Long-term follow-up of patients with low back pain attending for manipulative care: outcomes and predictors

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Abstract

Psychosocial factors are known to act as obstacles to recovery from low back pain, but predictors of longer-term outcomes are not established. An average 4-year follow-up of a cohort of 252 low back pain patients attending for manipulative care was conducted to describe the longer-term course of low back pain, and to identify predictors of outcomes. Clinical and psychosocial data were obtained at baseline. Mailed questionnaires collected self-reported outcomes (pain, disability, recurrence and care seeking). Among the 60% who responded, the statistically significant reduction in mean Roland Disability Questionnaire score seen at 1 year did not improve further during follow-up. At the 4-year point, 49% of respondents reported residual disability, and 59% reported at least ‘mild’ pain. Symptom recurrence beyond the 1-year point was reported by 78% of respondents, with half of them seeking further care. Recurrence and care seeking were related to fear avoidance beliefs and duration of presenting symptoms. The disability score at 4-years was statistically significantly related to baseline depressive symptoms and higher pain intensity. Low back pain presenting for manipulative care is characterized by high levels of recurrence and care seeking over at least 4-years for many patients. Because psychosocial factors at presentation exert a long-term influence, they need to be considered by manual therapists.

Keywords: Care seeking; Low back pain; Manipulation; Outcomes; Predictors; Prospective; Psychological; Recurrence

1. Introduction

It is axiomatic that low back pain (LBP) continues to pose a problem for clinical management despite very substantial international research efforts. Nevertheless, it has been viewed as a largely self-limiting problem with a favourable prognosis (Indahl et al., 1995; Malmivaara et al., 1995; Royal College of General Practitioners, 1996), but that view is based largely on the outcome for the presenting spell at a discrete time point (typically at 12 months or sooner). By contrast, if the natural history of back trouble is considered not by reference to the presenting spell but to the lifetime experience, a different picture is suggested. LBP can be seen as a recurring phenomenon during life with varying degrees of pain and/or disability, although an individual spell may follow a short course (Weber and Burton, 1986; Deyo, 1993). Within the ranges illustrated by such models are those patients for whom short-term clinical management does not appear to pose a problem, but their longer-term prognosis may be less favourable. This view has been substantiated by a careful review of outcome studies in primary care, with the suggestion that definitions of acute and chronic based on a single episode are inadequate (Von Korff and Saunders, 1996). Seemingly, the general course of back pain is characterized by variability and change rather than predictability and stability, which may be reflected in patterns of care seeking.

Back pain patients generally do not consult their family doctor beyond the 3-month point yet a substantial proportion (75%) report continuing pain and/or disability at 1 year (Croft et al., 1998), and whatever improvement occurs during the first 2–3 months can be largely unchanged by 12 months (Wahlgren et al., 1997). Whilst studies with a follow-up in excess of 12 months are rare in primary care, studies in other health care settings (such as orthopaedics, group health
maintenance organizations, and chiropractic) have shown that recurrence of back pain beyond the 1-year point is not unusual (Campbell et al., 1989; Carey et al., 1999).

A range of factors has been found to be associated with back pain outcomes. The duration of symptoms preceding the initial visit, and subsequent physical therapy, have been associated with a poorer prognosis (van den Hoogen et al., 1997), whilst a duration of LBP in excess of 3 months before seeking health care has been associated with psychological distress (Waxman et al., 1998). Psychological factors are known to have a substantial influence on 12-month outcomes. Distress/depression and heightened somatic concern are strongly implicated in the transition from acute to chronic LBP (Pincus et al., 2002), whilst passive coping strategies and fear-avoidance beliefs are also considered to act as obstacles to recovery (Burton et al., 1995; Vlaeyen and Linton, 2000). The potentially important role of psychological and psychosocial factors in manual therapy has been comprehensively discussed previously (Main and Watson, 1999; Jones et al., 2002), but what remains unclear is precisely which factors are relevant in patients attending for manual therapy, and whether the effects are consistent and constant over time.

