ELSEVIER

Physiotherapy 94 (2008) 21–28

Physiotherapy

A prospective study of patients with chronic back pain randomised to group exercise, physiotherapy or osteopathy

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Abstract

Objective To investigate the difference in outcome between patients treated with group exercise, physiotherapy or osteopathy.
Design Prospective study of patients referred at random to one of three treatments, with follow-up 6 weeks after discharge and after 12 months.
Setting National Health Service physiotherapy department at St Albans City Hospital, part of the West Hertfordshire Musculoskeletal Therapy Service.
Participants Two hundred and thirty-nine patients aged 18–65 years recruited from referrals to the physiotherapy department with chronic low back pain.
Interventions Eligible patients were randomised to group exercises led by a physiotherapist, one-to-one predominantly manipulative physiotherapy, or osteopathy.
Main outcomes Oswestry Disability Index (ODI), EuroQol-5D, shuttle walking test and patients' subjective responses to pain and treatment.
Results All three treatments indicated comparable reductions in mean (95% confidence intervals) ODI at 6-week follow-up: group exercise, −4.5 (−0.9 to −8.0); physiotherapy, −4.1 (−1.4 to −6.9); and osteopathy, −5.0 (−1.6 to −8.4). Attendance rates were significantly lower among the group exercise patients. One-to-one therapies provided evidence of greater patient satisfaction.
Conclusion The study supports the use of a variety of approaches for the treatment of chronic low back pain. Particular attention needs to be given to the problems of attracting enough participants for group sessions, as these can be difficult to schedule in ways that are convenient for different participants.

Keywords: Group exercise; Physiotherapy; Osteopathy; Chronic back pain

Introduction

Low back pain is a major health problem within Western industrialised populations. In recent studies, it was found that 5 million consultations with general practitioners (GPs) and 1.6 million hospital outpatient attendances in Britain were associated with chronic and acute low back pain. This translates to 180 million lost working days [1]. It is estimated that of an annual cost to the National Health Service (NHS) of £512 million, £150.6 million pays for physiotherapy alone [2].

There is much debate about the effectiveness of different treatment programmes, and despite an abundance of research, the UK BEAM trial suggested that the role of different physical treatments for back pain is unclear [3].

Many systematic reviews into the treatment of low back pain have been published. Evans and Richards investigated a wide variety of interventions. They suggested that physiotherapy and manipulative therapy did have therapeutic benefits [4]. Similarly, Van Tuldar and Boulter found that manipulation and exercise therapy had strong evidence in support of implementation for patients with chronic low back pain [5]. Koes *et al.* analysed the use of manipulation as an intervention to treat chronic low back pain, and suggested some benefits but with further research required [6]. This was supported by

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0031-9406/$ – see front matter © 2007 Published by Elsevier Ltd on behalf of Chartered Society of Physiotherapy.
doi:10.1016/j.physio.2007.04.014

Assendelft *et al.* in an analysis of spinal manipulation [7]. In a meta-analysis, Hayden *et al.* provided support for the use of exercises in adults with chronic low back pain, concluding that exercise decreased pain and improved physical function by modest amounts [8].

Many studies look for the most effective intervention over different time frames. Koes *et al.* suggested that, in the most effective treatments, the effects are only small and short term, and that there is insufficient evidence for longer-term effects [9]. The results of the UK BEAM trial suggest that exercise alone confers only short-term benefit but that manipulation confers longer-term benefit [3].

Departmental statistics show that the most common referral received by St Albans City Hospital Physiotherapy Department is for the patient with low back pain, with chronic low back pain being most prevalent. This department currently offers three treatment paths: group exercise; physiotherapy; and osteopathy. To date, few studies have compared osteopathic treatment with the approaches used by physiotherapists. Thus, the aim of the present study was to compare the effectiveness of these three physical therapy regimes for chronic low back pain within a single NHS trust.

Aims and methods

The research set out to examine two specific research questions:

1. Is physiotherapy-led group exercise as effective as one-to-one physiotherapy for patients with chronic low back pain?
2. Is one-to-one physiotherapy as effective as one-to-one osteopathy for patients with chronic low back pain?

