal scale, ranging from 1 (no pain) to 10 (very severe pain). A global measurement of improvement during the previous 4 months was assessed on a 5-point ordinal scale, ranging from 1 (much better) to 5 (much worse). The number of episodes of LBP during the previous 4 months and the duration of each episode (in weeks) were multiplied to assess the total duration of the LBP during the previous 4 months. Absenteeism from work during the previous 4 months was measured in weeks (if
patients reported absenteeism for less than 1 week, 0.5 weeks was scored). The Roland Disability Questionnaire (RDQ) was used to assess the functional status of the patients. The RDQ consists of 24 items concerning general activities of daily life. Each item ticked scores one point; therefore a patient’s score can range from 0 to 24. High scores on the RDQ indicate a low functional status. The Nottingham Health Profile (NHP) was used to assess the general health perception of the patients. The NHP contains 38 questions reflecting six scales (sleep, physical mobility, energy, pain, emotional reactions and social isolation). Appropriate weights are given to positive answers in each scale, according to their relative severity, resulting in a range from 0 to 100 for any scale. Higher scores correspond to a lower health perception.

The three prospective patient questionnaires also contained items about visits to paramedical and complementary therapists (including the number of visits and the number of weeks of treatment) and visits to medical specialists (number of visits) during the previous 4 months. In order to minimize the loss to follow-up, a reminder was sent to the participants if we had not received the prospective follow-up questionnaires after 10 days. If we still had not received the questionnaires a week after the reminder had been mailed, we tried to contact the participants by telephone. A second questionnaire was sent if requested by the participants or if we were not able to contact the participants by telephone within 2 days.

Statistical methods
All variables used to describe the course of the complaints (pain intensity, global improvement, duration, number of episodes, NHP and RDQ) were presented by the mean and standard deviation (SD) if they were normally distributed, and by the median and interquartile range (IQR) if they were not normally distributed. Descriptive statistics were used to present the frequencies of the diagnostic and therapeutic interventions and the referrals for the 12-month follow-up. All frequencies are based on the total number of participants or patients, minus the loss to follow-up, minus the missing values. The 95% CIs around these frequency estimates were assessed by using the Confidence Interval Analysis version 1.0 (Copyright 1989; MJ Gardner and British Medical Journal, London).

Based on the pain intensity and the RDQ-score during the 12-month follow-up, subgroups were composed, i.e. those with scores lower and higher than the median value. For the selection of the subgroups, the pain intensity and the RDQ-scores were assessed by adding up the scores of the three follow-up questionnaires and dividing this total score by three. The differences between these groups on the duration of the LBP complaints before baseline and the scores on the NHP-scales of pain and physical mobility at baseline were assessed by a Mann–Whitney U test. The differences between the groups with regard to the pain intensity and the RDQ-score at baseline were assessed by a t-test. The same tests were used to assess the difference in these baseline variables between participants who did and did not visit the GP during the 12-month prospective follow-up. A P-value of 0.05 was used as a criterion for statistical significance. All analyses were made on SPSS 4.0.1.

Results

Patient sample
A total of 650 patients with chronic LBP were invited to participate in this study, of whom 403 (62%) completed and returned the baseline questionnaire. Of these 403 participants, 55 did not meet our inclusion criteria and were not included in the study; 12 because they were over 60 years of age and 23 because they had not been suffering from their current episode of chronic LBP for longer than 3 months. Therefore, complete information from the patients themselves and from their GPs was available for 368 participants. The GPs were asked to provide (anonymously) information of the 247 non-participants. However, due to lack of time, not all the GPs completed questionnaires regarding non-participants. The GPs completed questionnaires for only 156 non-participants. Therefore, the total study population consisted of 524 patients with chronic LBP, 368 participants (data from patients and GPs) and 156 non-participants (data from GPs only).

Loss to follow-up
Forty of the 368 participants (10.9%) failed to complete at least one follow-up questionnaire: one participant had died of lung cancer, 10 did not want to continue participating, but gave no particular reason, and 29 did not respond even after they had been sent a reminder and/or a second questionnaire. However, the GPs completed questionnaires for 35 of these 40 participants who were lost to follow-up.

Twenty-six of the 524 patients (5%) were lost to follow-up because their GPs failed to provide complete follow-up data for these patients: 19 had moved, or had registered with another GP, one had died of lung cancer (as stated before) and six had notified their GP that they no longer wanted to participate. Nine patients of the 19 who had moved or had registered with another GP continued to participate.