Our previously reported study of 1-year predictors of LBP outcome in a patient population attending for manipulative care (Burton et al., 1995) presented an opportunity further to explore the above issues. We elected to re-approach our patients with the aim of describing the course of symptoms and care seeking over a longer period in a cohort initially treated with an active management approach that included manipulative treatment. It was hypothesized that: (1) the overall pattern of disability due to low back pain would not change substantially between 1 and 4 years from presentation; (2) patients with a longer duration of symptoms prior to presentation would have a relatively poor longer-term outcome; (3) baseline psychological factors would be predictive of longer-term outcomes.

2. Methods

The detailed methodology for the 1-year follow-up period of this survey has been reported elsewhere (Burton et al., 1995), and so needs only to be described briefly here. The location was a private group practice specialising in manipulative (osteopathic) treatment, where sequentially attending patients \((n = 252)\) with a primary complaint of low back pain were enrolled; patients with ‘red flag’ indicators of serious spinal pathology (Royal College of General Practitioners, 1996) were excluded. At presentation, each patient completed a questionnaire to record a detailed history of low back pain, along with a structured clinical examination including clinical measures of back function, and standard orthopaedic tests. An assessment of present pain intensity was recorded using six verbal descriptors ranging from 0 = ‘no pain’ to 5 = ‘excruciating’, and a measure of self-reported back-related disability was obtained using the Roland Disability Questionnaire (RDQ), which has a possible score range of 0–24 (Roland and Morris, 1983). Patients also completed a battery of psychosocial instruments that explored a range of psychological parameters, including depressive symptoms, pain coping strategies, somatic perceptions, and beliefs. These instruments have been described in the previous report on this cohort (Burton et al., 1995).

The patients were treated with osteopathic manipulative therapy. Briefly, the treatments comprised a number of sessions (mean = 6.6) that variously involved passive soft tissue stretching, passive articulation of the lumbar spine and high-velocity thrust techniques. In addition, patients were given generally positive encouragement, and were advised to remain active and avoid rest so far as possible (in line with primary care guidelines (Royal College of General Practitioners, 1996)); there was no specific attempt either to assess or treat specific psychosocial factors.

The long-term follow-up was by mailed questionnaire. For logistic reasons patients were re-approached at a fixed point, resulting in data collection at an average four years since presentation (range, 3.5–5 years). This questionnaire was kept deliberately brief to encourage completion. It presented a number of multiple-choice items concerning the history of back trouble since the 1-year follow-up point, and sought to determine the frequency of recurrence along with details of any subsequent health care. Respondents were also asked to rate their present pain intensity and complete the RDQ. Of the original 252 patients, 186 (74%) responded at 1 year, and 151 (60%) responded at an average of 4 years.

Patients were categorized, as in our previous paper, as ‘acute’ (symptom duration for presenting episode of 3 weeks or less) and ‘non-acute’ (symptom duration greater than 3 weeks) (Burton et al., 1995).

Statistical treatment of the data included \(t\)-tests, \(\chi^2\) tests, and General Linear Model analysis. The level of statistical significance was set at 5%, whilst 95% confidence intervals (95% CI) were calculated where appropriate.