Design and sample size

Eligible patients were allocated at random to one of three therapy regimes: group exercise; physiotherapy; or osteopathy. In order to address the two specific aims of the study, it was estimated that three treatment groups of approximately 110 subjects each would be required. This estimate assumed a standard deviation of 10 and a minimum difference in change in the Oswestry Disability Index (ODI) between treatment groups of four percentage points, with 80% power and 5% significance (with allowance for two planned comparisons). A reduction in ODI of four percentage points at 6 weeks after discharge is considered to be evidence of a clinically valuable difference between two therapy regimes [10].

Patients and recruitment

The sample of 330 patients was recruited from GP or hospital consultant referrals sent to St Albans City Hospital Physiotherapy Department. Patients were offered the opportunity to participate in the trial if they had suffered for more than 3 months with simple low back pain of musculoskeletal origin, without sciatic symptoms, and were aged between 18 and 65 years.

Exclusion criteria

- Aged 65 years or over.
- Serious spinal disorder, including malignancy, osteoporosis, ankylosing spondylitis, cauda equine compression and infection.
- Main complaint of pain below the hip.
- Previous spinal surgery.
- Additional over-riding musculoskeletal disorder.
- Attendance at or referral to a specialised pain management clinic.
- Medical condition (e.g. cardiovascular disease).
- Anticoagulant treatment.
- Steroid medication.
- Unable to get up from or down to the floor unaided.
- Physical therapy (including acupuncture) in the previous 3 months.

All patients meeting the criteria received a written invitation to take part in the study, and they were required to contact the department to book an appointment to attend an interview. At interview, patients were informed fully about the nature of the study before written consent was obtained. Patients who did not wish to take part were placed back on the normal waiting list.

Patients were assigned at random to one of the three therapy regimes by an independent administrator, using block randomisation methods to ensure approximately equal allocation of patients to each treatment. Random number sequences were generated from random number tables. Where feasible, individuals involved in the conduct and analysis of the study were blind to either group membership and/or baseline assessments. All follow-up assessments were undertaken by an independent assessor who was blind to baseline measurements and group allocation.

Measurements

A range of primary and secondary outcome measures was employed to assess each patient prior to intervention (baseline), at 6-week follow-up and 12 months after discharge. The ODI was the primary outcome measurement, which collects data on pain intensity and how this restricts activities of daily living. Fairbank and Pynsent [10] suggested that this is a valid and vigorous measure for low back pain and that it provides the 'gold standard' outcome measure. The ODI is a composite measure covering 10 possible aspects of pain and functional ability (each scored 0 to 5). The components are combined to generate a percentage scale from 0 (no disability) to 100 (extreme disability).

The EuroQol EQ-5D combines a visual analogue scale (VAS) of pain with a simple tick box questionnaire which

includes questions on mobility, self care, unusual activities, pain/discomfort and anxiety [11–13].

The shuttle walk test (SWT) is more commonly used for measurement in chronic obstructive pulmonary disorders, but has also been used in the measurement of chronic low back pain involved in a fitness programme [14]. The results of SWTs have been recorded as the highest level and total distance (in metres) completed over the test. The test involves 12 levels, each being taken at an increasing pace around two cones spaced 9 metres apart. A patient who completes all 12 levels is assumed to have covered a total distance of 1020 metres.

Additional questions covered both life satisfaction and satisfaction with the intervention that they had received. Hurwitz *et al.* investigated the link between satisfaction and clinical outcome using a larger but similar device [15].