Patient characteristics
The mean age of the participants at baseline (n = 368) was 41.1 years (SD 10.0), 51% were men, 85% were married or cohabited and 75% had public health insurance. Participants and non-participants did not differ significantly with regard to age, insurance, civil
### Table 1: The course of chronic low back pain in general practice (n = 368)

<table>
<thead>
<tr>
<th></th>
<th>Baseline mean (SD)</th>
<th>4 months mean (SD)</th>
<th>8 months mean (SD)</th>
<th>12 months mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain intensity(^a)</td>
<td>5.6 (2.9)</td>
<td>5.1 (2.9)</td>
<td>5.1 (2.7)</td>
<td>4.8 (2.9)</td>
</tr>
<tr>
<td>Global improvement(^b)</td>
<td>2.9 (1.3)</td>
<td>2.7 (1.0)</td>
<td>2.8 (1.1)</td>
<td>2.7 (1.1)</td>
</tr>
<tr>
<td>RDQ(^c)</td>
<td>9.5 (5.8)</td>
<td>8.8 (6.0)</td>
<td>8.7 (5.9)</td>
<td>8.1 (6.0)</td>
</tr>
<tr>
<td>NHP-pain(^d)</td>
<td>40.5 (10.5–69.8)</td>
<td>34.7 (9.0–64.4)</td>
<td>32.4 (9.0–67.4)</td>
<td>31.4 (0–67.4)</td>
</tr>
<tr>
<td>NHP-physical mobility(^d)</td>
<td>21.8 (11.2–34.4)</td>
<td>21.8 (11.2–34.4)</td>
<td>21.8 (11.2–34.4)</td>
<td>21.8 (11.2–34.4)</td>
</tr>
</tbody>
</table>

SD: standard deviation; IQR: interquartile range.
\(^a\) Pain intensity was measured on a 10-point ordinal scale ranging from 1 (no pain) to 10 (very severe pain).
\(^b\) Global improvement during the previous 4 months was measured on a 5-point ordinal scale ranging from 1 (much better) to 5 (much worse).
\(^c\) The Roland Disability Questionnaire (RDQ) was used to measure functional status (range 0–24).
\(^d\) NHP: Nottingham Health Profile; each scale ranges from 0 to 100.

status or diagnosis, but the proportion of females among participants (49%) was significantly higher than among non-participants (29%).\(^{15}\) About 29% of the participants who had a job reported having been absent from work due to LBP during the 12-month prospective follow-up. Among this subgroup the median number of weeks of absenteeism due to LBP was 6.5, ranging from 0.5 to 48 weeks. Twenty participants had started receiving a (partial or full) disability pension, implying that they had been absent from work for more than 52 weeks due to LBP.

### Course of the LBP complaints

Six per cent of the participants did not report any complaints during the total follow-up of 12 months, while 57% reported complaints in all three 4-month follow-up periods (about 10% of the participants reported having LBP continuously throughout the 12 months follow-up). The remaining 37% reported complaints in one (14.5%) or two (22.5%) of the follow-up periods. Table 1 shows the mean pain intensity, the mean global improvement in the LBP, the mean RDQ-scores and the median scores on the NHP-scales for pain and physical mobility, at baseline and after 4, 8 and 12 months of follow-up. The median scores of the NHP-scales for energy, sleep, emotional reactions and social isolation were zero for all three prospective follow-up measurements (data not shown).

Table 2 shows that patients who had visited a GP for LBP, who on average had more pain (pain intensity ≥ 5) and were more functionally impaired (RDQ ≥ 8) during the 12-month prospective follow-up, had significantly higher baseline scores for pain intensity, RDQ and NHP-scales for pain and physical mobility. Patients with a higher pain intensity and a higher RDQ-score during the 12-month prospective follow-up had also had a longer duration of LBP at baseline.

### Diagnosis, therapy and referrals

Forty-two per cent of the patients (n = 524) had visited their GP during the 12-month follow-up because of LBP, with a median number of visits of two (range 1–11). Patient-history was reported by the GP for 31.6% (95% CI 27.5–35.8) of the patients (n = 524), 28.9% (95% CI 24.9–32.9) underwent a physical examination, X-rays were taken of 6.0% (95% CI 4.1–8.5), laboratory tests were carried out for 1.7% (95% CI 0.7–3.2) and computed tomography and magnetic resonance imaging were both used for 1.2% (95% CI 0.5–2.7) of the patients (n = 524).

Table 3 shows that the GPs had reported providing treatments for 27.2% of the total population (n = 524) during the 12-month prospective follow-up. As 58% had not visited their GP, this represented 64% of those making at least one visit. Medication, mostly NSAIDs (16.3%), was the treatment most frequently given. Of those receiving any treatment, 79% received a medication.

