Does 48 hours' bed rest influence the outcome of acute low back pain?

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SUMMARY

Background. *Bed rest is a traditional treatment for back pain, yet only in recent years has the therapeutic benefit of this been questioned.*

Aim. *The aim of this pilot study was to ascertain whether or not 48 hours' bed rest had an effect on the outcome of acute low back pain.*

Method. *The study was conducted as a randomized controlled trial to compare a prescription of 48 hours' strict bed rest with controls; the control subjects were encouraged to remain mobile and to have no daytime rest. Nine general practitioners from practices in the West Midlands recruited patients in the age range 16–60 years who presented with low back pain of less than seven days' duration, with or without pain radiation. The outcome measures assessed were: change in straight leg raise and lumbar flexion after seven days, Oswestry and Roland–Morris disability scores after seven days and 28 days, and time taken from work.*

Results. *Forty two patients were recruited: 20 were allocated to bed rest and 22 as controls. Compared with the bed rest group the control group had statistically better Roland–Morris scores at day seven ($P<0.05$) but not at day 28. At day seven, there were no statistically significant differences between groups in straight leg raise or lumbar flexion measurements although the control group had a better mean lumbar flexion than the bed rest group. The improvement in disability scores at day seven compared with day one was similar for the two groups but more of the control group had fully recovered (defined as scores of one or zero on the Roland–Morris disability scale and five or less on the Oswestry disability scale) by day seven. Remaining mobile did not appear to cause any adverse effects. The number of days lost from work in both groups was equal. A large number of self-remedies and physical therapies were recorded by subjects from both groups.*

Conclusion. *The results of this pilot study did not indicate whether bed rest or remaining mobile was superior for the treatment of acute low back pain; however, the study sample was small. Subjects in the control group possibly fared better as they appeared to have better lumbar flexion at day seven. It appears that 48 hours' bed rest cannot be recommended for the treatment of acute low back pain on the basis of this small study. Large-scale definitive trials are required to detect clinically significant differences.*

Keywords: backache; bed rest; management of disease; outcome.

Introduction

BED rest is a traditional treatment for back pain,[1] yet only three prospective trials have been reported. Deyo and colleagues found no benefit of bed rest for seven days compared with bed rest for two days in terms of disability reduction.[2] Gilbert and colleagues reported that subjects who were confined to bed rest were more restricted in activity after 10 days and took longer to regain their normal level of activities compared with subjects who were given physiotherapy or education about back care.[3] The third study, which had methodological problems, favoured bed rest to daily drill for combat trainees with back pain.[4] A pilot study was undertaken to determine whether or not bed rest for 48 hours had an effect on the outcome of acute low back pain.

Method

In a randomized controlled trial involving nine general practitioners (including M W) from seven practices in the West Midlands, patients in the age range 16–60 years who presented with acute low back pain were, if recruited to the study, either prescribed 48 hours' strict bed rest or were classed as a control; control subjects were encouraged to remain mobile and to have no daytime rest (defined as between 09.00 hours and 21.00 hours). Randomization was achieved by the use of sealed envelopes indicating either 48 hours' bed rest or control. Ethical approval for the study was obtained from the Birmingham Heartland's Hospital ethical committee and participating patients gave signed consent.

Acute pain was classed as that of less than seven days' duration,[5] and subjects had to have been free from back pain for the 28 days before the present episode. Acute low back pain was defined as pain in the area bounded by the lowest palpable ribs superiorly, the posterior axillary lines laterally, and gluteal folds inferiorly; the pain could radiate down one or both legs.[6,7] Conditions that excluded subjects from recruitment were: non-musculoskeletal pain, previous bed rest for more than 24 hours in the present episode, urinary tract infection, viral illness, pyrexia, illiteracy, anticoagulant or steroid therapy, medical contraindications to bed rest, major spinal pathology, inflammatory joint disease and active cancer. Recruitment took place from September 1992 until December 1993. All subjects received ibuprofen or, if this was contraindicated, co-proxamol for analgesia. Compliance was assessed by using treatment diaries, completed by patients, that included hours of bed rest and any self-remedies or physical therapies used.

