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Routine primary care management of acute low back pain: adherence to clinical guidelines

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Abstract One of the major challenges for general practitioners is to manage individuals with acute low back pain appropriately to reduce the risk of chronicity. A prospective study was designed to assess the actual management of acute low back pain in one primary care setting and to determine whether existing practice patterns conform to published guidelines. Twenty-four family physicians from public primary care centers of the Basque Health Service in Bizkaia, Basque Country (Spain), participated in the study. A total of 105 patients aged 18–65 years presenting with acute low back pain over a 6-month period were included. Immediately after consultation, a research assistant performed a structured clinical interview. The patients' care provided by the general practitioner was compared with the

Agency for Health Care Policy and Research (AHCPR) guidelines and guidelines issued by the Royal College of General Practitioners. The diagnostic process showed a low rate of appropriate use of history (27%), physical examination (32%), lumbar radiographs (31%), and referral to specialized care (33%). Although the therapeutic process showed a relatively high rate of appropriateness in earlier mobilization (77%) and educational advice (65%), only 23% of patients were taught about the benign course of back pain. The study revealed that management of acute low back pain in the primary care setting is far from being in conformance with published clinical guidelines.

Keywords Low back pain · Primary health care · Physicians, family · Practice guidelines

Introduction

Acute low back pain continues to be a major health problem in the Western industrialized world. Epidemiologic studies report the prevalence of acute low back pain to range from 7.6% to 37% among different populations [6]. In Spain, low back pain is perceived by the general population to be the number one health-related problem [3] and, as in many other countries, it is one of the commonest conditions prompting a visit to the general practitioner (accounting for between 2 and 4% of consultations in the primary care setting) [1, 4, 21, 25, 28].

Apart from controlling the patient's current pain, the main aim of primary management of acute and subacute

episodes of back pain is to prevent a chronic course. The general practitioner has been defined by some experts as the key worker in the management of the problem [12, 19]. Low back pain is usually a benign and self-limiting disease, which tends to improve spontaneously over time (90% of patients with acute low back pain improve within 6 weeks regardless of any treatment provided) [2, 29, 36]. However, for many primary care patients the course of back pain is recurrent [34]. One of the major challenges in the field of low back pain is to develop strategies that emphasize earlier active management through primary care in order to reduce the risk of individuals with acute attacks becoming established as chronic sufferers [4, 13, 23, 29]. It is the chronic or repetitive problems that may be associated with disability and are responsible for the high

cost in terms of health care expenditure and production losses [16, 20, 32, 37].

On the other hand, despite the numerous reviews and guidelines now available, it is unclear how most general practitioners assess and manage patients with acute low back pain and how their everyday management relates to these guidelines. Accordingly, this study was designed with the following purposes:

1. To determine the actual characteristics of the diagnostic process and adequate management of acute low back pain in the primary care setting of the Basque Country (Spain)
2. To assess the appropriateness of existing practice patterns according to guidelines from the medical literature, and
3. To identify patient characteristics associated with appropriate utilization of medical resources.

Materials and methods

Study population

All general practitioners ($n=33$) working in four general practices in public primary care centers of the Basque Health Service in Bizkaia, Basque Country (Spain) were invited to participate in the study. Physicians were unaware of the purpose of the study and were only told that the objective was to contribute to the knowledge of low back pain. They were requested to attend patients and to register salient information in the patient's medical record as they usually do in routine daily consultation. Twenty-four physicians (73%) agreed to participate in the study. Each physician participated for a period of 3 months during the 6-month enrolment interval. A specific training program for the care of patients with low back pain was not available at any of the participating centers. The Basque Health Service is a body of the Basque government, financed with public funds, which provides universal free health care services to every citizen of the Basque Country (population of approximately 2,100,000). Subjects are individually included in the list of a primary care physician, who acts as gatekeeper for access to specialized medical care.

