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Assessing the Benefit of an Educational Program in a Rehabilitation Program over a Week in 99 Patients with Chronic Low Back Pain

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Abstract

Objectives: Some patients with chronic low back pain are not eligible to intensive rehabilitation program because of the intensity of their pain. We assessed the value of an educational program in a rehabilitation program over a week in chronic low back pain.

Methods: Patients aged 18 to 75 years with chronic low back pain were included. The rehabilitation program took place during a five-day hospitalisation in the rheumatology department of the Rouen University Hospital involving patients receiving multidisciplinary management with collective and individual workshops with special focus on education along with structured rehabilitation exercises. On the fifth day, patients and caregivers established goals to achieve within the six-month period. Patients had a follow-up visit six months later. The objective was to evaluate whether or not the goals were achieved at 6 months later.

Results: Ninety-nine patients were included, and 78 were re-evaluated after six months. The patients achieved 74% of the goals that they had established, with significant behavioural changes. Clinically and functionally: significant decrease in pain VAS during the program, significant decrease in the fingertip-to-floor distance during the program and at the 6 months follow-up, significant improvement in the functional questionnaire.

Conclusion: With to the educational part of their program, the patients achieved a mean of 74% of the goals. Moreover, the training course improved pain and function. For patients with a high level of pain and/or disability our short program with multidisciplinary management and an educational approach seems to be interesting as a first step before a more intensive rehabilitation.

Keywords: Chronic low back pain; Therapeutic education; Multidisciplinary management; Rehabilitation

Key Points

1. Some of the chronic low back pain patients rapidly develop a high level of chronic pain and disability and therefore are not eligible for back school and intensive back pain rehabilitation; for these severe patients, based on the European recommendations and the biopsychosocial model, we created a "low back pain" training session with a special reinforcement on therapeutic education.

2. The training session is a one week multidisciplinary management, with multiple individual and group workshops on the various aspects of the chronic low back pain and its consequences in the different aspects of life.

3. We asked patients to set goals to achieve by the sixth month following the training course in order to give them a starting point for following their efforts once they completed the week of training, the patients achieved a mean of 75% of the goals they had set individually.

4. After the week training session, the pain scale significantly decrease as well as the finger-to-floor distance, the modified Schober's test and the functional questionnaire (Roland Morris Disability Questionnaire and Dallas Pain Questionnaire)

Introduction

Low back pain is one of the major causes of disability in industrialised countries [1]. In France, the prevalence of low back pain, regardless of the duration of the episode, is 50% in the general population. The chronic form, which is defined as pain persisting for more than six months, only represents 10% of the back pain cases [2]. The lifetime prevalence of low back pain episodes in an individual varies from 39% [3] to 84% [4], depending on the study. Three major low back pain categories have been defined: low back pain that is symptomatic of an ailment, radicular low back pain and non-specific low back pain, which represents at least 90% of the cases [5].

There is high variability in symptoms and patients based on their own professional and psychosocial environments [6]. The European guidelines [4] recommend step I and step II analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) for short-term treatment. Anti-depressants and muscle relaxants can be used as co-analgesics. The non-medicinal treatments recommended are: patient home exercises learned from a professional, back schools, therapeutic

education, cognitive behavioural therapies and multidisciplinary rehabilitation according to the biopsychosocial model which integrates several treatment dimensions: clinical, psychological and social [7,8].

Some of these chronic low back pain patients rapidly develop a high level of chronic pain and disability and therefore are not eligible for back school and intensive back pain rehabilitation. For these more severe patients, based on these recommendations and the biopsychosocial model, we created a "low back pain" training session that integrates multidisciplinary treatment, therapeutic education, physiotherapy, occupational therapy role-playing, and if needed, management by a psychologist and/or a social worker.