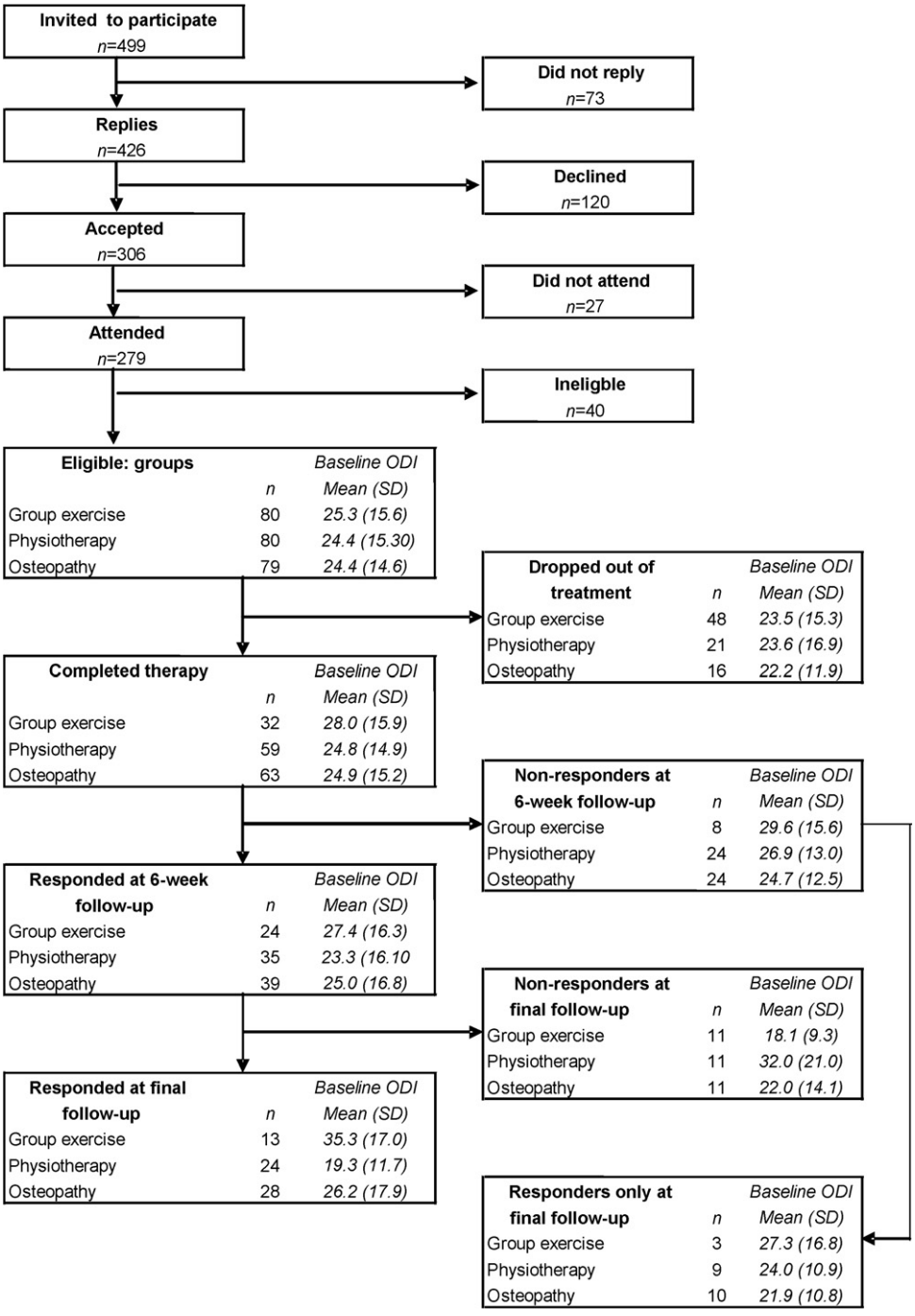

Fig. 1. Progression of participants through the study. ODI, Oswestry Disability Index; SD, standard deviation.

Conduct

In total, 499 referrals were received and contacted by letter by the trial administrator. Four hundred and twenty-six patients replied, of whom 120 declined to participate. A further 27 subjects failed to attend the assessment. Forty subjects were not eligible (32 on medical criteria and eight on age criteria). After randomisation, respective group sizes of 80 (group exercise), 80 (physiotherapy) and 79 (osteopathy) were achieved (Fig. 1).

The patients in each group were required to attend five treatment sessions within a 3-month period. Each session was approximately 30 minutes in duration, and the format of care was standardised as far as possible. Table 1 shows the treatment options utilised by each subgroup. It should be noted that each therapist did not necessarily use all of the interventions listed under each subgroup heading; rather, they chose which modalities they deemed most appropriate from that list. It should also be noted that there were several physiotherapists of the same grade providing treatment, and only one osteopath. This reflected departmental staffing levels.