Demographic and prognostic details of the subjects were recorded on recruitment. The straight leg raise was estimated to the nearest 30 degrees. Lumbar flexion was measured as the distance between the finger tips and the floor with the back fully flexed, to the limit of pain, with the subject's knees together and straight. Pain radiation was estimated in the worst leg on a three point scale (0 = no pain radiation, 1 = radiation above knee, 2 = radiation below knee). Disability was measured using Oswestry and Roland–Morris disability indexes;[6,8-10] these score from zero (no disability) to 100 and 24, respectively, for maximum disability. The first question of the Oswestry disability index measures pain, from score zero (mild pain) to five (maximum pain), and this was used as an additional comparison on recruitment of subjects (day one). Subjects did not receive physiotherapy during the trial, and other treatments, including self-remedies and physical therapies (apart from local application of heat), were discour-

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Submitted: 2 August 1994; accepted: 16 January 1995.

aged. Seven days after recruitment the straight leg raise and lumbar flexion measurements and disability scores were recorded in the practice. A postal disability questionnaire was completed on day 28; this included a recording of Oswestry and Roland–Morris disability scores, days lost from work and any self-remedies or physical therapies used.

To detect a difference of two points on the Roland–Morris disability scale, the sample size was calculated to be 25 to 50 subjects per group (Cronbach's $\alpha = 0.05$, 80% power).[11] Results were analysed by a two sample *t*-test, the Mann Whitney *U* test, the chi square test and Fisher's exact test.

Results

Forty two subjects were randomized: 20 were allocated to the 48 hours' bed rest group and 22 to the control group. Thirty three subjects (79%), 15 from the bed rest group and 18 from the control group, returned for assessment on day seven and 34 subjects (81%), 14 from the bed rest group and 20 from the control group, completed the day 28 questionnaire. Four subjects failed to attend the day seven assessment and failed to complete the day 28 questionnaire.

There were no statistically significant differences between the bed rest and control groups with respect to the subjects' demographic and prognostic details (Table 1) or with respect to mean age, 35.2 years and 41.2 years, respectively, or mean duration of back pain episode, 3.0 days (standard deviation (SD) 1.4 days) and 3.3 days (SD 2.0 days), respectively. Disability scores were greater in the bed rest group on recruitment (Table 2). This was largely caused by some subjects with pain of less than 24 hours' duration being unable to complete the disability questionnaires. However, when those who had pain of less than 24 hours' duration were excluded (four in the bed rest group and five in the control group), the pain scores of the two groups (Oswestry index question one) were similar, as were the disability scores of the two groups.

Table 1. Demographic and prognostic details of subjects with acute low back pain.

Characteristics	No. of subjects in: 48 hours' bed rest group	Control group
Men	13	12
Women	7	10
In full-time employment	12	14
Status[a]		
Married	2	6
Single	17	13
Other	1	2
Previous pain episodes[b]		
0	7	4
1	6	10
>1	7	6
Onset of pain[a]		
Gradual	11	15
Sudden	9	6
Pain radiation score[c]		
0 (none)	11	17
1 (above knee)	7	4
2 (below knee)	1	1
Medication[d]		
Ibuprofen	14	14
Co-proxamol	3	7
Other	1	1

[a]Data missing for one subject in control group. [b]Data missing for two subjects in control group. [c]Data missing for one subject in bed rest group. [d]Data missing for two subjects in bed rest group.

Table 2. Outcome assessments over 28 days for acute low back pain in subjects prescribed 48 hours' bed rest and in controls.

