Systematic reviews of bed rest and advice to stay active for acute low back pain

GORDON WADDELL

GENE FEDER

MOISHE LEWIS

SUMMARY

Background. *In the United Kingdom (UK), 9% of adults consult their doctor annually with back pain. The treatment recommendations are based on orthopaedic teaching, but the current management is causing increasing dissatisfaction. Many general practitioners (GPs) are confused about what constitutes effective advice.*

Aim. *To review all randomized controlled trials of bed rest and of medical advice to stay active for acute back pain.*

Method. *A systematic review based on a search of MEDLINE and EMBASE from 1966 to April 1996 with complete citation tracking for randomized controlled trials of bed rest or medical advice to stay active and continue ordinary daily activities. The inclusion criteria were: primary care setting, patients with low back pain of up to 3 months duration, and patient-centred outcomes (rate of recovery from the acute attack, relief of pain, restoration of function, satisfaction with treatment, days off work and return to work, development of chronic pain and disability, recurrent attacks, and further health care use).*

Results. *Ten trials of bed rest and eight trials of advice to stay active were identified. Consistent findings showed that bed rest is not an effective treatment for acute low back pain but may delay recovery. Advice to stay active and to continue ordinary activities results in a faster return to work, less chronic disability, and fewer recurrent problems.*

Conclusion. *A simple but fundamental change from the traditional prescription of bed rest to positive advice about staying active could improve clinical outcomes and reduce the personal and social impact of back pain.*

Keywords: low back pain; bed rest; activity.

Introduction

LOW back pain now accounts for 4% of primary care consultations, 5% of hospital outpatient referrals, and 14% of Department of Social Security benefits for chronic incapacity. Nine per cent of adults consult their family doctor annually with back pain in the UK.[1] The most common management of back pain and sciatica is still to prescribe analgesics and advise rest, and to treat acute attacks with bed rest.[2,3] This recommendation is based on orthopaedic teaching, but there are increasing doubts and dissatisfaction with current management.[4,5] Many GPs do not give advice on daily activities to patients with back pain and there is confusion about what constitutes effective advice.[6]

Two key trials by Gilbert *et al*[7,8] and Deyo *et al*[9] first showed that longer periods of bed rest have no advantage compared with shorter periods. The 1994 clinical guidelines recommend that bed rest should be for short periods of 2–4 days, and they still advise activity limitation.[4,10] More recently, even short periods of rest have come under question.[11,12] This review considers whether any bed rest is beneficial and if patients with acute back pain would be better advised to stay active.

The aim of the study was to review all randomized controlled trials of bed rest and of medical advice to stay active for acute back pain.

Methods

Selection of studies

We searched MEDLINE and EMBASE from 1966 to April 1996 for published studies. Advice on activity is not indexed on bibliographic databases and cannot be identified by surrogate terms such as 'usual care', 'exercise', or 'therapy'. Therefore, we reviewed abstracts of all randomized controlled trials of back pain treatment, based on the search terms 'back-pain' or 'low back-pain', and 'randomized-controlled-trial' or 'controlled-clinical-trial'. 'Bed rest' was used to search for studies where bed rest was one treatment arm. Complete citation tracking with no time limit from these trials and previous reviews[13,14] was supplemented by ISI Science and Social Sciences Citation Indices, correspondence with experts, and a personal bibliography. Correspondence with back pain researchers in Europe and the United States of America aimed to identify additional published and unpublished studies

Two reviewers selected trials to be included in the reviews using the following criteria:

- A main symptom of back pain of up to 3 months duration, including trials mainly of patients with pain for up to 3 months or which presented results for these patients separately. Recurrent attacks, acute exacerbations of chronic back pain and sciatica were included.
- All trials of bed rest, regardless of setting. Trials of advice about activity had to be set in primary care (i.e. health care settings of 'first contact', not requiring specialist referral) including general or family practice, osteopathy, chiropractic, or occupational health practice.
- The experimental or control intervention consisted of bed rest for one review and specific medical advice on maintaining normal activity levels for the other. Formal exercise programmes, back schools, and educational leaflets were excluded.
- Trial subjects 18 years of age or older.

