Mobilization and Manipulation for Low-Back Pain

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Mobilization and manipulation have been compared with placebo physiotherapy in patients with nonspecific back pain. Studies were conducted on 94 patients seen in general practice and 94 referred to hospital rheumatology and orthopaedic clinics for a specialist opinion. Assessments were performed immediately after the treatment course, two months later, and at one year. Most patients in both series showed improvements. In the general practitioner series, there was a slight but definite advantage in favor of those receiving mobilization and manipulation immediately after the course of treatment. However, these differences had largely disappeared at three months, and at one year the two groups were identifical. Analysis of the data indicated that clinical improvement correlated with the shorter length of history. No such advantage in favor of mobilization and manipulation was found in the hospital series. It is believed that this is because the hospital patients all had a longer duration of symptoms and a number of other features that were identified as being significantly worse. This study indicates the high rate of spontaneous resolution of low-back pain. In patients likely to improve anyway, mobilization and manipulation may hasten improvements but do not affect the long-term prognosis. [Key words: nonspecific low-back pain, mobilization, manipulation, long-term results]

DESPITE THE FREQUENT occurrence of back pain and the substantial morbidity and loss of work that it produces, objective data evaluating its treatment are few. This may be due to the difficulty in diagnosing the precise source of the symptoms, the difficulty in assessing the severity of the problem, and lack of knowledge of the natural histories of back-pain syndromes. Although the majority of attacks of back pain remit either spontaneously or following treatment, there is a very high incidence of recurrence. With the considerable variability in the course of the symptom complex it becomes essential to adopt the method of the controlled clinical trial to establish the value of any form of treatment. Selection of the clinical material must play a considerable role in determining the prognosis in any group of patients. It is likely that those patients seen in the community by their general practitioner are much more likely to get better quickly than those for whom a specialist opinion is required. For this reason, in any trial of treatment, it becomes important to consider separately patients with differing degrees of problems.

We report here on trials of treatment of nonspecific back pain based on a widely used form of mobilization and manipulation described by Maitland.[6] The study includes two separate population groups. The first is a series of patients with nonspecific back pain under the care of their general practitioners (primary care physicians), for whom a specialist opinion has not been sought (GP patients), and the second is a series of patients referred to hospital rheumatologic or orthopaedic

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Table 1. Randomization of Treated and Control Groups*

	GP†		Hospital	
	Treated	Controls	Treated	Controls
Age (years)	36.3 ± 11.6	38.7 ± 12.9	43.0 ± 11.8	42.3 ± 12.7
Sex (M : F)	33 : 14	32 : 15	31 : 17	24 : 22
Movements (degrees)				
Flexion	28.3 ± 10.7	28.5 ± 12.2	25.2 ± 13.6	21.7 ± 9.1
Extension	46.8 ± 10.4	44.4 ± 12.6	38.6 ± 10.0	39.1 ± 12.4
Right lateral flexion	28.5 ± 8.4	29.2 ± 11.2	26.3 ± 6.9	28.0 ± 10.5
Left lateral flexion	28.3 ± 6.3	29.8 ± 6.3	28.6 ± 6.2	27.3 ± 6.3
Right SLR‡	74.2 ± 14.3	75.7 ± 10.8	68.4 ± 18.9	73.4 ± 17.9
Left SLR	75.2 ± 14.7	74.4 ± 13.2	68.6 ± 18.2	75.1 ± 14.4

* There were no significant differences between treatment and control groups.
† Patients with nonspecific back pain under the care of their general practitioners, for whom a specialist's opinion has not been sought.
‡ Straight leg raising test.

clinics for a further opinion because of low-back pain (hospital patients).

MATERIAL AND METHODS

Patients. The general practitioner patients were of age 20–65 years with low-back pain sufficient for their physicians to request radiographs of the lumbar spine. It was a deliberate policy decision not to use every patient with back pain seen in general practice since so many have minimal or transient problems for which treatment is not indicated. The hospital patients were an unselected series referred to rheumatologic or orthopaedic clinics because of low-back pain.