The purpose of the information provided to patients was to limit the chronic nature of the pain and diminish morbidity by providing information on the disease, its prognosis and its evolution, as well as on treatments and their rational use [9]; the purpose of therapeutic education was for patients to acquire knowledge and be able to manage their chronic low back pain on a daily basis [8]. The physiotherapists aimed to teach patients rehabilitation exercises they could do at home. According to a systematic literature review [10], these exercises, which are taught under supervision, demonstrate a reduction in pain and disability compared with traditional treatments. Finally, the patients role played in various real life situations with an occupational therapist to do away with false beliefs and integrate their symptomatology into their daily life. Several teams have demonstrated the importance of these beliefs in the perception of pain and the importance of changing these beliefs when treating patients with chronic low back pain [11,12].

Therefore, the key objective of this study was to observe the behavioural modifications effected after achieving goals (personal and professional) established six months prior at the end of the training session. The secondary objectives were, on the one hand, to measure clinical changes: pain intensity and spinal stiffness from the beginning of the training session to the sixth month, and on the other hand, to determine whether or not there have been changes in functional questionnaires.

Patients and Methods

Patients

This was a prospective observational study conducted at the Rouen University Hospital from July 2009 to May 2013. Included were all patients aged 18 to 75 with chronic low back pain lasting for at least six months, who could not receive intensive rehabilitation at the Regional Centre for Physical Medicine and Rehabilitation due to the high level of pain and/or disability. The patients received written information on how the training session would proceed. They all provided their written consent.

This training session was a week-long hospitalisation from Monday (D1) to Friday (D5) to enable patients to become fully immersed. During this time, the patients received admission and discharge medical examinations as well as multidisciplinary management by rheumatologists, pain specialists, physiotherapists, occupational therapists, therapeutic education nurses, psychologists, dieticians and social workers. During the week, the various workshops included individual and group sessions that alternated.

On D1 for each patient, demographic data (age, size, weight, socioprofessional status, duration since onset of the symptoms) and medical data were collected: numeric pain scale (ranging from 0 (no pain) to 10 (worst pain imaginable)), finger-to-floor distance, Shober's test, modified Shober's test and patient's treatments upon admission.

The patients filled the validated French version [13-15] of the following functional pain questionnaires Health Assessment Questionnaire (HAQ), Roland Morris Disability Questionnaire (RMDQ), Fear Avoidance Beliefs Questionnaire (FABQ), Quebec Back Pain Disability Scale (QBPDS) and Dallas Pain Questionnaire (DPQ). On D1, in addition to the medical evaluation, the patients underwent an educational interview with a department nurse, trained to therapeutic education, using a semi-directive questionnaire incorporating six needs topics for the patient aimed to identify the specific needs of each patient (disease and/or treatment knowledge, personal needs, socioprofessional needs, psychological needs, healthcare needs). The patients also received a posture assessment with physiotherapists to identify the specific areas of rehabilitation needed by each different patient. At the end of the first day, the medical team got together to define individual needs from specific caregivers (psychologist, dietician, social worker).

At the end of the training course, on D5, the medical data were re-evaluated and compiled. The patients specified goals to be achieved in the six months following the training course (these goals were not predetermined, and could pertain to the patient's life, such as career path, physical activity, weight loss or leisure activities). These goals were re-evaluated, and sometimes completed by the multidisciplinary medical team before being discussed again with the patient.

Six months after the training course (M6), the patients were re-evaluated. The same clinical parameters were compiled (numeric pain scale, finger-to-floor distance, Schober's test and modified Schober's test). The same functional pain questionnaires were administered to the patients. The patient's current treatments were recorded. Finally, the D5 goals were reviewed to see if they were attained.

Statistical analysis

A descriptive analysis of the variables was performed, and included a description of patient numbers and frequencies for each of the observed modalities.

A per-protocol comparative analysis of the data from D1, D5 and M6 was performed.

In the absence of a normal distribution of values, the Wilcoxon test for comparing the medians of the quantitative variables was used and the Mac Nemar exact test was used for the qualitative variables.

Results

Population characteristics

The study included 99 patients, 50 of whom were men. The mean age was 47 years (25 years to 74 years) and the duration of the evolution of the symptoms ran from six month to 33 years, with a median of 7 years. The socioprofessional status of patients as well as their treatments are detailed in Table 1. After six months, 78 patients were re-evaluated, and 21 were lost to follow-up.