Assessment of methodological quality

The methodological quality of each trial was assessed independently by two non-blinded reviewers (GF and ML) on a scoring system that has been used in a number of systematic reviews of back pain management.[14,15] Disagreements were resolved by discussion, followed by adjudication by the third reviewer if necessary. We compared our score with a previous review[15] of some

G Waddell, DSc, MD, FRCS, orthopaedic surgeon, The Glasgow Nuffield Hospital, Glasgow; G Feder, MD, FRCGP, senior lecturer in general practice; and M Lewis, MA, DO, MRO, research fellow, Department of General Practice, St Bartholomew's Medical College, London.
Submitted: 14 October 1996; accepted 17 March 1997.

of the trials by comparing mean scores and testing for rank order (Spearman's rank correlation).

Outcome measures

We analysed the main patient-centred outcomes in the trials including rate of recovery from the acute attack, relief of pain, restoration of function, satisfaction with treatment, days off work and return to work, development of chronic pain and disability, recurrent attacks, and further health care use. Eligibility for inclusion in our reviews required at least one of these outcome measures.

Some trials also recorded objective physical measures of lumbar flexion and straight leg raising.

Results

We identified 10 trials of bed rest[7-9,11,16-22] and eight trials of advice to stay active[11,12,22-28] which met the inclusion criteria. Two of these trials directly compared bed rest and advice to stay active[11,22] and were included in both reviews. We excluded a further six closely related trials because they did not fully meet the inclusion criteria (Table 1).[29-34]

Methodological quality

Table 2 lists the methodological criteria. Scoring independently, the two reviewers agreed on 80% of the 465 individual methodological sub-scores. Most of the disagreements were caused by differences in interpretation of the criteria. After discussion, they agreed on all but two which required adjudication (Table 3).

Five out of the 10 trials of bed rest and six out of the eight trials of advice to stay active scored 50% or more, which is arbitrarily taken by van Tulder *et al*[15] to be of high quality. Eight of the trials have also been reviewed by van Tulder *et al.*[15] Our scores differed from theirs, although their scores also differed from those published previously by their own group.[14] Our scores were higher (mean 58.2 ± 12.4 compared with 44.9 ± 16.7), but our rankings were similar (Spearman's rank correlation coefficient = 0.72; $P < 0.05$). Most of the discrepancy arose from how the criteria were interpreted and applied.

Outcomes

Table 4 presents the review of bed rest with the trials, patients, settings, interventions, main outcomes, and results. Table 5 presents the review of advice to stay active.

Two of the trials of bed rest need to be considered separately. Pal *et al*[19] showed that bed rest with continuous traction gave no benefit over bed rest with sham traction, but did not provide any information on the effect of bed rest itself. The trial by Wiesel *et al*[17] was on young male army recruits under army discipline in a tightly controlled setting. The subjects, setting, interventions, and outcomes were all atypical and cannot be generalized to the general back pain population in primary care, which probably explains why its results are different from all the other trials.

All the remaining eight trials of bed rest (Table 4) showed that bed rest was not effective. Two trials[9,21] showed that longer periods of 7 days bed rest were no different from shorter periods of 2–3 days. Five trials[7,11,18,20,22] showed that short periods of 2–4 days were no different or worse than no bed rest. Bed rest was not significantly different from placebo[18,20] or no treatment.[7] It was either no different or less effective than the alternative treatments with which it was compared for rate of recovery,[7,11,16,22] relief of pain,[7,11,16,18,20,21] return to daily activities,[7,9,20] and days lost from work.[7,9,11] Recovery of objective clinical measures was no different.[20-22] There were no direct comparisons of bed rest in hospital and at home, but the trial of bed rest in hospital[19] failed to demonstrate any value.