All patients had to agree to attend physiotherapy sessions for one month and for all subsequent assessments. Patients were excluded from the study for the following reasons: inflammatory or other specific disorders of the spine, such as ankylosing spondylitis, Paget's disease, or vertebral collapse; bladder or bowel disturbances; previous spinal surgery; pregnancy; gross psychologic disturbances; other medical disorders that might contraindicate the forms of treatment used; and muscle wasting.

In addition the physiotherapist who was especially experienced in the application of these techniques was allowed to exclude patients if she thought they were unsuitable for this form of treatment. Patients with sensory abnormalities, loss of the ankle reflex, and muscle weakness without wasting were included.

Assessments. Clinical and radiographic assessments were performed prior to entry to the study, and repeat clinical assessments were performed at the end of the four-week course of treatment, two months later, and by postal questionnaire after one year. Patients who failed to reply to the questionnaire received a personal visit and interview.

The clinical assessments were performed by a physician without knowledge of which form of treatment was given. A detailed history and physical examination were performed with particular reference to the spine. Spinal movements and straight leg raising were measured using a spirit-level goniometer.[5,8] Radiographs of the spine were scored for changes in the intervertebral disc spaces, the vertebral end-plates, the presence of osteophytes, and apophyseal joint changes.

Treatment. In both studies the patients were allocated randomly to either mobilization and manipulation or placebo physiotherapy.

The program of mobilization and manipulation of the spine was based on techniques described by Maitland[6] which are widely used in many physiotherapy departments and was given by a physiotherapist with special experience in using these techniques. Detailed and repeated assessments of the spine are performed throughout the treatment program in order to localize the levels responsible for the symptoms. The treatments are directed at these levels, although inevitably adjacent levels will also be affected. Passive mobilization comprises oscillatory movements, including rotation techniques and accessory movements which are given in the posteroanterior or transverse directions. Intermittent or continuous traction is used alone or combined with mobilization and is directed at the pain-producing levels. Less often, manipulation techniques are used. These are small-amplitude, high-velocity movements going beyond the normal active ranges of motion. Abdominal

Table 2. Other Basic Characteristics Compared in Treated and Control General Practitioner (GP) and Hospital Patients*

Marital status
Physical activity
Duration of symptoms
Precipitating factors
Onset of symptoms—sudden or gradual stiffness of spine
Aggravation of symptoms by raising intrathoracic pressure
Night pain
Radiation into lower limbs (GP patients only)
Analgesic intake

* No significant differences emerged.

Table 3. Radiation into Lower Limbs (Hospital Patients)

	No Radiation	Above knee	Below knee
Treated	15	12	21
Controls	4	13	29

$\chi^2 = 6.08$; $0.05 > P > 0.01$.

Table 4. Similar Presenting Characteristics in General Practitioner and Hospital Series

Sex
Marital status
Precipitating factors
Onset of symptoms—sudden or gradual
Stiffness of spine
Aggravation of symptoms by raising intrathoracic pressure
Radiation into lower limbs
Analgesic intake
Spinal movements—right and left straight leg raising

and general active spinal exercises are given as thought necessary, and occasionally local heat is applied.

Placebo treatment was given by the same physiotherapist with comparable degrees of enthusiasm. It consisted of microwave radiation at the lowest possible setting given to the lumbar spine for 15 minutes with the patient prone unless this caused pain.

All treatments were given daily for the first week and then three times a week for a further three weeks. The treatment program could be stopped earlier if the symptoms were relieved or if they advanced so that other investigations or treatment were indicated.

RESULTS

Ninety-four patients entered each of the two trials and were randomly allocated to receive active or placebo therapies. Subsequent analyses showed that the randomization had resulted in comparable treatment groups (Tables 1 and 2) except that in the hospital series radiation of pain into the lower limb was significantly less frequent in the treated group than in the controls (Table 3).