All patients aged 18–65 years of age who spontaneously sought medical care at the primary care center and made an appointment with their general practitioner because of acute low back pain between October 1998 and March 1999 were eligible. The following criteria were used to assess eligibility:

1. First consultation with the general practitioner because of a current episode of pain localized in the lower back with or without leg pain.
2. Duration of pain less than 8 weeks prior to the index visit.
3. No back pain reported in the 3 months prior to the index episode.
4. Domiciliary visits and pregnant women were excluded.

Measures

Physicians taking part in the study were requested to refer patients on the same day and immediately after their consultation to an interview with a research assistant who administered a standardized questionnaire. Questionnaires were administered at the same primary care center. Inclusion criteria were confirmed by the research assistant before administration of the questionnaire. Data regarding medical history, job situation, lifestyle activities, psychosocial status [15], characteristics of pain [30], and disability [27] were

recorded. Interviews were conducted in the general practices by two research assistants – physicians trained in administering the standardized questionnaire. During this consultation, patients underwent a physical examination. This procedure was considered necessary to make a diagnostic assessment and to establish the appropriate procedure according to clinical practice guidelines.

Patients were also interviewed for details of their visit to the general practitioner in relation to indication of diagnostic tests, referrals for specialized care, recommended treatment, and whether education advice had been given, in order to establish whether the care provided by the general practitioner was in accordance with clinical guidelines.

After 7 weeks (when pain has subsided in the majority of cases, and re-evaluation of the problem is necessary for symptoms not resolving or getting worse) [5, 17, 26], patients were interviewed by telephone by the same research assistant regarding disappearance of pain and any further primary care consultation, diagnostic testing, referrals to subspecialty care, and any recommendations prescribed by the general practitioner since the index visit at the primary care center. In addition to information obtained from the patient's interview, physicians taking part in the study provided authorization to the research assistants to review the patients' medical records. Therefore, it was possible to assess whether physicians had recorded the same anamnestic data and salient features of physical examination found by research assistants in the structured interview.

Specific elements of the diagnostic and therapeutic approach were judged appropriate or inappropriate based on comparison with the Agency for Health Care Policy and Research (AHCPR) guidelines (US) [5] and guidelines issued by the Royal College of General Practitioners (UK) [17] – these being the most well-known guidelines in our environment while awaiting the development of our own guidelines. The following elements were assessed: history and physical examination, laboratory tests, lumbar radiographs, referral to specialized care, bed rest, and educational advice. Recommendations of both panels include the decision to request plain lumbar radiography in patients aged over 50 years [5, 17]. In this study, however, lumbar radiography was not considered to be appropriate in this group of patients in the absence of “red flags”, due to the low positive predictive value of lumbar radiography in these cases [31].

A procedure was considered *appropriate* if the benefits outweighed the risks, *necessary* (or of crucial importance) if withholding the procedure would be deleterious to the patient's health, *overutilization* or *inappropriate* if the risks outweighed the benefits, and *underutilization* if a necessary procedure was not used [7, 18]. Overutilization rate (inappropriate/appropriate procedures) and avoidable costs (proportion of inappropriate procedures) were calculated. This evaluation was carried out independently by the authors. Cases in which the recommendation for the use of the procedure was doubtful (e.g., where there were doubts about the initial assessment of the patient's complaint as being nonspecific lumbar pain) were not taken into account in the evaluation.

Analysis

Multiple logistic regression analyses were performed to assess whether patients' characteristics (sex, age, job situation, pain intensity, functional status, duration of pain, and history of previous episodes of low back pain) were independently associated with appropriate use of history and physical examination, lumbar radiography, earlier mobilization, educational advice, and referral to specialized care according to US and UK clinical guidelines for acute low back pain [5, 17]. The likelihood of the dependent variables is expressed as the odds ratio (OR) with the 95% confidence intervals (CI). Statistical significance was set at $P<0.05$.

Results

Of a total of 105 patients with acute low back pain who fulfilled the inclusion criteria, 102 (97%) completed the study. The mean (standard deviation, SD) number of patients recruited per physician was 4.3 (3.5). Patients had a mean age of 45 (12.9) years, and 59% were women. On entering the study, duration of the back pain was less than 2 weeks in 82% of cases; in the majority of patients, pain intensity and functional disability were moderate, without leg pain. Seventy-three percent of patients had suffered from previous episodes of low back pain. Characteristics of the patients at the index visit are shown in Table 1.