	N
Socioprofessional status	
Working	26

Therapeutic part-time	3
Sick leave	28
Occupational accident or illness	13
Disability category II (no professional activity)	13
Retired	9
Unemployed	7
Treatment on D1	
Step I	32
Step II	57
Step III	14
Muscle relaxant	27
Antiepileptics	25

Table 1: Socioprofessional characteristics and treatments of patients at the beginning of the training course (number of patients = 99).

Attainment of patient-caregiver goals

After the training course, the median number of goals established for each patient was 3 (0 to 5). At M6, it was observed that the median of the number of goals attained was 2 (0 to 5). By M6, the patients had attained a mean of 74% of the goals they had set. Some of the most common goals were: regularly performing exercises at home, weight loss, reduced medication intake, regular TENS use, engaging in more physical activity, partaking in family outings or leisure activities and making career progress.

Evolution of clinical and functional pain parameters

Following the evolution of the pain reveals a significant decrease in pain intensity between D1 and D5 (median numeric pain scale 6 vs. 4/10) (p<10-6). There is no difference between D5 and M6.

The finger-to-floor distance shortened during the training course from a median of 29 cm (0 – 84 cm) on D1 to 24 cm (0 – 50 cm) on D5 (p=0.0003), and then from 24 cm to 19 cm (0 – 57 cm) at M6 (p=0.001). From D1 to D5, the modified Shober's test score improved significantly, with the median passing from 5 + 2 cm (0 ± 7 cm) on D1 to 5 + 2.5 cm (0 ± 7 cm) on D5 (p=0.02). This improvement continued from D5 to M6, but not significantly (p=0.45) (Figure 1).

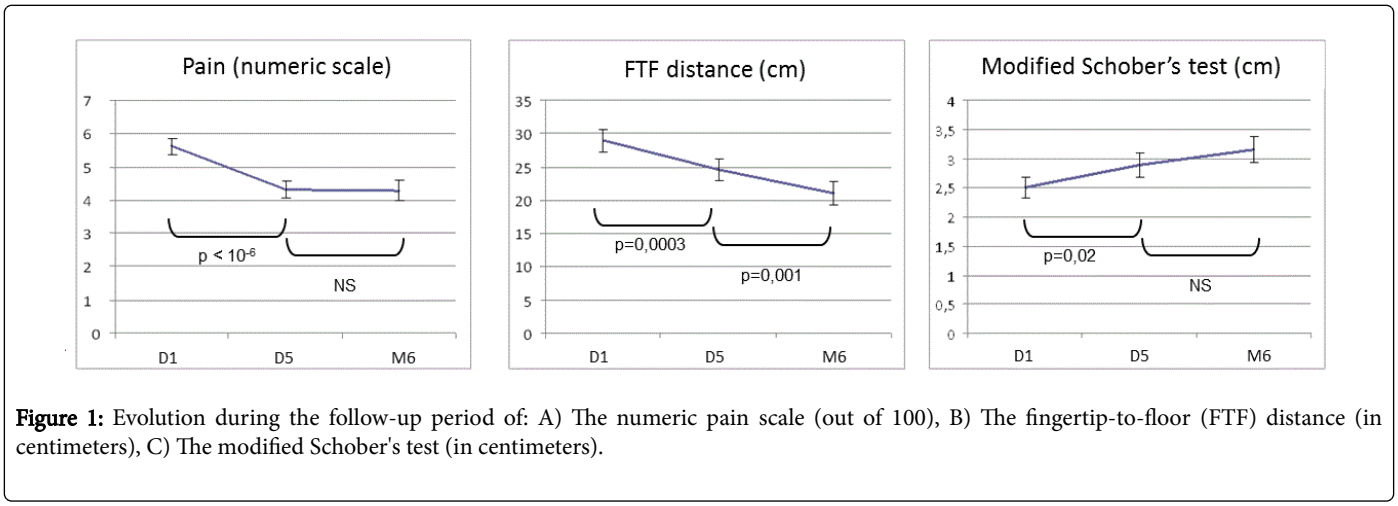

Figure 1: Evolution during the follow-up period of: A) The numeric pain scale (out of 100), B) The fingertip-to-floor (FTF) distance (in centimeters), C) The modified Schober's test (in centimeters).