The GP and hospital series were similar in the majority of their characteristics (Table 4), but the latter were significantly older (Table 5), more frequently restricted in activity (Table 6), had a longer duration of pain (Table 7), more frequently suffered from night pain (Table 8), had greater restriction of certain spinal movements (Table 9), and on radiographs showed a higher incidence of osteophytes around the L4–L5 and L5–S1 discs and apophyseal joint osteoarthrosis at L5–S1 (Table 10).

One-Month Assessment

Immediately after a four-week course of physiotherapy, 87 of the GP patients and 92 of the hospital patients attended for re-assessment.

Most patients in both groups thought that their symptoms were better (Table 11), that they were able to perform physical activity (Table 12), and that their treatment, whether active or placebo, was helpful (Table 13). However, in the hospital series the improvements were comparable in the treated and control groups, whereas in the GP series there was some advantage in favor of the treated patients. The ranges of spinal motion and straight leg raising at one month were compared with those recorded initially (Tables 14 and 15). The GP patients showed no change in flexion in the actively treated group but a significant decrease in the controls. Both active and placebo groups showed highly significant improvements in extension. There was no alteration in lateral flexion in either direction. Straight leg raising on both sides improved significantly in the actively treated group but not in the controls. In the hospital series there were no changes in spinal flexion but highly significant improvements in extension in both groups. There were no alterations in lateral flexion to either side but significant improvements in straight leg raising in the actively treated group.

The overall impression immediately after the four-week course of treatment was that both the GP series and the hospital series of patients were better than when first seen. However, the hospital series were not quite as well as the GP series. In addition, in the GP patients the improvements were slightly but definitely greater in those who had received mobilization and manipulation. No benefit from treatment was found in the hospital series.

Table 5. Ages of General Practitioner (GP) and Hospital Patients

GP	37.18 ± 11.88 yr
Hospital	42.63 ± 12.22 yr

$t = 3.08$; $P < 0.005$.

Table 6. Activity of General Practitioner (GP) and Hospital Patients

	Minimal	*Moderate*	*Very active*
GP	17	44	33
Hospital	21	55	18

$\chi^2 = 6.05$; $P < 0.05$.

Three-Month Assessments

All assessments were repeated three months after entering the trial, that is two months after the end of the course of treatment. Eighty-three of the GP patients and 82 of the hospital patients were re-assessed. The majority of patients were still improved in terms of subjective assessment of pain (Table 16), physical activity (Table 17), and opinion of the value of the treatment (Table

Table 7. Duration of Pain in General Practitioner (GP) and Hospital Patients

	Less than 1 month	*More than 1 month*
GP	21	73
Hospital	9	85

$\chi^2 = 4.80$; $P < 0.05$.

Table 8. Pain at Night in General Practitioner (GP) and Hospital Patients

	Night pain	No night pain
GP	30	64
Hospital	43	51

$\chi^2 = 4.39$; $P < 0.05$.

Table 9. Spinal Movements in General Practitioner (GP) and Hospital Patients

	GP	Hospital	t	P
Flexion	29.0 ± 11.1	23.9 ± 13.8	2.79	< 0.01
Extension	45.6 ± 11.5	37.6 ± 13.1	4.34	< 0.001
Right lateral flexion	28.9 ± 10.0	26.2 ± 9.8	1.85	NS
Left lateral flexion	28.9 ± 6.2	27.2 ± 7.4	1.70	NS

18). The treated and control groups showed similar results except that in the GP group the patients receiving mobilization and manipulation more often thought their treatment helped than did the controls, the difference being of borderline statistical significance. In the GP groups the treated subjects showed improvements in extension and left lateral flexion. The controls also had improved extension but decreased flexion (Table 19). The hospital patients receiving mobilization and manipulation showed a significant improvement in extension and the controls in extension and left lateral flexion (Table 20).