Outcome assessment	Day 1: Bed rest group (*n* = 20)	Day 1: Control group (*n* = 22)	Day 7: Bed rest group (*n* = 15)	Day 7: Control group[a] (*n* = 18)	Day 28: Bed rest group (*n* = 14)	Day 28: Contol group (*n* = 20)
No. of subjects with SLR						
>60°	8	11	10	13	–	–
30°–60°	8	8	4	0	–	–
<30°	4	3	1	1	–	–
Mean (SD) lumbar flexion (cm)	37.5 (14.8)	37.0 (17.5)	27.7 (18.2)[b]	17.4 (13.3)	–	–
Oswestry index						
Mean (SD) score	54.2 (16.8)	44.3* (12.7)	36.0 (19.9)	26.4 (21.1)	22.9 (21.6)	19.2 (15.3)
Mean (SD) score if pain ⩾24 hours[c]	49.8 (16.3)	42.9 (10.2)	–	–	–	–
Mean (SD) pain score if pain ⩾ 24 hours[c]	3.8 (1.4)	3.8 (1.1)	–	–	–	–
Roland–Morris index						
Mean (SD) score	13.9 (5.4)	11.0* (11.0)	9.7 (19.9)	5.3* (5.7)	5.9 (5.6)	3.2 (4.0)
Mean (SD) score if pain ⩾ 24 hours[c]	12.9 (5.6)	10.6 (3.8)	–	–	–	–

n = number of subjects in group. SLR = straight leg raise. SD = standard deviation. [a]Data for SLR and mean lumbar flexion measurements missing for four subjects. [b]Data missing for one subject. [c]Mean score when scores of those subjects with pain of less than 24 hours' duration are excluded (four in the bed rest group and five in the control group). Difference between bed rest and control groups: *$P<0.05$, two sample *t*-test and Mann Whitney *U* test.

Outcome assessments at day seven

At day seven, of the 15 subjects in the bed rest group, 13 (87%) and 11 (73%) reported improvement since day one in their Oswestry and Roland–Morris scores, respectively; 15 of the 18 subjects in the control group (83%) reported an improvement in each score. Deterioration or no change in Oswestry and Roland–Morris scores was reported by two subjects (13%) and four subjects (27%), respectively, in the bed rest group and by three subjects (17%) in each score in the control group. The differences between the groups were not statistically significant. One person in each group deteriorated in all outcome parameters, and three subjects (two in the bed rest group and one control subject) had contradictory improvement in one disability scale and deterioration in another.

The control group had better disability scores than the bed rest group, although the differences were not statistically significant: seven of the 18 subjects (39%) in the control group scored one or zero on the Roland–Morris scale compared with one of the 15 subjects (7%) in the bed rest group; and five subjects (28%) in the control group and no subject in the bed rest group scored five or less on the Oswestry scale.

At day seven, clinical examination failed to show any statistically significant difference between the groups in their straight leg raise or lumbar flexion measurements. The control group had a better mean lumbar flexion than the bed rest group (Table 2) but this was not statistically significant.

Outcome assessments at day 28

At day 28, nine of the 20 subjects (45%) in the control group scored one or zero on the Roland–Morris scale compared with three of the 14 subjects (21%) in the bed rest group; this difference was not significant.

Of the 14 subjects in the bed rest group, 11 (79%) and 12 (86%) reported an improvement at day 28 since day one in their Oswestry and Roland–Morris scores, respectively; 19 of the 20 subjects in the control group (95%) reported an improvement in each score. The differences between the groups were not statistically significant. However, from day seven to day 28, the bed rest group showed greater improvements in disability scores than the control group, and this was statistically significant ($P<0.05$) for the Roland–Morris scale. Deterioration, or no change, in disability from day one to day 28 appeared to be greater in the bed rest group (three subjects (21%) and two subjects (14%) reported deterioration or no change in Oswestry and Roland–Morris scores, respectively) compared with the control group (one subject (5%) reported this in each score); however, differences between the groups were not statistically significant. Remaining mobile did not appear to cause any adverse effects in the subjects in the control group.