After 7 weeks, 102 patients were contacted by telephone and resolution of pain was recorded in 70% of them. Thirty-five %patients (33%) had attended at least a second consultation with their general practitioner during this period of time because of persistence of pain. Of the 31 patients in whom pain had not subsided at 7 weeks, only 15 (48%) had been seen again by the general practitioner, but there were no significant differences in functional status between those who had made additional visits to the general practitioner and those who had not.

Table 1 Characteristics of patients ($n=105$). All values are percentages unless otherwise indicated (*GHQ* General Health Questionnaire [15], *VAS* visual analog scale [30], *RMDQ* Roland-Morris Disability Questionnaire [27])

Age, years: mean (SD)	45 (12.9)
Women	59.1
Risk at work ^a	
High	57.1
Medium	28.6
Low	14.3
Smokers or ex-smokers	64.8
Sedentarism ^b	70.5
GHQ score >6	41
Previous episodes	73.3
Duration of pain ≤2 weeks	81.9
Intensity of pain (10-cm VAS)	
Mild (1–3)	19.2
Moderate (4–7)	62.5
Severe (8–10)	18.3
Functional disability(RMDQ)	
Mild (0–7)	30.5
Moderate (8–15)	47.6
Severe (16–24)	21.9
Leg pain	6.7
Sick-leave ^c	39.7

^aTaking into account: weight, posture, rotation, vibration and movement

^bPhysical activity during the spare time for the past two weeks <750 min

^cAs a percentage of working people ($n=73$)

Table 2 Diagnostic and therapeutic procedures

	Index visit $n=105$ (% , 95% CI)	Subsequent visits $n=35$ (% , 95% CI)
Anamnestic data	28 (26.7, 18.5–36.2)	
Examination	34 (32.4, 23.6–42.2)	
Laboratory tests	6 (5.7, 2.1–12.0)	3 (8.6, 1.8–23.0)
Lumbar radiography	19 (18.1, 11.3–26.8)	15 (42.9, 26.3–60.6)
Referral to specialized care	11 (10.5, 5.3–18.0)	18 (51.4, 34.0–68.6)
Bed rest	26 (24.8, 16.9–34.0)	
Drug use		
NSAIDs	74 (70.5, 60.8–79.0)	
Analgesics	20 (19.0, 12.0–28.0)	
Muscle relaxants	37 (35.2, 26.2–45.0)	
Topical NSAIDs	6 (5.7, 2.1–12.0)	
Other drugs	4 (3.8, 1.0–9.5)	
Educational advice	66 (62.8, 53.0–72.0)	17 (48.6, 31.4–66.0)

Of the total number of patients included in the study, 15% had no medical history, and anamnestic data had been recorded in only 26.7% and results of physical examination in only 32.4% (Table 2). Lumbar radiographs were ordered at the index visit in 18% of patients, although this proportion as well as the use of diagnostic testing and referral services increased for subsequent visits. Nonsteroidal anti-inflammatory agents (NSAIDs) were prescribed in 70.5% of patients, and muscle relaxants in 35.2%. Bed rest for more than 2 days was recommended in 25% of patients, with earlier mobilization being favored in the majority of cases. Educational advice was delivered to 63% of patients, but only 23% were informed of the benign course of back pain. Of the 11 patients who were referred at their first consultation, all were referred to orthopedics (one patient to orthopedics and physical therapy). Of the 35 patients who attended a second consultation with their general practitioner, 18 were referred: 13 to the orthopedic surgeon, 2 to the rheumatologist, 1 to the osteopath, 1 to the neurologist, and 1 to an internal medicine specialist.