The overall impression was that at three months both GP and hospital patients were better than when first seen. The hospital patients still showed no differences between those receiving mobilization and manipulation and those receiving placebo therapy. The small differences in favor of the treated group of GP patients at one month had largely disappeared.

One-Year Assessment

Information was obtained from 90 of the GP patients and 80 of the hospital patients. The majority of the patients thought that their backs were better than when first seen (Table 21). The GP patients were somewhat better than the hospital patients. No differences between the treated and control groups were found in the GP patients, but in the hospital series the controls were significantly better than the treated group. Many patients in both series had some limitations of physical activities due to their backs (Table 22). These changes were similar in both treated and control subjects. When asked their opinion of treatment, the majority of patients thought that it was of some temporary value (Table 23). No differences were noted between the GP and hospital patients nor between results whether they had received mobilization and manipulation or placebo therapy.

Overall, at one year the majority of patients were better than when first seen but still had significant disability due to back pain. No differences were found between the patients receiving mobilization and manipulation and those receiving placebo therapy.

Prognostic Factors

The clinical and radiologic data were examined in an effort to identify presenting features that might act as a guide to the likely prognosis. The only correlation found was in the GP group in comparing the 30 patients who improved best with those who were worse immediately after the course of treatment. Those with a preceding history of pain duration of less than one month more frequently improved than those with a history of pain duration of greater than one month (Table 24).

DISCUSSION

Although in some cases it is possible to identify the cause of back pain, in the majority the diagnosis is in doubt. It seems preferable to label these patients as having "nonspecific back pain" rather than to use terms which seem to have pathologic implications, such as "fibrositis," "lumbosacral strain," "sacroiliac stain," etc., for which there is no pathologic basis. Nonspecific back pain must include many different conditions, but with new diagnostic techniques it should become pos-

Table 10. Radiologic Changes in Hospital (H) Patients and General Practitioner (GP) Patients

	Osteophytes			Disc narrowing			Disc calcification			Disc gas			Apophyseal osteoarthrosis		
	H	GP	P	H	GP	P	H	GP	P	H	GP	P	H	GP	P
L1–L2	25	13	NS	5	4	NS	2	0	NS	4	0	NS	9	5	NS
L2–L3	33	21	NS	9	7	NS	3	0	NS	3	0	NS	17	16	NS
L3–L4	43	29	NS	15	19	NS	3	0	NS	2	1	NS	48	39	NS
L4–L5	62	23	<0.001	32	26	NS	4	0	NS	2	1	NS	76	67	NS
L5–S1	36	4	<0.001	51	36	NS	3	0	NS	2	1	NS	77	52	<0.001

Table 11. Subjective Assessment of Pain at One Month

Patient group	Improved			Nonimproved			P
	Completely better	Much better	Slightly better	No change	Slightly worse	Much worse	
General Practitioner							
Treated	6	18	15	2	1	1	> 0.1
Controls	3	20	9	6	4	2	
Hospital							
Treated	4	13	12	12	4	2	NS
Controls	1	14	10	13	4	1	

sible to separate out various specific entities. Because nonspecific back pain includes a number of different conditions, one must expect that some may respond well to any form of therapy and others may not, thus making it difficult to identify the particular value of the treatment.

Manipulation and mobilization of the spine is widely used for treating back pain, yet its value is in dispute, and various mechanisms by which it may relieve symptoms have been suggested. For example, Mathews and Yates[7] suggested that a posterior disc bulge might be reduced by rotational manipulation tightening the posterior longitudinal ligament, thus exerting a centripetal pressure on the protrusion. Although this might relieve symptoms during the manipulation, it is difficult to see how it could provide long-term relief. Other possibilities include freeing adhesions around a prolapse and mechanically stimulating large nerve fibers, thus inhibiting transmission of nociceptive impulses through small-diameter nerve fibers.