Regarding the five functional questionnaires; there was a significant improvement between D1 and M6 in the Dallas Pain Questionnaire, for three of four areas: work and leisure (p=0.001); anxiety and depression (p=0,005) and social interest (p=0,001) (Table 2). Likewise, there was a significant improvement the results of the RMDQ (p=0.003) (Table 2).

	D1 (min-max)	M6 (min-max)	p
HAQ (score/3)	0.938 (0 – 2.5)	0.813 (0 – 2.38)	NS
RMDQ (score/24)	15 (1 – 23)	13 (0 – 27)	0.003
FABQ			
Physical activity (score/24)	15 (0 – 24)	16 (0 – 24)	NS
Work (score/42)	30 (5 – 42)	29 (0 – 42)	NS
QBPDS (score/100)	43 (2 – 77)	39 (0 – 83)	NS
DPQ			
Daily Living (%)	72 (15 – 100)	69 (0 – 93)	NS
Work and leisure (%)	55 (10 – 95)	45 (0 – 83)	0.001
Anxiety – Depression (%)	45 (10 – 85)	35 (0 – 89)	0.005
Social Interest (%)	35 (0 – 85)	30 (0 – 90)	0.001

HAQ: Health Assessment Questionnaire; RMDQ: Roland Morris Disability Questionnaire; FABQ: Fear Avoidance Beliefs Questionnaire; QBPDS : Quebec Back Pain Disability Scale; DPQ: Dallas Pain Questionnaire

Table 2: Comparison of the medians of each functional pain index during the follow-up period.

Evolution in prescriptions

Considering prescription, there was a downward trend with less treatment prescription. Between D5 and M6, there was an insignificant decrease in patients who resorted to step I, step III analgesics, muscle relaxants, a decrease of the significance limit for patients resorting to step II analgesics (p=0.057). There is a significant decrease in patients

treated with antiepileptics, the proportion of which decreased from 29.5% on D5 to 19.2% at M6 (p=0.008).

For TENS, 19.6% of patients used it prior to the TENS training course, while at the end of the course 96.2% obtained a prescription to rent a TENS when it was shown during the training course that it had visible efficacy.

In the next six months, the compliance rate was as follows: 72% of patients who had a prescription to rent a TENS were still using the device at M6.

Discussion

Many multidisciplinary programmes have been evaluated, but few focus on therapeutic education [16], which is effective on pain intensity and functional disability [17]. No significant difference was observed between these rather intensive treatments (39 hours a week for three weeks) and less intensive treatments administered over a longer duration (1.5 hours a week for eight weeks) [18]. Our programme is different from those that already exist since we mainly focus management on education and behaviour modification. We combine short-term treatment in the form of one single week of hospitalisation, unlike other programmes [19,20] with more medium-term treatment since patients are seen again after six months (in most other studies follow-up was more like three months later).

We asked patients to set goals to achieve by the sixth month following the training course in order to give them a starting point for following their efforts once they completed the week of hospitalisation. The patients achieved a mean of 74% of the goals they had set individually. We did not find any study in the literature that measured the achievement of individualised goals for each patient. One publication, Christiansen et al. [21], compared the treatment of chronic low back pain in a randomised study comparing traditional rehabilitative treatment in a group with the same kind of treatment combined with "mental contrasting" and "implementation intention" sessions (similar to motivational interviewing). The purpose the latter two methods is to increase patients' capacity to change behaviour and adopt new behaviours by establishing goals such as, "regularly exercising at home". The group that received the behavioural treatment demonstrated significant improvement in their physical capacities compared with the control group.

For therapeutic education, we implemented an initial educational diagnosis made by a nurse trained in administering therapeutic education. The patients then benefited from different possible modalities for this education, both in individual consultation and in group work, and finally, in workshops with specific themes (medication, fears and beliefs, TENS) [22]. This educational treatment is actually recommended [4] and demonstrated, even when patients only receive this education, efficacy on pain and function similar to what was seen with exercises [23] in a randomised, controlled trial. The combination of education and rehabilitative treatment demonstrated an improvement in symptoms that surpassed that of education alone and far surpassed no treatment at all [20]. This educational approach is the one most requested by patients [24].