Table 4 reveals some major discrepancies between self-reported visits of patients to paramedical therapists and medical specialists and the referrals reported by the GPs. About 39% of the participants (n = 368) reported that they had not visited a paramedical therapist or medical specialist, whereas the GPs reported that they had not referred about 69% of the participants (n = 368). Many more participants reported visits to paramedical therapists than had been referred by the GPs. Only about 3% of the participants had been
### Table 2: Comparison of baseline scores between subgroups of chronic low back pain patients (n = 368)

<table>
<thead>
<tr>
<th>Subgroups</th>
<th>Duration (median)</th>
<th>Pain intensity (mean)</th>
<th>RDQ (mean)</th>
<th>NHP-pain (median)</th>
<th>NHP-physical mobility (median)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit to GP:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>no</td>
<td>57.5</td>
<td>5.3</td>
<td>8.6</td>
<td>20.5</td>
<td>21.8</td>
</tr>
<tr>
<td>yes</td>
<td>51.5</td>
<td>6.0</td>
<td>10.6</td>
<td>61.5</td>
<td>21.8</td>
</tr>
<tr>
<td>Pain intensity:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 5</td>
<td>40</td>
<td>4.2</td>
<td>7.4</td>
<td>20.5</td>
<td>11.2</td>
</tr>
<tr>
<td>&gt; 5</td>
<td>73.5</td>
<td>7.0</td>
<td>11.6</td>
<td>61.5</td>
<td>26.5</td>
</tr>
<tr>
<td>RDQ:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 8</td>
<td>36</td>
<td>4.2</td>
<td>5.7</td>
<td>19.5</td>
<td>11.2</td>
</tr>
<tr>
<td>&gt; 8</td>
<td>71</td>
<td>6.7</td>
<td>12.9</td>
<td>60.5</td>
<td>31.1</td>
</tr>
</tbody>
</table>

RDQ: Roland Disability Questionnaire; NHP: Nottingham Health Profile.

* The difference between the two subgroups regarding the baseline scores of the duration and the NHP scales for pain and physical mobility was assessed by Mann–Whitney-U/Wilcoxon rank sum test.

* The difference of the pain intensity and the RDQ was assessed by t-test.

* See Analysis section for definition of subgroups.

* P < 0.05.

* P < 0.01.

### Table 3: Therapeutic modalities of chronic low back pain in general practice during the 12-month prospective follow-up, as reported by the GPs (n = 524)

<table>
<thead>
<tr>
<th>Modality</th>
<th>%</th>
<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No therapy</td>
<td>72.8</td>
<td>(68.8–76.8)</td>
</tr>
<tr>
<td>Heat application</td>
<td>4.0</td>
<td>(2.4–6.2)</td>
</tr>
<tr>
<td>Rest</td>
<td>5.7</td>
<td>(3.8–8.2)</td>
</tr>
<tr>
<td>Medication:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paracetamol/Aspirin</td>
<td>21.6</td>
<td>(17.9–25.3)</td>
</tr>
<tr>
<td>NSAID</td>
<td>16.3</td>
<td>(12.8–19.8)</td>
</tr>
<tr>
<td>Benzodiazepine</td>
<td>3.3</td>
<td>(1.8–5.5)</td>
</tr>
<tr>
<td>Other tranquilizers</td>
<td>0.7</td>
<td>(0.1–2.0)</td>
</tr>
<tr>
<td>Injection</td>
<td>0.4</td>
<td>(0.05–1.5)</td>
</tr>
<tr>
<td>Postural advice</td>
<td>6.1</td>
<td>(4.1–8.7)</td>
</tr>
<tr>
<td>Work advice</td>
<td>1.3</td>
<td>(0.5–2.7)</td>
</tr>
<tr>
<td>Other treatment</td>
<td>3.0</td>
<td>(1.6–4.9)</td>
</tr>
</tbody>
</table>

* Percentage of patients who were treated at least once with a specific therapeutic modality during the 12-month prospective follow-up; note that several modalities could be applied to one participant, so these percentages cannot be added up to form a total score.

* CI: confidence interval.

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During the 12-month follow-up: nine participants had visited a rehabilitation specialist, nine participants a homeopath, nine participants a magnetic therapist, six participants a psychologist, four participants an acupuncturist, three participants a paranormal healer, two participants a back school and two participants a haptotherapist. Treatment had been given to one participant by each of the following, respectively: an anthroposophic therapist, an ergotherapist, a naturopath, a 'heilpraktiker', a psychiatrist, a 'meridian therapist' and a holistic therapist.