The high incidence of spontaneous remission occurring following placebo therapy indicates that acceptable studies of the value of manipulation must be conducted in a controlled fashion. Without such control data, it is clear that it is impossible to assess the true value of any form of treatment.

Previous studies of hospital patients included a multicenter comparative trial of manipulation, physiotherapy excluding manipulation, corset, and analgesics.[2] All the different groups responded similarly, although some patients seemed to respond quickly and well to manipulation. However, the trial was criticized as the forms of manipulation used at various contributing centers dif fered. Evans et al[3] performed a crossover trial comparing three rotational manipulations at weekly intervals with analgesics alone. Although they found improvements in certain parameters during the manipulation period, the design of the study made analysis and interpretation of the results difficult as for some patients the control period was the first form of treatment and for others it followed manipulation.

Two studies were performed on subjects working in factories and developing back pain. Glover[4] compared manipulation with detuned short-wave diathermy. Although many who were manipulated obtained immediate relief, within a few days there were no differences between the two groups. Bergquist-Ulmann and Larsson[1] compared spinal mobilization, instruction on the care of the back, and placebo physiotherapy. Mobilization and instruction were better than placebo in a number of parameters but overall did not differ from each other.

The form of treatment used in the present trials was based on that described by Maitland[6] and is in general use for low-back pain. There are many other forms of mobilization and manipulation, and they may be practiced in different ways by physicians, surgeons, physiotherapists, and other practitioners. As in any practical procedure, there is considerable scope for individual variation. Clearly caution is indicated in drawing broad conclusions on the values of mobilization and manipulation from any study.

Table 12. Physical Activity at One Month

Patient group	Working		Unable to work	P
	Completely normal	Restricted activity		
General practitioner				
Treated	22	16	5	> 0.05
Controls	19	11	14	
Hospital				
Treated	19	14	13	NS
Controls	20	8	15	

Table 13. Patients' Opinions of Treatment at One Month

Patient group	Helped		No help		P
	Very helpful	Some help	Useless	Made it worse	
General practitioner					
Treated	23	15	2	3	> 0.05
Controls	19	12	13	0	
Hospital					
Treated	19	17	9	3	NS
Controls	13	15	16	0	

Table 14. Spinal Movements Compared with Initial Values at One Month in General Practitioner Patients

	Treated			Controls		
	Initial	1 month	P	Initial	1 month	P
Flexion	29.07 ± 10.53	27.77 ± 9.53	> 0.1	29.11 ± 11.94	26.45 ± 10.46	< 0.05
Extension	46.70 ± 10.21	52.81 ± 13.90	< 0.001	44.70 ± 12.59	51.77 ± 12.92	< 0.001
Right lateral flexion	28.49 ± 8.78	29.47 ± 5.70	> 0.1	27.64 ± 6.35	26.14 ± 7.86	> 0.1
Left lateral flexion	28.30 ± 6.43	29.67 ± 6.03	> 0.1	29.14 ± 5.45	28.09 ± 7.86	> 0.1
Right straight leg raising	73.15 ± 14.56	79.20 ± 13.34	< 0.01	76.88 ± 9.38	78.58 ± 10.63	> 0.1
Left straight leg raising	73.98 ± 15.29	79.73 ± 10.89	< 0.01	75.25 ± 13.23	76.35 ± 14.76	> 0.1

Table 15. Spinal Movements Compared with Initial Values at One Month in Hospital Patients