Our treatment improved pain by 2 points on a 10-point scale, which can be considered clinically significant [25,26]. In addition, this improvement is close or even greater than that observed in other studies that integrate educational and rehabilitative treatment [19,20,23,27].

To this day, there are no specific guidelines on the type of at-home rehabilitative exercises that should be taught to patients [4,28]. We opted for stretching exercises and exercises to maintain range of motion with teaching on how to prevent lordosis. These exercises helped our patients significantly improve their lumbar flexibility.

The initial results of our patients on the FABQ and RMDQ functional questionnaires were similar to those observed in a population study [29]. In contrast, the DPQ results were not as high as those of the observational study. At the end of the follow-up, three of the four DPQ areas had improved significantly six months after the training course, implying a decrease in the impact of low back pain on several life areas for the patients. A significant decrease was also observed on the RMDQ, indicating a decrease in the functional repercussions of the symptoms. These results were already observed in another, randomised, controlled study, in which semi-intensive, multidisciplinary treatment was offered [19]. In this study, the RMDQ score improved significantly, as did the four DPQ components. At the end of this training course, however, our patients still had an elevated level of fears and beliefs despite the information and education received, with high medians of the two FABQ components. These results as well as those of the RMDQ questionnaire, whose median at the end of the follow-up period remained above 12, demonstrated the initial disability of our patients.

After six months, it is important to note the decrease in medicinal treatment of all types (step I, II and III analgesics, muscle relaxants, anti-epileptics). We discontinued treatments deemed ineffective or inappropriate in compliance with recommendations [4] and studies on the medicinal treatments used in chronic low back pain [30,31].

Our patients seemed to believe TENS to be effective since 70% were still using it after six months, even though currently it is not recommended for chronic low back pain treatment [4]. The most recent literature reviews mention that these European guidelines are not always in favour of the use of TENS in the treatment of chronic low back pain. For van Middelkoop et al., TENS has not proven its efficacy, whether versus placebo or versus other active treatments [10]. Likewise for the Cochrane literature review by Khadilkar et al. [32]. TENS did not prove its efficacy in a French multicentre, randomised, placebo-controlled study either [33]. Our study was not intended to evaluate the efficacy of TENS in chronic low back pain patients. Contrary to the literature, the compliance rate after six months indicates a positive effect of TENS in patient treatment. This effect may be positive because it is part of comprehensive treatment, while the majority of studies examine the use of TENS as monotherapy.

The strengths of our study were the offer of an innovative treatment to patients with pain and/or disability that is too severe for intensive rehabilitation program. We also offered medium-term patient follow-up with a six-month re-evaluation. Most of all, we provided refresher courses, if necessary, on at-home exercises, medication management and postural low back prevention in real-life situations. Our treatment provided a notable clinical improvement in pain. Finally, we asked patients to set specific goals to concretely re-evaluate the established behavioural changes. Therefore, these goals, which the patients established themselves, were customised, which motivated the patients and provided them with a sense of independence. The weaknesses of our study were, on the one hand, the absence of a control group, and on the other hand, an absence of any significant FABQ questionnaire results after six months despite the diverse information provided to patients during the training course.

Conclusion

Although uncontrolled, our study did provide multidisciplinary treatment to chronic low back pain patients with a severe pain and/or functional disability level. Our study effected behavioural changes. The patients attained 75% of the goals they established. Moreover, they benefited from medium-term follow-up thanks to the evaluation six months after completing the training course. Finally, this treatment significantly decreased pain, as well as the impact of low back pain on the various aspects of patients' lives.

These results should be validated in a controlled study to measure the impact of this low back pain training course on the patients.

Statement of Interest

The authors state no conflicts of interest for this research.

Credits

The authors thank the entire medical and paramedical team of the CHU de Rouen Rheumatology Department for their contribution to the successful administration of these low back pain training courses.

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