All assessments and treatments took place in St Albans City Hospital NHS Physiotherapy Department. Data were collected from the department by an independent assessor. In most cases, the post-treatment follow-up assessments were arranged and were conducted in person.

The number of postal contacts at 6-week follow-up was limited (four out of 96). Attempts to increase the response rate at final follow-up led to greater use of postal and telephone contacts at this stage (five postal and 17 telephone contacts out of 86). These contacts have been excluded from some of the analyses.

The recruitment numbers were lower than anticipated, and were further reduced by patients who did not complete the treatment programme or who did not respond to follow-up requests. The subsequent progression of participants in each group at various stages in the study is evident in Fig. 1, which also contains the mean (standard deviation) ODI score at baseline for each subgroup.

Statistical analysis

All patient data were collated in Microsoft Excel. Analysis was undertaken using Statistical Package for the Social Sciences, Version 12 by a statistician who was blind to the identity of the three groups. Given the severe reduction in the number of participants with follow-up measurements at 6 weeks, the results of statistical analysis have been presented as key summary statistics with 95% confidence limits [16]. There are concerns regarding the occurrence of Type II errors in this study, and therefore conventional statistical tests have not been applied to avoid problems of interpretation of non-significant findings.

Results

Participants at baseline

Table 2 shows that patient randomisation yielded three groups that were highly comparable in terms of basic demography (age and gender) and assessed severity of health, according to the ODI and the two EuroQol measures (EQ-5D and Health Status VAS).

Completion of therapy regime

Patient attendance was monitored. The numbers and percentages completing the therapy regime by group are stated in Table 3. Group therapy had the worst attendance, with only 40% of patients completing all therapy sessions, compared with 74% within physiotherapy and 80% within osteopathy.

Gender and age were also examined. The effects on completion rates were relatively modest, with the exception of higher completion rates among female patients within osteopathy and older age groups within group exercise.

Investigation of the reasons for non-completion (Table 4) reveals that the high dropout rate of patients allocated to group exercise is largely attributable to problems with wait-

Table 1
Therapies given within manipulative physiotherapy, osteopathy and group exercise/rehabilitation treatment programmes

Manipulative physiotherapy	Osteopathy	Group exercise with a physiotherapist
Education/advice		
Joint mobilisation	Soft tissue massage	Problem identification
Soft tissue mobilisation	Soft tissue inhibition	Basic pathophysiology/anatomy/mechanics
McKenzie	Soft tissue stretch muscle energy	Home stretching exercise programme
Neural tension		
Manual traction	Articulation	Basic postural setting use of transversus, multifidus
Muscle imbalance	High velocity thrust – varying between minimal leverage and thrust and combined leverage and thrust	Circuits
Postural correction	Functional	Question and answer session
Isometric stabilisation exercises	Exercise advice	Re-assessment of subjective and objective markers
Global exercise for mobility	Education	
±electrotherapy	Discussion of psychosocial issues	
	Nutritional/dietary advice	

The manipulative therapists and the osteopath chose the most appropriate treatment for their patients from the above lists. The group exercise programme included all the topics in the above list.

Table 2
Baseline characteristics by treatment group

Baseline characteristics	Group exercise, $n = 80$	Physiotherapy, $n = 80$	Osteopathy, $n = 79$
Male (%)	45	38	43
Age: mean (SD)	42.5 (11.9)	44.3 (12.3)	43.5 (12.3)
Oswestry Disability Index: mean (SD)	25.3 (15.6)	24.4 (15.3)	24.4 (14.8)
Euro-Qol 5D: mean (SD)	0.64 (0.26)[a]	0.67 (0.25)	0.67 (0.24)[b]
Health Status VAS: mean (SD)	70.6 (18.6)[a]	68.4 (17.2)[b]	72.1 (16.5)[b]

SD, standard deviation; VAS, visual analogue scale.
[a] $n = 77$.
[b] $n = 78$.