The only trial of bed rest for 'sciatica'[16] was an early trial of poor methodological quality, but suggested that bed rest was not as effective as epidural anaesthesia.

All eight trials of medical advice to stay active, encourage physi-

Table 2. Methodological scoring. (Reproduced with permission from Koes & van den Hoogen 1994.)

Criteria	Weight
Study population:	
(A) Homogeneity	2
(B) Similarity of relevant baseline characteristics	5
(C) Randomization procedure adequate	4
(D) Drop-outs described for each study group separately	3
(E) < 20% loss to follow-up	2
< 10% loss to follow-up	2
(F) > 50 subjects in the smallest group	6
> 100 subjects in the smallest group	6
Interventions:	
(G) Interventions included in protocol and described	10
(H) Pragmatic study	5
(I) Co-interventions avoided	5
(J) Placebo controlled	5
Effect:	
(K) Outcome measures relevant	10
(L) Blinded outcome assessments	15
(M) Follow-up period adequate	5
Data presentation and analysis:	
(N) Intention-to-treat analysis	5
(O) Frequencies of most important outcomes presented for each treatment group	5
Total possible score	100

Table 1. Trials excluded from the reviews.

Trial	Reason for exclusion
Bed rest	
Morrison *et al* 1988	Randomized and controlled, but no comparable results given
Advice on activity	
Bergquist-Ullman & Larsson 1977	Back school
Overman *et al* 1988	Comparison of physical therapist and physician care
Linton *et al* 1989	Secondary prevention in subjects with a history of back pain
Kellett *et al* 1991	Secondary prevention in subjects with a history of back pain
Gundewall 1993	Prevention of back pain

Table 3. Methodological scores of included trials in hierarchial order.

Criteria	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Total
Possible score	2	5	4	3	4	17	10	5	5	5	10	15	5	5	5	100
Malmivaara *et al*[11]	2	5	4	2	2	8	10	5	3	5	10	12	3	0	5	76
Gilbert *et al*[7]	2	5	0	2	4	8	10	5	3	0	10	12	5	0	5	71
Deyo *et al*[9]	1	5	4	2	2	8	10	5	3	0	10	12	3	5	0	70
Lindquist *et al*[23]	2	4	2	1	4	0	10	5	3	0	6	9	5	0	5*	56
Wilkinson[22]	2	4	4	2	2	0	10	5	5	0	6	6	3	0	5	54
Indahl *et al*[12]	2	2	3	0	4	17	5	5	0	0	2	3	5	0	5	53
Pal *et al*[19]	1	2	0	3	4	0	10	0	0	5	8	8	5	0	5	53
Fordyce *et al*[24]	2	3	2	0	0	0	10	5	3	0	8	9	5	0	5	52
Lindstrom *et al*[27]	2	2	4	3	4	8	10	5	0	0	4	3	2	0	5	52
Wiesel *et al*[17]	2	0	0	3	4	0	10	5	5	0	4	3	3	5	5	49
Linton *et al*[28]	1	2	0	2	0	0	10	5	3	0	6	9	5	0	3	46
Postacchini *et al*[20]	2	1	0	0	2	0	10	5	0	5	8	6	5	0	0	44
Szapalski & Haylz[21]	2	4	4	2	2	0	10	5	0	0	4	6	3	0	0	42
Coomes[16]	2	3	2	3	4	0	5	5	0	0	4	0	3	5	0	36
Rupert *et al*[18]	2	4	0	0	0	0	10	5	0	5	2	3	3	0	0	34
Philips *et al*[25]	1	0	0	2	0	0	10	5	0	0	2	3	2	0	2*	27

*Adjudication required.

cal activity, and continue ordinary daily activities as normally as possible showed consistent findings, though different trials used different outcomes (Table 5). This advice made little if any difference to the pain[11,23-25,28] or to initial recovery,[11,22,23,25] but despite this, patients were more satisfied with their treatment.[23,28] Three trials showed that advice to stay active led to faster return to work[11,12,26] while one found no significant difference.[23] All the trials that considered chronic disability[12,24-28] and health care use for back pain in the next year[24] showed that these outcomes were reduced. There was no evidence that early activity had any harmful effects or led to more recurrences. Three trials showed that patients advised to stay active had less time off work in the next year.[23,26,28]

The two trials that directly compared advice to stay active with bed rest[11,22] were both of high quality and showed that ordinary activity produced faster recovery.