	Treated			Controls		
	Initial	1 month	P	Initial	1 month	P
Flexion	25.25 ± 13.57	24.00 ± 10.30	> 0.1	21.39 ± 8.98	22.75 ± 9.62	> 0.1
Extension	38.58 ± 10.03	42.96 ± 9.09	< 0.005	38.95 ± 12.65	44.43 ± 11.38	< 0.001
Right lateral flexion	26.31 ± 6.86	28.17 ± 5.63	> 0.1	28.00 ± 10.76	26.80 ± 7.50	> 0.1
Left lateral flexion	28.56 ± 6.22	29.90 ± 6.10	> 0.1	27.20 ± 6.45	28.16 ± 6.31	> 0.1
Right straight leg raising	68.38 ± 18.88	74.02 ± 15.38	< 0.05	73.36 ± 18.03	75.39 ± 17.60	> 0.10
Left straight leg raising	68.56 ± 18.24	73.19 ± 17.00	= 0.05	75.39 ± 14.71	74.18 ± 15.97	> 0.10

Table 16. Subjective Assessment of Pain at Three Months

	Improved			Nonimproved			
Patient group	Completely better	Much better	Slightly better	No change	Slightly worse	Much worse	P
General practitioner							
Treated	6	10	10	6	3	5	
Controls	3	12	7	9	7	5	NS
Hospital							
Treated	4	15	9	7	7	0	
Controls	5	14	8	6	6	1	NS

Table 17. Physical Activity at Three Months

	Working			
Patient group	Completely normal	Restricted activity	Unable to work	P
General practitioner				
Treated	25	9	5	
Controls	19	13	11	NS
Hospital				
Treated	26	8	8	
Controls	23	10	7	NS

Table 18. Patients' Opinions of Treatment at Three Months

	Helped		No help		
Patient group	Very helpful	Some help	Useless	Made it worse	P
General practitioner					
Treated	18	14	7	1	
Controls	17	8	15	3	< 0.1
Hospital					
Treated	19	9	10	3	
Controls	14	11	11	1	NS

In the general practitioner study, we found that most patients improved. Immediately after treatment there were small but definite advantages in favor of those receiving mobilization and manipulation. These differences were less marked two months later, and at one year there were no differences between the two groups. The patients who did best were those with a shorter duration of symptoms. The results suggest that mobilization and manipulation have a limited capacity to hasten the resolution of symptoms although not affecting the long-term prognosis.

In the study of patients referred to specialist rheumatology and orthopaedic clinics in hospital because of low-back pain, again we found a high rate of improvement after the course of treatment, but we were unable to identify any advantage for patients receiving mobilization and manipulation. It is to be expected that patients referred for a specialist opinion would have a longer duration and more severe symptoms than those being cared for by their general practitioners. This was confirmed on analysis of the data. However, several

Table 19. Spinal Movements Compared with Initial Values at Three Months in General Practitioner Patients

	Treated			Controls		
	Initial	*3 months*	*P*	*Initial*	*3 months*	*P*
Flexion	29.28 ± 9.56	28.28 ± 8.96	> 0.1	28.86 ± 11.83	25.47 ± 11.28	< 0.01
Extension	46.25 ± 9.89	49.88 ± 11.38	< 0.05	44.81 ± 12.80	48.53 ± 13.09	< 0.05
Right lateral flexion	27.90 ± 8.48	29.33 ± 7.49	> 0.1	27.77 ± 6.39	27.49 ± 7.45	> 0.1
Left lateral flexion	27.93 ± 6.35	30.80 ± 5.35	< 0.01	29.35 ± 5.50	28.58 ± 5.24	> 0.1
Right straight leg raising	75.53 ± 12.52	78.60 ± 15.15	> 0.1	76.56 ± 9.28	76.47 ± 13.26	> 0.1
Left straight leg raising	75.05 ± 15.53	77.95 ± 15.13	> 0.1	74.58 ± 13.48	75.81 ± 14.70	> 0.1

Table 20. Spinal Movements Compared with Initial Values at Three Months in Hospital Patients