Table 3
Numbers of participants assigned to treatment groups and completion rates

	Group exercise		Physiotherapy		Osteopathy	
	Allocated, *n*	Completed, *n* (%)	Allocated, *n*	Completed, *n* (%)	Allocated, *n*	Completed, *n* (%)
All patients	80	32 (40)	80	59 (74)	79	63 (80)
Males	36	14 (39)	30	19 (63)	34	22 (65)
Females	44	18 (41)	50	40 (80)	45	41 (91)
>35 years	25	8 (32)	20	16 (80)	26	22 (85)
35–49 years	26	10 (39)	28	20 (71)	24	17 (71)
50–65 years	29	14 (48)	32	23 (72)	29	24 (83)

Table 4
Reasons for non-completion by treatment group

Reasons for non-completion	Group exercise	Physiotherapy	Osteopathy
Appointment time/waiting problem	25	1	1
Discharged/did not attend	18	14	10
Other reasons	5	6	5
Total non-completers	48	21	16

ing and appointment times. Individuals who did not attend a session and did not subsequently contact the department were discharged, as local policy dictates. The 16 'other reasons' included six patients where further problems were identified, six patients who were unable to complete the course, two patients who received more than six treatment sessions, and one patient who was expecting surgery.

Principal outcomes at 6-week follow-up

Ninety-eight of the 239 (41%) eligible participants provided 6-week follow-up data. However, overall, 98 of the 154 (63%) patients who completed therapy responded to follow-up enquiries (75% for group exercise, 62% for osteopathy, 59% for physiotherapy).

In the three groups, there was a reduction in mean ODI score of a similar order of magnitude of four to five percentage points (Table 5), with 95% confidence intervals excluding zero for all groups. The differences in change in ODI score between the two pairs of treatment groups that were identified in the stated aims of the research are of a most modest scale, and considerably less than the four percentage points regarded as being of clinical value. The mean change among the group exercise participants exceeded that of the physiotherapy participants by 0.32 (95% CI −4.0 to 4.6). The mean change among the osteopathy participants exceeded the physiotherapy participants by 0.84 (95% CI −0.35 to 5.2). These estimates of mean difference are relatively imprecise. The standard deviation of difference was 9.1 for all participants at 6-week follow-up, in line with initial sample estimates. However, attrition to the initial sample resulted in relatively wide confidence intervals that, in fact, do not exclude the possibility of a difference of four percentage points between the two pairs.

This similarity between groups was also evident when comparing the two elements of the EuroQol health scale. Mean EQ-5D scores increased by around 0.1 for each group,

Table 5
Oswestry Disability Index and EuroQol outcomes at 6-week follow-up: mean [95% confidence interval (CI)] difference and standard deviation (SD) of difference from baseline to 6-week follow-up

Health scales	Group exercise			Physiotherapy			Osteopathy		
	n	Mean (95% CI)	SD	*n*	Mean (95% CI)	SD	*n*	Mean (95% CI)	SD
Oswestry Disability Index	24	−4.5 (−0.9 to −8.0)*	8.4	35	−4.1 (−1.4 to −6.9)**	8.0	39	−5.0 (−1.6 to −8.4)**	10.5
EuroQol									
EQ-5D	21	0.08 (−0.02 to 0.18)	0.19	35	0.10 (0.01 to 0.18)*	0.20	39	0.11 (0.02 to 0.19)*	0.24
Health status VAS	22	2.8 (−4.8 to 10.5)	17.2	33	4.8 (0.8 to 8.9)*	11.5	38	4.0 (−2.5 to 10.6)	19.9

Significance levels: paired *t*-test. * $P < 0.05$; ** $P < 0.01$.

Table 6
Changes in shuttle walk test (SWT) scores from baseline to 6-week follow-up by group and baseline SWT level

Changes in SWT scores	Group exercise	Physiotherapy	Osteopathy
n	21	31	38
Mean change	37	22	−24
Median change	0	0	0
Minimum	−160	−210	−700
Maximum	660	400	372

although the smaller sample size of group exercise participants influenced the precision of this estimate, with the 95% confidence intervals including zero. Changes in mean Health Status VAS were of the order of three to five percentage points, reaching significance among the physiotherapy group.