### Discussion

The aim of this study was to provide a description of the management and course of chronic LBP in general practice. Our study population consisted of prevalent cases of chronic LBP with a median duration of LBP of 53.5 months at baseline (range 4–492 months). At baseline, 59% had experienced only one episode of LBP in their lives, while the remaining 41% reported a median of three previous episodes. During the 12-month prospective follow-up, the median total duration of LBP was 16 weeks and the median number of episodes three. On average, patients appeared to improve only slightly during the prospective follow-up with regard to pain intensity, functional status and general health perception regarding pain and physical mobility. Patients who had more pain, a lower functional status and a longer duration of LBP at baseline had a higher pain intensity or a lower functional status during the 12 months prospective follow-up. As we included only prevalent cases of chronic LBP in our study,
we cannot conclude that these factors are prognostic indicators for chronic LBP. They may indicate, however, that the course of chronic LBP is quite stable, and that once LBP has persisted for longer than 3 months recovery is unlikely, especially in the more severe cases. Von Korff et al. also found that pain intensity, disability and number of days in pain were prognostic indicators of a poor outcome in consecutive back pain cases, i.e. both recent onset and chronic cases. Prevention of chronicity should be one of the major aims in the management of LBP in primary care. Only those future prospective studies with incident cases will be able to provide valid data on the prognostic indicators of chronic LBP.

Compared with the results of the retrospective study (79%), far fewer patients (42%) had visited a GP because of LBP during the prospective 12-month follow-up, despite the fact that 94% still reported having had LBP for some time during this period. Consequently, fewer diagnostic and therapeutic interventions were reported and fewer patients were referred during the 12-month prospective follow-up. In accordance with the results of our retrospective study, we again found some discrepancies between the self-reported visits of patients to paramedical therapists and the referrals reported by the GPs. The self-reported visits to paramedical therapists were again more frequent than the referrals reported by the GPs. In the retrospective study, we argued that the discrepancy regarding the referrals from the GPs and patients’ utilization was likely to be caused by over-reporting by the patients, due to recall bias, and under-reporting by the GP, due to incomplete registration. Recall bias was expected to be a lesser problem in our prospective study, because in all three questionnaires the patients were asked to report on the previous 4 months, which seems to be a short enough period to recall. Therefore, the discrepancy might have been the result of incomplete registration by the GPs or due to patients’ self-referrals. Because paramedical therapy in The Netherlands is only covered by insurance if a patient is referred by a GP or medical specialist, we argue that self-referrals to regular paramedical therapy are not very common in The Netherlands. Self-referrals are more likely to occur to complementary therapies, as GPs usually do not refer patients to complementary therapies. Readers should be aware of these discrepancies if a study of the management of LBP in primary care is based solely on data from patients or GPs.

Recently, the Dutch guidelines for the management of LBP in general practice have been published. According to these guidelines, the main goal of treatment of chronic LBP patients should be physical restoration through reactivation with emphasis on return to work and usual daily activities. Exercise therapy seems to be the most promising treatment option, though its effectiveness has not been demonstrated beyond doubt. Exercise therapy was not frequently applied by the GPs
according to our study, but the most frequent referrals involved physiotherapy. Exercise therapy is one of the treatment modalities most frequently used in chronic LBP by physiotherapists in The Netherlands, in addition to and often in combination with massage therapy, manual therapy and physical therapy modalities such as ultrasound, electrotherapy, or heat and cryotherapy. According to the Dutch guidelines, these physical therapy modalities are not effective for the treatment of chronic LBP patients. We did not investigate any treatments that the physiotherapists applied to the patients and, therefore, it remains unknown if these referrals involved exercise therapy and if they were aimed at re-activation of the patient. According to the Dutch guidelines, symptomatic pain relief is not a major treatment goal but may be used to facilitate the re-activation of the patient. Medication, mostly NSAIDs, was the intervention most frequently applied by the GPs in our study, but it is unknown if the frequent prescription of NSAIDs was used just to relieve pain or to facilitate re-activation. As we did not ask the GPs for their motives, we cannot conclude whether the management was appropriate or inappropriate. However, the wide variety in therapeutic interventions applied and referrals made seems to indicate that the management is not very consistent. To date, no therapy has been demonstrated by randomized controlled trials to be clearly effective in the management of chronic LBP and, consequently, GPs have no other alternative than to offer chronic LBP patients various therapeutic interventions of uncertain effectiveness. There is a clear need for future randomized controlled trials which try to avoid the common methodological shortcomings we have described elsewhere. Future studies are also needed to evaluate the implementation of (the Dutch) guidelines for LBP in general practice.

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