	Treated			Controls		
	Initial	*3 months*	*P*	*Initial*	*3 months*	*P*
Flexion	26.29 ± 13.41	26.83 ± 9.41	> 0.10	21.36 ± 9.23	22.46 ± 9.43	> 0.10
Extension	38.12 ± 10.00	43.43 ± 9.93	< 0.005	40.74 ± 11.21	44.00 ± 11.85	< 0.05
Right lateral flexion	26.14 ± 6.98	28.81 ± 6.65	> 0.05	29.08 ± 10.77	29.21 ± 7.20	> 0.10
Left lateral flexion	28.41 ± 6.38	29.38 ± 5.87	> 0.10	28.21 ± 5.67	30.74 ± 6.29	< 0.05
Right straight leg raising	67.19 ± 19.35	72.48 ± 16.83	> 0.10	76.20 ± 13.95	78.85 ± 12.61	> 0.10
Left straight leg raising	67.88 ± 18.44	73.10 ± 17.07	> 0.10	77.43 ± 13.56	78.00 ± 13.24	> 0.10

Table 21. State of Back at One Year Compared with Initial Presentation

Patient group	*Better*	*Same*	*Worse*	*P*
General practitioner				
Treated	30	11	4	NS
Controls	28	12	5	
Hospital				
Treated	15	15	9	< 0.01
Controls	29	9	3	

Table 22. Physical Activity Limited by Back at One Year

Patient group	*Not at all*	*Slightly*	*Seriously*	*P*
General practitioner				
Treated	13	23	9	NS
Controls	10	29	5	
Hospital				
Treated	6	23	10	NS
Controls	5	27	9	

Table 23. Subjective Opinion of Treatment at One Year

Patient group	*Lasting value*	*Helped at the time*	*No value*	*P*
General practitioner				
Treatment	13	21	11	NS
Control	11	30	4	
Hospital				
Treatment	5	26	8	NS
Control	14	17	8	

Table 24. General Practitioner Patients: Immediate Prognosis and Length of History

	Less than one month	*More than one month*
Improved	10*	20*
Nonimproved	1*	29*

* Fisher's exact $P = 0.0004$.

other features were identified as being significantly worse in this series than in the GP series.

The differing results between the two series emphasize the importance of defining the population of patients in conducting trials of any form of treatment. It seems probable that mobilization and manipulation will hasten improvements that are likely to occur anyway. The failure to demonstrate any advantage from mobilization and manipulation in the hospital series is probably due to the patients likely to benefit being those most likely to improve spontaneously and being selected out by the delay before being referred to the specialist clinic.

Overall the results suggest that most sufferers from nonspecific back pain obtain relief without mobilization and manipulation. However, this form of treatment may hasten improvement, particularly in patients with the shorter length of history of symptoms. However, it makes no difference to the long-term prognosis.

It is disappointing that we were unable to identify prognostic markers other than a shorter duration of history. Such markers would be helpful not only in managing individual patients but also in leading to a better understanding of the pathogenesis of back pain syndromes.

REFERENCES

1. Bergquist—Ulmann M, Larsson U: Acute low back pain in industry. Acta Orthop Scand (Suppl) 1970:9–117, 1977
2. Doran DML, Newell DJ: Manipulation in the treatment of low back pain—a multi centre study. Br Med J 3:161–164, 1975
3. Evans DP, Burke MS, Lloyd KN, Roberts EE, Roberts GM: Lumbar spine manipulation on trial. Rheumatol Rehabil 17:46–53, 54–59, 1978

4. Glover JR, Morris JG, Khosla T: Back pain: A randomised clinical trial of rotational manipulation of the trunk. Br J Indust Med 31:59–64, 1974
5. Loebl WY: Measurements of spinal posture and range of spinal movements. Ann Phys Med 9:103, 1967
6. Maitland GD: Vertebral manipulation. Fourth edition. London, Butterworths, 1977.
7. Mathews JA, Yates DAH: Reduction of lumbar disc prolapse by manipulation. Br Med J 3:692–693, 1969
8. Reynolds PMG: Measurement of spinal mobility: A comparison of three methods. Rheumatol Rehabil 14:180–185, 1975

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