The SWT proved problematic for analysis of change, due largely to ceiling effects. Out of a total of 90 patients with baseline and 6-week SWT results, 31 completed 11 of the 12 levels at baseline, 27 of whom recorded the same level at 6-week follow-up. Hence the number of patients for whom improvement could be measured was greatly reduced. Table 6 shows a brief selection of descriptive statistics for mean, median and the range of change in SWT scores according to group.

Results from four questions requiring a subjective response, initially on a five-point scale, about symptoms and levels of satisfaction are summarised in Table 7, where the five response categories have been collapsed to three. Percentages at baseline and 6 weeks are stated for those participants with 6-week follow-up data. The percentage of patients reporting their low back pain in the past week as 'not at all bothersome' or 'slightly bothersome' increased across all treatment groups. Similarly, for all groups, there was an increase in the percentage of patients who responded 'not at all/a little bit' to the question about interference with normal work. Answers to the question about how participants would feel if they had to spend the rest of their lives with current symptoms revealed a decrease in the percentage of patients responding 'somewhat/very dissatisfied' for all groups. The proportions stating 'somewhat satisfied' or 'very satisfied' with overall medical care increased for all three treatment groups.

Evidence from final follow-up

As is evident from Fig. 1, only 65 participants had follow-up data at 6 weeks and 12 months (final follow-up). Table 8 examines the change in mean ODI score for the three groups separately from baseline to 6-week follow-up, and from 6-week to final follow-up. The evidence suggests that the decrease in mean ODI is generally sustained. The small sample sizes and substantial variability among individuals render the estimates of mean change rather imprecise, especially among the group exercise participants. Table 8 also contains a separate analysis excluding postal and telephone contacts for the 6-week to final follow-up period, given that greater use was made of such contacts at final follow-up. The effect of excluding these contacts has little observable effect on the magnitude of the mean ODI change.

Twenty-two participants who did not respond at 6-week follow-up did respond to enquiries at final follow-up. Since the analysis found little difference in ODI change at 6-week and final follow-up between the three treatment options, it is

Table 7
Patients' responses to questions on symptoms and satisfaction at baseline and 6-week follow-up

Patients' responses to questions on symptoms and satisfaction	Group exercise		Physiotherapy		Osteopathy	
	Baseline (%)	6 weeks (%)	Baseline (%)	6 weeks (%)	Baseline (%)	6 weeks (%)
Low back pain: bothersome?						
Not at all/slightly	17	46	29	63	38	54
Moderately	54	38	51	25	24	30
Very/extremely	29	17	20	13	38	16
Number of pairs	24		32		36	
Interference with normal work						
Not at all/a little bit	29	61	31	62	46	56
Moderately	33	9	26	15	13	13
Quite a bit/extremely	38	30	43	24	41	31
Number of pairs	23		34		39	
Life satisfaction with current symptoms						
Very/somewhat dissatisfied	88	75	69	35	82	55
Neither satisfied/dissatisfied	13	4	23	32	5	16
Somewhat/very satisfied	0	21	9	32	13	29
Number of pairs	24		34		38	
Satisfaction with medical treatment						
Very/somewhat dissatisfied	26	17	32	9	31	8
Neither satisfied/dissatisfied	35	21	26	12	29	5
Somewhat/very satisfied	39	63	42	79	40	87
Number of pairs	23		31		36	

Table 8
Change in mean Oswestry Disability Index (ODI) score for participants with full follow-up

Change in ODI score	Group exercise			Physiotherapy			Osteopathy		
	n	Mean (95% CI)	SD	*n*	Mean (95% CI)	SD	*n*	Mean (95% CI)	SD
All respondents									
Baseline to 6 weeks	13	−6.1 (−10.1 to −1.5)*	7.6	24	−4.0 (−7.6 to −0.5)*	8.3	28	−5.7 (−9.4 to −2.0)**	9.5
6 weeks to final follow-up	13	−1.6 (−9.5 to 6.3)	13.0	24	−0.8 (−3.7 to 2.1)	6.9	28	1.5 (−2.7 to 5.7)	10.9
Excluding post and telephone contacts									
6 weeks to final follow-up	11	−1.2 (−10.7 to 8.3)	14.1	19	−0.3 (−2.9 to 2.3)	5.4	25	1.1 (−3.6 to 5.8)	11.4