Both reviews showed consistent findings across high and low quality trials and in separate analyses of high quality trials. We did not undertake meta-analysis because of the heterogeneity of the outcome measures and lack of sufficient statistical detail in the published reports.

Discussion

The theoretical arguments against bed rest and for the management of back pain by activity have been reviewed elsewhere.[13,35,36] These two reviews now present strong empirical evidence. Multiple trials show that bed rest is not an effective treatment but may delay recovery. Although only two of the bed rest trials were based on formal power calculations and some were under-powered, most trials — regardless of methodological quality (including size) — showed some detrimental effect of bed rest, and all but one showed no beneficial effect.

Patients with acute back pain may have to modify their activities and some patients may be confined to bed for a few days, but that should be seen as an undesirable consequence of their pain and not a treatment. Multiple trials show that advice to stay active and to continue ordinary activity as normally as possible is likely to give faster return to work, less chronic disability, and fewer recurrent problems.

These conclusions are supported by evidence from other contexts. Careful assessment, adequate explanation and reassurance can produce positive shifts in patients' beliefs about back pain and improve their satisfaction with health care.[37-39] Conversely, 'labelling' can do powerful harm.[40,41] Systematic reviews show the benefits of back schools and that active exercise therapy is effective for chronic low back pain.[15] Three randomized controlled trials show that active exercise programmes may reduce recurrences in people with a previous history of back pain.[32-24] Physical training can increase patients' perceptions of their own ability.[42]

Although there are no randomized controlled trials of medical advice about work for patients with back pain, there is other evidence that advice to return to work as early as possible may reduce work loss both initially and over the next year.[43] There is conflicting evidence on whether advice to return to temporary modified work is associated with earlier return to work,[44] makes little difference,[45] or actually acts as a barrier to return to work.[40] Early return to work does not appear to increase the chance of recurrence.[23,27,28,45] People who are active and physically fit get fewer and shorter recurrent attacks.[32-34,46]

Is our review relevant to primary care patients? Although only two out of the 10 trials of bed rest were set in general or family practice, another five were in American or European ambulatory care, which is a comparable primary care setting. In only one of the bed rest trials were patients actually admitted to hospital for the 'treatment'. Four out of the eight activity trials were set, at least in part, in family practice, and the others were settings that can be described as primary care. In most of the trials, advice was given by generalists and were not dependent on the participation of physical therapists or specialists. Most of the trials recruited both men and women, with an average age between 32 and 43 years; with the exception of the trial in a military setting where the average age was 23 years. Therefore, we think that the findings of the detrimental effect of bed rest and the beneficial effect of activity in acute back pain are highly relevant to general practice, with the caveat that the unemployed and older patients are not well represented in most of the trial populations.

There are limitations to our reviews, particularly that of advice on activity. This question was not directly addressed in many trials and is not indexed in the databases, which creates problems in identifying relevant studies and deciding which to include or exclude. The overall quality of the trials was reasonable, but could still be improved.[15] The shortcomings included small sample sizes, insufficient detail about randomization and co-interventions, unblinded assessment of outcomes, and no intention-to-treat analysis. Methodological scoring depends on the criteria used, and on how these criteria are interpreted and applied,[49] but despite this, it is reassuring that our overall findings and conclusions are very similar to van Tulder *et al.*[15] Ideally, the reviewers

Table 4. Evidence table of randomized controlled trials of bed rest for acute back pain or sciatica in order of methodological score.