3. Results

The distribution of respondents’ RDQ scores changed substantially between baseline and 1 year, but essentially did not alter thereafter. From the approximately normal distribution at baseline (mean 8.7, SD 4.8), a substantial
shift towards lower RDQ scores was seen at 1 year (mean 3.4, SD 4.6) and at 4 years (mean 4.2, SD 4.8). For those responding at each follow-up point, the shift between baseline and 1 year (mean difference 5.3, 95% CI 4.5–6.2) was statistically significant, but that between 1 and 4 years (mean difference -0.5, 95% CI -1.3–0.3) was not. Respondents with a low RDQ score at the 1-year point were not necessarily those with a low score at the 4-year point: whilst 30% experienced an improvement, 42% experienced deterioration during that time. Taking the operational definition of ‘recovered’ (a score of 0–2 on RDQ) used in the previous paper (Burton et al., 1995), 41% of respondents had not recovered at 1 year and 49% had not recovered at 4 years. A small reduction in pain intensity occurred between 1 and 4 years (mean difference 0.1, 95% CI -0.1–0.3), which was not statistically significant. The majority of respondents who were not pain-free at either 1 or 4 years; 73% and 59%, respectively, still reported at least ‘mild’ pain. Viewed overall, at the 4-year point, 118 respondents (78%) reported at least some disability or pain.

Of the 151 patients who responded at 4 years, 119 (79%) reported experiencing further LBP after the 1-year point. Three categories of recurrence were defined based on recalled frequency of recurrence since 1 year: ‘no recurrence’ (0 spells), ‘recurrent’ (1–5 spells) and ‘persistent’ (more than 5 spells or persisting symptoms). At 4 years 65 patients (43%) reported a recurrent course, whilst 52 (35%) reported persistent trouble (Table 1). The likelihood of persistence of symptoms was related to the duration of symptoms prior to consultation for the index spell. Table 1 shows that of the patients presenting with a history in excess of 3 weeks (the non-acute group), 55% experienced persistent trouble between 1 and 4 years compared with 14% of those presenting within 3 weeks of onset (acute). Stepwise logistic regression was used to explore the capacity of the range of baseline historical, clinical, and psychosocial variables to predict recurrence (dichotomized as 0–1 spell and 2+ spells). The resultant model retained four statistically significant variables: longer duration of presenting symptoms, presence of leg pain, higher fear-avoidance beliefs, and heightened somatic concern.

Using general linear modelling and repeated measures analysis of variance, the effect of the duration of presenting symptoms (acute/non-acute) and previous history of LBP (yes/no) on respondents’ changes in mean RDQ over the four years was examined with age and sex as covariates. Fig. 1 shows that the acute patients had a better outcome than the non-acute patients at 1 year (mean difference 2.0, 95% CI 0.7–3.3), which persisted at 4 years (mean difference 1.51, 95% CI 0.7–3.7). Neither group changed significantly between 1 and 4 years (mean difference for acute -0.9, 95% CI -1.9–0.1; mean difference for non-acute -0.2, 95% CI -1.5–1.2). The presence or absence of a previous history of LBP had no statistically significant influence on 4-year outcomes.

Table 2 shows the pattern of care seeking between 1 and 4 years by the 50% of respondents who sought treatment for recurrence or continuing symptoms. Some 38% of this sub-cohort consulted their general practitioner, and most were referred for physiotherapy or for a hospital consultant’s opinion. Over 56%, though, returned to an osteopath on at least one occasion (almost always to their original osteopath). When the baseline variables were entered into a stepwise logistic regression model with future care seeking as the dependent variable, only a longer duration of presenting symptoms was retained as a statistically significant predictor. The mean RDQ scores at 1 and 4 years were not statistically different among the various care providers seen during the follow-up period.

The final phase of the analysis used stepwise multiple regression of respondents’ 4-year RDQ scores on the
The study had a number of limitations, the foremost of which is the limited response rate (60%) at the 4-year point, which impedes generalizability. It is recognized that testing effects can occur when participants have to repeatedly answer the same questions, which can lead to selective attrition, sensitization, and altered interpretation (Taris and Kompier, 2003). We do not believe this was a likely problem with the present study; participants were followed up at just two well-separated times, and somewhat different questions were used on each occasion. Although the 40% who did not respond at 4 years could not be distinguished from respondents on either baseline or 1-year data, they may have fared quite differently over longer follow-up, and the proportions might differ for the whole study population. Whilst the cohort of patients was drawn from fee-paying patients attending an osteopathic group practice, we have no reason to believe that their response is likely to be different from others offered similar treatment at a similar point in their clinical history.