CI, confidence intervals; SD, standard deviation. Significance levels: paired *t*-test. * $P<0.05$; ** $P<0.01$.

worthwhile comparing this group with those who responded to follow-up at both 6 weeks and 12 months with respect to ODI change from baseline to final follow-up. Among patients with full follow-up ($n=65$), there was a mean change of −5.1 (95% CI −10.1 to −1.4), while those with final follow-up alone ($n=22$) revealed a mean change of −5.8 (95% CI −8.1 to −2.1). Given the proportion of postal and telephone contacts in the latter group, a similar analysis excluding such contacts revealed a mean change of −5.1 (95% CI −8.4 to −1.7) among participants with full follow-up ($n=55$), compared with a mean change of −9.6 (95% CI −16.6 to −2.8) among those with final follow-up alone. Hence there is little to suggest that participants with full follow-up contain an over-representation of cases with better outcomes.

Duration to final follow-up

It should be noted that duration to final follow-up varied, with median durations of 79 weeks, 68 weeks and 72 weeks for group exercise, physiotherapy and osteopathy, respectively. However, this variation does not appear to have had much effect on the mean change in ODI from baseline to final follow-up. Participants who attended final follow-up before 80 weeks ($n=61$) reported a mean change of −5.5 (95% CI −8.3 to −2.7), compared with −4.5 (95% CI −10.1 to 1.0) among participants who attended after 80 weeks ($n=24$).

Discussion

This study sought to assess the response of patients with chronic low back pain to each of the treatment regimes available at St Albans City Hospital. The study employed various assessment tools to measure current symptoms and response to therapy.

In terms of key health outcomes, the three groups reported comparable overall levels of change at 6-week follow-up. Mean ODI scores decreased from baseline to 6-week follow-up by around four or five percentage points, while mean EQ-5D scores increased by around 0.1 in all groups. The questions on satisfaction with symptoms and treatment at 6-week follow-up revealed comparable changes that reflected improved well-being for all three groups. Limited evidence from final follow-up suggested that the decline in mean ODI score had been sustained. The most striking difference between the three treatment regimes was in the proportion of participants who completed the course of treatment, which was significantly lower for group exercise.

The SWT was less sensitive to variations in symptoms than anticipated. High proportions of patients achieved maximum levels in the test on their first assessment, leaving no scope for improvement. Similarly, those at the lower end of the scale had little or no opportunity to record a decrease in score (i.e. both ceiling and floor effects). Also, the SWT required the patient to attend the department, which, as already stated, was a problem. Therefore, some modification of this tool would seem to be indicated for any such study in the future.

Limitations

The project had major problems with recruitment and retention of the sample. The poor attendance resulted in a reduction of statistical power to estimate the difference between therapies with the intended precision at outset. The low attendance was particularly noted in group therapy. This appeared to be due to logistical problems (inflexibility of times, etc.) rather than a reaction to the therapy itself.

The issues of attendance and drop out have to be acknowledged as resulting from the dual pressures of conducting a major investigation while continuing to provide treatments in a busy NHS department with waiting list pressures. Also, a lack of administration time for this project impacted on retrieval of the necessary follow-up statistics.

The dropout rate was lowest in the osteopathy group, especially within the female subgroup. The possible reasons for the difference in retention of patients have been considered. Suggestions were: that the osteopath had a more flexible schedule; that patients may have felt that the hands-on therapy was more effective within each session compared with the more exercise-based approach of physiotherapy; or personal characteristics or past experience within private practice.

The research has provided support for the approach to referrals for chronic low back pain taken at St Albans City Hospital. Treating patients with one or more of a range of therapies has a positive and measurable impact on response. This has strengthened the commitment of the St Albans City Hospital team to interdisciplinary collaboration.

In reality, the task of discriminating between single therapies lies beyond a single-centre project. The UK BEAM trial was a multi-centre study of 1334 patients, and concluded that

relative to 'best care' in general practice, manipulation followed by exercise achieved a moderate benefit at 3 months and a small benefit at 6 months [3]. Larger-scale studies are needed to measure the degree of benefit that one therapy has over another.