Conformance of specific elements of the diagnostic and therapeutic approach with clinical guidelines is shown in Table 3. Earlier mobilization and educational advice were the appropriate measures most frequently recorded, whereas the percentages of appropriate use of medical history, physical examination, laboratory tests, lumbar radiography, and referrals to specialized care were much lower, although an improvement in subsequent primary care visits was observed. In contrast, there were relatively few cases of overutilization of medical services. Underutilization of plain lumbar X-rays occurred in six out of seven cases (86%). Diagnostic testing and referrals to specialized care accounted for the main proportion of avoidable costs (Table 3).

Appropriateness of earlier mobilization was associated with male gender (OR=3.2, 95% CI 0.96 to 11) and mild

Table 3 Conformance with the clinical guidelines

	Clinical perspective			Costs	
	Appropriate use (%)	Inappropriate use or overutilization (%)	Underutilization (%)	Avoidable costs (%)	Overutilization ratio
Index visit (<i>n</i> =105)					
History	28/105 (26.7)		77/105 (73.3)		0/28
Examination	34/105 (32.4)		71/105 (67.6)		0/34
Laboratory tests	1/13 (7.7)	5/76 (6.6)		5/6 (83.3)	5/1
Lumbar X-rays	5/16 (31.2)	8/63 (12.7)	6/7 (85.7)	8/19 (42.1)	8/5
Referral	1/3 (33.3)	6/72 (8.3)		6/11 (54.5)	6/1
Mobilization ^a	61/79 (77.2)	2/4 (50)		2/78 (2.6)	2/61
Education	55/85 (64.7)	1/4 (25) ^b		1/66 (1.5)	1/55
Successive visits (<i>n</i> =35)					
Laboratory tests	2/8 (25)	1/27 (3.7)		1/3 (33.3)	1/2
Lumbar X-rays	10/16 (62.5)	5/19 (26.3)	2/3 (66.7)	5/15 (33.3)	5/10
Referral	12/17 (70.6)	6/18 (33.3)	1/1	6/18 (33.3)	6/12
Education	17/34 (50)				0/17

^aNo prescription of bed rest or bed rest <2 days

^bThe four cases were low back pain secondary to other pathologies

functional disability (OR=14.8, 95% CI 1.7 to 131), whereas the absence of previous episodes of low back pain was associated with appropriateness of medical history (OR=2.3, 95% CI 0.9 to 5.7) and physical examination (OR=2.8, 95% CI 1.2 to 7).

Discussion

Although family physicians from the Basque Country conform to clinical practice guidelines with respect to recommendations for earlier mobilization and provision of educational advice to patients with acute low back pain, there were substantial deviations from published clinical guidelines in other aspects of care, such as history and physical examination, diagnostic testing, lumbar radiography, and referrals to specialized care.

Guidelines emphasize the importance of a careful history and physical examination, concentrating on neurological deficit [5, 17, 26]. The importance of history taking for a correct diagnosis has been emphasized over skills in interpreting special investigations [14]. In the present study, however, underutilization rates of history and physical examination were very high (73% and 67%, respectively). Physicians working in primary health care centers in the Basque Health Service on average care for 41 patients per day, with a mean time per visit of less than 10 min [22]. These poor results may therefore be explained by a shortage of time in which to conduct at least a brief history and physical examination as well as recording the data obtained. It should be noted that patients without previous episodes of low back pain had a higher probability of history and examination, which indicates a more active

attitude for assessing danger symptoms or signs in patients presenting to the general practitioner with an initial episode of low back pain.

Plain radiography of the lumbar spine was substantially underutilized relative to suggested guidelines. Appropriate use of lumbar radiography in the index visit was found in 31% of cases – a much higher percentage than the 17–19% reported in other studies [29, 31] – which is consistent with our criterion of considering it appropriate not to require lumbar radiographs in the absence of “red flags” for spinal fracture, cancer, or infection in subjects aged over 50 years. Of the seven cases in which lumbar radiographs were required (spinal trauma in subjects over 50 years), radiographs were obtained in only one case (underutilization rate of 85.7%). In contradistinction, a 13% overutilization rate indicates that an important percentage of patients is being exposed unnecessarily to potential risks of ionizing radiation (lumbar spine X-rays involve 40 times the dose received during chest radiography) [31]. Our findings of underutilization and overutilization of plain radiography of the lumbar spine in the management of acute low back pain are consistent with results of other studies [29, 31]. Furthermore, avoidable costs were adversely affected by inappropriate use of lumbar X-rays.