Study	*n*	Patients	Setting	Intervention	Control(s) (c)	Follow-up	Outcome measures	Results*
Malmivaara *et al* 1995[11]	186	Acute back pain (average 5 days)	Occupational health clinics	2 days bed rest	c1. Back mobilizing exercises c2. Ordinary activity	3 and 12 weeks	Rate of recovery Pain Disability Satisfaction Days off work Flexion and SLR	Worse Worse Worse NS Worse NS
Gilbert *et al* 1985[7] Evans *et al* 1987[8]	252	Acute back pain (average 35 days)	Family practice	4 days bed rest	c1. Physiotherapy and education c2. No treatment (factorial design)	10 days, and 6 and 12 weeks	Rate of recovery Pain Disability Flexion and SLR	NS NS Worse NS
Deyo *et al* 1986[9]	203	Acute back pain (78% < 30 days)	Hospital walk-in patients	7 days bed rest (actual average 3.9 days)	2 days bed rest (actual average 2.3 days)	3 weeks and 3 months	Disability Satisfaction Days off work Flexion and SLR	NS Worse NS NS
Wilkinson 1995[22]	42	Acute back pain (< 7 days)	Family practice	48 h bed rest (actual average daytime rest 12.6 h)	Stay mobile and no daytime rest (actual average daytime rest 6.1 h)	7 and 28 days	Rate of recovery Disability Flexion and SLR	Slower (NS) Worse (NS) Worse (NS)
Pal *et al* 1986[19]	41	Back pain and sciatica	Admitted to hospital	Bed rest and continuous traction	Bed rest and 'sham traction'	1 and 2 weeks	Pain Return to work SLR and neurology	NS NS NS
Wiesel *et al* 1980[17]	80	Acute back pain	Army medical service	Bed rest 'til ready for full duties	Kept ambulatory, restricted duties	15 days	Rate of recovery Pain Days off work	Faster Better Better
Postachinni *et al* 1988[20]	398	Acute back pain ± radiating pain (male)	Hospital out-patients	20–24 hours/day bed rest for 4–6 days, 15–20 hours/day for next 2 days	1. Manipulation 2. NSAIDs 3. Physiotherapy 4. Placebo	3 weeks, and 2 and 6 months	Combined score Pain, disability & spinal movement	Worse than c1 Equal to c 2 and c3, better than c4 at 3 weeks only
Szpalski & Hayez 1992[21]	51	Acute back pain	Hospital out-patients	7 days bed rest	3 days bed rest	1, 5 and 9 days	Pain Isostation B200	NS NS
Coomes 1961[16]†	40	'Sciatica' (average 34 days)	Hospital out-patients	Bed rest at home*	Epidural anaesthetic, no advice regarding bed rest	Weekly for 10 weeks	Rate of recovery Pain	Slower Worse
Rupert *et al* 1985[18]†	145	Separate data on acute (< 30 days)	Hospital	Bed rest c/o orthopaedic specialist *	1. Manipulation 2. Sham manipulation	2 weeks	Pain	Worse than c1 NS c2

*NS: No significant difference. Outcomes are significant ($P < 0.05$) unless otherwise stated. †Originally the control group.

would have been blinded to the authors and the outcomes of the trials during scoring, but resources did not permit the employment of 'blind' reviewers. Despite these methodological problems, the consistency of the findings across most of the trials allows us to draw robust conclusions.

Despite widespread practice, there is little evidence available on bed rest for patients with nerve root pain or disc prolapse, which must be clearly distinguished by history and examination from non-specific back pain with referred leg pain.[4] What evidence there is questions the efficacy of traditional bed rest for sciatica.[16,19,20] We need further trials of bed rest for the minority of patients with disc prolapse.