Conclusion

This study has not provided any evidence that any one single therapy confers therapeutic advantages over the others. There are issues with maintaining attendance at group exercise sessions. Overall, the levels of improvement as assessed by a decrease in mean ODI score are of a moderate level (four percentage points). Furthermore, in the absence of a control group, it was not possible to assess the possible contribution of spontaneous improvement over time.

The study department has gained consensus on the importance of a collaborative approach to patient management. Patients are offered a range of therapeutic options, including osteopathy. A unified approach is adopted and patients receive the same advice whenever they enter the system. This study has enhanced interdisciplinary working, and the department continues to use different therapy regimes or regime combinations to address, where feasible, the specific circumstances of individual patients.

Acknowledgements

The authors are indebted to the University of Hertfordshire Research Support and Development Unit for their tireless support.

Ethical approval: St Albans and Hemel Hempstead NHS Trust R&D Consortium (no. 107SAHH). West Hertfordshire Health Authority local research ethics committee (WHO33/98).

Funding: St Albans and Hemel Hempstead NHS Trust R&D Consortium.

Conflict of interest: None.

References

[1] DSS Analytical Services Division; 1999. Available at: http://www.backcare-helpline.org/pages/f_pages/facts2000.php Last accessed May 2006.
[2] Palmer KT, Walsh K, Bendall H, Cooper C, Coggon D. Back pain in Britain: comparison of two prevalence surveys at an interval of 10 years. BMJ 2000;320:1577–8. Available at: http://www.backcare-helpline.org/pages/f_pages/facts2000.php Last accessed May 2006.
[3] UK BEAM Trial Team. United Kingdom back pain exercises and manipulation (UK BEAM) randomised trial: effectiveness of physical treatments for back pain in primary care. BMJ 2005;329:13377–81.
[4] Evans G, Richards S. Low back pain: an evaluation of therapeutic interventions. Bristol: University of Bristol Health Care Evaluation Unit; 1996.
[5] Van Tulder M, Boulter L. Conservative treatment of acute and chronic non-specific low back pain: a systemic review of randomised controlled trials. Spine 1996;22:2128–56.
[6] Koes BW, Assendelft WJ, Vander Heijen GJ, Boulter LM. Spinal manipulation for low back pain: an updated systemic review of randomised controlled trials. Spine 1996;21:2850–71.
[7] Assendelft W, Morton S, Yu E, Suttorp M, Shekelle P. Spinal manipulative therapy for low back pain: a meta-analysis of effectiveness relative to other therapies. Ann Intern Med 2003;138:871–81.
[8] Hayden JA, van Tulder MW, Malmivaara AV, Koes BW. Meta-analysis: exercise therapy for non-specific low back pain. Ann Intern Med 2005;142:765–75.
[9] Koes BW, Van Tulder MW, Thomas S. Diagnosis and treatment of low back pain. BMJ 2006;332:1430–4.
[10] Fairbank J, Pynsent P. The Oswestry Disability Index. Spine 2002;25:2940–53.
[11] Williams A. The role of EuroQol instrument on QALY calculations. Discussion paper 136. York: University of York Centre for Health Economics; 1995.
[12] Williams A. The measurement and valuation of health; a chronical. Disscussion paper 136. York: University of York Centre for Health Economics; 1995.
[13] Frost H, Klaber Moffett J, Fairbank J. Randomised controlled trial for evaluation of fitness programmes for patients with chronic low back pain. BMJ 1995;310:151–4.
[14] Bradley J, Howard J, Wallace E, Elborn S. Reliability, repeatability and sensitivity of the modified shuttle test in adult cystic fibrosis. Chest 2000;117:1666–71.
[15] Hurwitz EL, Morgenstern HM, Yu F. Satisfaction as a predictor of clinical outcomes among chiropractic and medical patients enrolled in the UCLA Low Back Pain Study. Spine 2005;30:2121–8.
[16] Simon R. Confidence intervals for reporting results of clinical trials. Ann Intern Med 1986;105:429–35.