The further care seeking by this cohort corresponds with previous reports of an increase in care seeking by patients receiving manipulative therapy during the 2–3 years after initial presentation (Meade et al., 1995; Carey et al., 1999). That over half of those who did seek care elected to return to the original osteopath variously can be viewed as a failure of manipulative care to solve the problem, or an endorsement of satisfaction with that longer-term pattern of symptoms, disability, and care seeking, and to determine the predictive capacity of baseline psychosocial variables for longer-term outcomes.

range of baseline variables, including demographic characteristics, clinical history, previous health care usage, clinical examination findings, back function tests, pain intensity, RDQ score, coping strategies, fear-avoidance beliefs, depressive symptoms and perception of somatic symptoms. The results are summarized in Table 3. Just two statistically significant variables were retained in the model, which together accounted for 26% of the variance in 4-year RDQ score. The single most explanatory variable was the presence of depressive symptoms (measured by the Modified Zung Depression Index (Main et al., 1992) accounting for 22% of the variance, with higher scores predicting relatively poor outcome; a higher baseline present pain intensity score explained the remaining 4% of the variance.

### 4. Discussion

This study is the first attempt to explore the course of low back pain in the manual therapy arena beyond the traditional 1-year follow-up period with a specific focus on the associations between presenting data and longer-term outcomes. The treatment approach used for the index spell is conducive with most national clinical guidelines (Koes et al., 2001), comprising general advice to stay active with the addition of manipulative treatment. The aim was to describe the resultant outcomes. The multivariable models for prediction of RDQ score at 4 years, based on values for baseline variables. Higher values of these variables predict higher 4-year RDQ score

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percent of variance accounted for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Modified Zung Depression Index score</td>
<td>22</td>
</tr>
<tr>
<td>Baseline Present Pain Intensity</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
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\( n = 123; \ F = 21.82; P < 0.001 \)

The previous report on this cohort, and data from general practice, have shown that a considerable proportion of patients with LBP continue to experience both symptoms and varying degrees of disability at 1 year (Burton et al., 1995; Croft et al., 1998). Based on 1-year outcomes in general practice, back pain has been described as ‘a chronic problem with an untidy pattern of grumbling symptoms and periods of relative freedom from pain and disability interspersed with acute episodes, exacerbations and recurrences’ (Croft et al., 1998). The results presented here indicate that picture apparently does not change over the ensuing 3–4 years. Indeed, recurrence and care seeking were common, and there was a trend for the present cohort, on average, to be marginally worse at 4 years in terms of disability. Stated simply, over three-quarters of respondents continued to report measurable pain and/or disability at 4 years, though they were not necessarily seeking care at that point. It is not possible to say whether the patients fared better or worse than they would solely under the care of their general practitioners, but it is clear that manipulative therapy did not lead to a complete resolution of back trouble for the majority of those responding at follow-up.

The study had a number of limitations, the foremost of which is the limited response rate (60%) at the 4-year point, which impedes generalizability. It is recognized that testing effects can occur when participants have to repeatedly answer the same questions, which can lead to selective attrition, sensitization, and altered interpretation (Taris and Kompier, 2003). We do not believe this was a likely problem with the present study; participants were followed up at just two well-separated times, and somewhat different questions were used on each occasion. Although the 40% who did not respond at 4 years could not be distinguished from respondents on either baseline or 1-year data, they may have fared quite differently over longer follow-up, and the proportions might differ for the whole study population. Whilst the cohort of patients was drawn from fee-paying patients attending an osteopathic group practice, we have no reason to believe that their response is likely to be different from others offered similar treatment at a similar point in their clinical history.