Overutilization of specialized care referral (8%), although it was lower than that reported in other studies [29], may have important consequences for the patient as the starting point for unnecessary diagnostic tests (stoking fear beliefs about back trouble) [8] and unnecessary therapeutic interventions, including surgical treatment, which is carried out in 10% of patients referred to specialized care [38]. The effectiveness of most of these interventions

has not yet been demonstrated beyond doubt [33]. With regard to cost control, 54.5% of referrals to specialists could have been avoided. This situation is particularly unsatisfactory in our primary health care system, in which there are serious problems with the waiting list for consultations with specialists, with a mean (SD) waiting time of 30 (10) days for orthopedics.

The therapeutic management of low back pain varies widely. Since there is conflicting evidence regarding whether NSAIDs are more effective than analgesics for acute low back pain and strong evidence that various types of NSAIDs are equally effective [17, 33], drug treatment in primary care was not analyzed in the present study. Appropriate use of earlier mobilization (no prescription of bed rest or bed rest for less than 2 days) and educational advice – the only two factors that have been shown to exert a positive effect on the course of back pain [8, 13, 23, 35] – were analyzed. Suggested criteria for earlier mobilization and educational advice were met by 77% and 65% of patients, respectively. However, specific information on the favorable evolution of the disease was recorded in only 23% of cases. This is an important finding, because information and advice that health professionals give to patients based on traditional biomechanical concepts of spinal anatomy, adequate postures for activities of daily life, and specific back exercises have shown no significant impact on prognosis of the disorder, whereas it has been shown that clinical effectiveness and cost-effectiveness of nonspecific acute low back pain management can be improved by advice that departs from traditional orthopedic and physiotherapy information and focuses instead on the natural history and benign course of the disease, on patients' beliefs, and on what they themselves should do about their back pain [8, 11].

This study presents a descriptive evaluation of how acute low back pain is managed by physicians working in one primary care setting. The present results provide reliable information on the variability that exists worldwide for appropriateness of existing practice patterns according to recommendations from the medical literature. Our findings, however, should be interpreted taking into account certain characteristics of the study. Firstly, it is well known that observing a process alters the behavior of the people involved in the process. However, general practitioners were not aware of the aims of the study, did not participate in the assessment of eligibility criteria, and were only involved in the referral of patients to an interview after consultation. Therefore, there are no reasons to believe that

patients whose management could affect the results were systematically excluded. Secondly, there is always the possibility of a change in the physicians' approach to the management of acute low back pain, but this seems unlikely, because the study period was relatively short and no interventions related to the problem of low back pain were implemented in the participating practices. In addition, a specific training program for the care of patients with low back pain was not available at any of the participating practices. On the other hand, the study was not designed to determine knowledge of the existence and understanding of the contents of guidelines; however, it may be assumed that practitioners were familiar with US [5] and UK [17] clinical guidelines, given that references to these published guidelines are usually included in clinical practice manuals recommended by the most important scientific societies. Thirdly, underutilization of history and physical examination may have occurred, since these data were collected from the patients' medical records, and it is well known that less is recorded than is actually done [10]. This method, however, was considered more reliable than self-reported behavior, in which physicians' clinical practice tends to be presented in a more unrealistic way. The design of our study did not allow for any assessment on whether some general practitioners performed better than others, and whether performance could be related to age, special interest, or other factors. Further studies are needed to address this question and to collect information as to how the situation may be improved.

Conclusions

Management of acute low back pain in the primary care setting is not in conformance with published guidelines, with underutilization of history, physical examination and lumbar radiography being particularly marked. As a result, while some patients do not receive appropriate care, others may be exposed to the negative consequences of unnecessary tests and treatments [24]. Knowledge of the barriers to physician adherence to practice guidelines [9] can help researchers to design effective interventions to change physician practice.

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