Our review supports advice in the national *Clincial guidelines for the management of acute back pain* to avoid bed rest if possible and to encourage patients with back pain to remain active.[47] We do not understand the aetiology of non-specific low back pain, nor why there is such an increase in chronic low back disability in the Western world despite lack of evidence of any change in the pathology or prevalence of back pain.[4,5] Yet medical advice to rest or to stay active is potentially one of the most

Table 5. Evidence table of randomized controlled trials of advice on activity for acute and sub-acute back pain in order of methodological score.

Study	*n*	Patients	Setting	Intervention	Control(s)	Follow-up	Outcome measures	Results
Malmivaara *et al* 1995[11]	186	Acute back pain (average 5 days)	Occupational health clinics (Finland)	'Ordinary activity', avoid bed rest, continue routine activity as normally as possible	c1. Back mobilizing exercises c2. 2 days bed rest	3 and 12 weeks	Rate of recovery Pain Disability Satisfaction Days off work	Better Better Better NS Better
Lindequist *et al* 1984[23]	56	Acute back pain ± referred leg pain	Family practice (Sweden)	Back school, physiotherapy training programme, encourage physical activity despite back pain	Analgesics PRN, advice not to strain back	Initial recovery, 1 year	Rate of recovery Days off work Satisfaction Recurrences 1 year sick leave Chronic disability	NS NS Better Fewer and shorter (NS) Less (NS) NS
Wilkinson 1995 [22]	42	Acute back pain (< 7 days)	Family practice (UK)	Stay mobile and no daytime rest	48 h strict bed rest	7 and 28 days	Rate of recovery Disability Flexion and SLR	Faster (NS) Better (NS) Better (NS)
Indahl *et al* 1995[12]	975	Back pain, off work for 8–12 weeks	Population-based: NI claims (Norway)	Intense personal advice, reduce fear, activity, normal walking, reduce sick behaviour, set goals	'Conventional medical system'	1–2 years	Days off work Return to work Chronic disability	Less More Less
Fordyce *et al* 1986[24]	107	Acute back pain (1–10 days)	Family practice, emergency room, orthopaedic outpatients (USA)	Time-contingent analgesics and programmed restoration of activity	Traditional analgesics as required, 'let pain be your guide'	6 weeks, 1 year	6 week assessment Disability Chronic sickness Further health care use	NS NS less less
Lindstrom *et al* 1992a, b[26,27]	103	Sub-acute back pain (8–12 weeks)	Industrial blue collar workers (Sweden)	Graded activity programme, work-place, behavioural principles	Traditional medical care by own physician	1 year	Days off work 1 year sick leave Chronic disability	Less Less Less (NS)
Linton *et al* 1993[28]	198	Acute back or neck pain	Primary care and occupational health (Sweden)	'Early activation', reinforce healthy behaviour, maintain daily activities, training	'Treatment as usual', analgesics, rest and sick leave	1 year	Pain Disability Satisfaction, 1 year sick leave Chronic disability	NS NS Better Less Less
Philips *et al* 1991[25]	117	Acute back pain (first episode < 15 days)	Family practice or emergency room (Canada)	Graded reactivation ± behavioural counselling	'Let pain guide' return to normal (factorial design)	6 months	Pain Rate of recovery (return to activities) Chronic pain	NS Faster Less (NS)

*NS: No significant difference. Outcomes are significant ($P < 0.05$) unless otherwise stated.

potent influences on what patients do about their back pain, on clinical outcomes, and on the development of chronic disability.[36,48] Patients need clear and unambiguous advice. All the available evidence suggests that a simple but fundamental change from the traditional prescription of bed rest to positive advice to stay active could improve clinical outcomes and reduce the personal and social impact of back pain.

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Acknowledgements

This review was prepared for the RCGP guidelines on acute low back pain. We thank Ms A Earle and Dr F Grainger for help with the literature search. ML was funded by the NHS Executive. GF was partly funded by the North Thames Regional Health Authority R&D Directorate.

Address for correspondence

Professor G Waddell, The Glasgow Nuffield Hospital, Glasgow G12 0PJ.