Time off work

Twenty six of the 42 subjects (62%) were in full-time employment and, of these, 22 provided details of the number of days lost from work over the 28-day study period because of acute low back pain. Of the 10 respondents from the bed rest group, time off work ranged from three to 28 days (mean 10 days (SD 8.5 days)) and of the 12 respondents from the control group, time off work ranged from zero to 28 days (mean 11 days (SD 10 days)); the difference between the groups was not statistically significant. Three subjects in the control group missed no work; this was impossible for those prescribed bed rest.

Self-remedies and physical therapies

Self-remedies and physical therapies reported by the 42 subjects were: local application of heat (10 subjects in the bed rest group and five in the control group); exercises (seven and four subjects, respectively); massage (five and three subjects, respectively); rubefacients (four and four subjects, respectively); chiropractic (one and one subject, respectively); and physiotherapy (two and no subjects, respectively). No subject reported using acupuncture or homoeopathy. Although there were more recordings of treatments by subjects in the bed rest group than in the control group (29 and 17, respectively), the difference was not significant.

Daytime rest

Thirty two of the 42 treatment diaries (76%) were returned. During the first 48 hours, subjects who were prescribed 48 hours' bed rest spent twice as many hours resting compared with controls, 12.6 daytime hours (SD 6.0 hours) and 6.1 daytime hours (SD 2.6 hours), respectively ($P<0.05$, t-test and Mann Whitney U test). From day three to day five, there was no statistically significant difference between the groups in the time spent resting (12.5 daytime hours (SD 6.2 hours) and 9.3 daytime hours (SD 4.2 hours), respectively.

Discussion

Three studies have previously been published of controlled trials of bed rest for acute back pain.[2-4] Two showed no difference in outcome between bed rest and control[2,3] whereas the other was positive but methodologically unsound.[4] The sample in the present pilot study was very small, yet it was comparable in size to many back pain studies.[12,13] However, this pilot study does not add support to the therapeutic use of bed rest. Compared with remaining mobile, rest seemed to be associated with increased stiffness and less lumbar flexion in the first few days of recovery, as was also found by Gilbert and colleagues.[3]

In this pilot study, a larger proportion of subjects in the control group had scores of one or zero on the Roland–Morris disability scale and five or less on the Oswestry disability scale (were fully recovered) by seven days than in the bed rest group and there was a smaller decrease in disability scores in the former group from day seven to day 28. The bed rest group showed greater improvement after day seven, that is, subjects in this group continued to improve from day seven to day 28 to reach similar disability scores to those of subjects in the control group at day 28. It would be logical to assume that 48 hours' bed rest would result in a greater reduction in disability in the first few days, but in this study the control group showed an earlier recovery than the bed rest group.

With respect to the outcomes of disability and days lost from work, both groups had similar results, although work is not feasible for those prescribed bed rest for 48 hours. An early return to work has been advocated even if there is residual back pain.[14] The high number of self-remedies and physical therapies used by subjects in both groups would suggest that positive therapies are possibly more acceptable than rest and that remaining mobile is possibly a more acceptable option than rest if neither treatment approach proves superior.[15]

The disability scores used in this study may be inappropriate when assessing pain of less than 24 hours' duration as proven by the difficulty encountered with administering the disability questionnaires in this pilot study. This has not previously been reported as a problem. Reliance on the history of the condition, clinical examination and pain scores may be better to assess the inception cohort with acute low back pain.

No advantage of 48 hours' bed rest over no bed rest for acute low back pain was shown in this study and no harm was demonstrated by remaining mobile; subjects in the control group possibly fared better, as they appeared to have better lumbar flexion at day seven. It appears that bed rest cannot be recommended for acute low back pain but large-scale definitive trials are required to demonstrate clinically significant differences and thus whether remaining mobile is to be preferred over bed rest.

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Acknowledgements

This project was funded by a Royal College of General Practitioners scientifc foundation research grant. I thank the eight general practitioners who recruited patients, Linda Thomas and Kay Chambers for their hard work, and Dr John Wilmot, Dr David Wall, Dr Kate Thomas and Tim Marshal for their advice and encouragement.

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