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### Table 2

<table>
<thead>
<tr>
<th>Care seeking between 1 and 4 years by the 76 patients who sought further care (50.3% of the 151 patients responding at 4 years)</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>General practitioner only</td>
<td>5</td>
<td>6.6</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>13</td>
<td>17.1</td>
</tr>
<tr>
<td>Hospital consultant</td>
<td>11</td>
<td>14.5</td>
</tr>
<tr>
<td>Osteopathy</td>
<td>43</td>
<td>56.5</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>5.3</td>
</tr>
<tr>
<td>Total</td>
<td>76</td>
<td>100</td>
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### Table 3

The multivariable models for prediction of RDQ score at 4 years, based on values for baseline variables. Higher values of these variables predict higher 4-year RDQ score

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care. It is not unreasonable to assume that patients returned to their osteopath because it helped them cope with their symptoms, despite the fact that it was incapable of altering what might be a natural pattern. Although patient satisfaction was not measured in the present survey, previous studies have suggested that satisfaction with manipulative care is high (Seferlis et al., 1998). Nevertheless, it is possible that the practice of providing manipulative treatment in spite of ongoing symptoms could impart inconsistent messages, thus contributing to the chronicity seen here; this notion deserves further exploration. It should be noted that over one-third of respondents with recurrence did not return for manipulative care, which variously could indicate unmet earlier expectations, a reflection of a deteriorating problem, or that they sought alternative care.

Factors predictive of longer-term prognosis, particularly factors that might act as obstacles to recovery, were a focus of the present survey. The clear detrimental effect of longer duration of symptoms on disability and recurrence supports similar findings from primary care outcomes at 1 year (Von Korff et al., 1993; Thomas et al., 1999). It might be tempting to infer that patients should be referred for manipulative therapy at an early stage of symptoms but that notion, whilst interesting, should be the subject of future research.

Of more practical interest is the role of psychosocial factors seemingly acting as obstacles to recovery, because there is emerging evidence that they are amenable to intervention (van Tulder et al., 2000; Vlaeyen et al., 2002). The findings from the present cohort are illuminating in this respect. Standard clinical examination data were unhelpful in the prediction of either recurrence or disability in the longer term, but the role of baseline psychological factors has been extended beyond their accepted role in the shorter-term to cover longer-term outcomes as well. The role of fear-avoidance beliefs and heightened somatic concern as determinants of recurrence in the longer term was a new finding, and shows their influence goes beyond the accepted relationship with short-term pain and disability outcomes. Psychological distress (in the form of depressive symptoms) emerged as the strongest single baseline predictor of 4-year outcome, and greatly exceeded the influence of pain intensity. In contrast to the previous report (Burton et al., 1995), the variables that best predicted 1-year outcomes (coping strategies—catastrophising and praying/hoping) did not have a significant influence in the longer term, suggesting that shorter-term ineffective coping strategies give way to depressive symptoms consistent with a model of learned helplessness (Main and Watson, 1999).

In summary, despite the acknowledged limitations of the study, there is a sobering message for the manual therapy professions. A high proportion of back pain patients attending for manipulative treatment will be unlikely to experience long-term resolution of symptoms and disability, and some will certainly deteriorate. That is not to say that manual therapy for back pain should be considered ineffective, but the results presented here do indicate that (as generally practiced) it is manifestly suboptimal for many patients. There is, however, an additional message lending empirical support to a recommendation that manual therapists need to understand the nature of patients’ pain behaviour and distress, rather than simply the nociceptive component of their pain (Main and Watson, 1999). The corollary is that manual therapists should consider incorporating management strategies focused on biopsychosocial principles (Jones et al., 2002; Main and Williams, 2002).

In view of the relatively powerful influence of psychosocial factors on back pain outcomes, there is now ample justification for trials of manual therapy with the inclusion of behavioural approaches to address psychological obstacles to recovery. Furthermore, the findings from the present survey are evidence that outcomes in back pain trials may best be measured by evaluating changes in the overall impact of the disorder over time, rather than by measures taken at a single time point.

References


