The treatment of acute low back pain: bed rest, exercises, or ordinary activity?

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Bed rest, back extension exercises and ordinary activities for the treatment of low back pain.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Employees of the city of Helsinki, Finland, who presented with low back pain as their main symptom.

Setting
Occupational health care centres. The economic study was conducted in Finland.

Dates to which data relate
Patients were enrolled into the study during the period January 1992-April 1993, and were followed up for 12 weeks. 1992 prices were used.

Source of effectiveness data
Derived from a single study.

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample as that used in the effectiveness study.

Study sample
186 subjects were included: employees working in public transport or the electricity supply services were excluded as were patients with a sciatic syndrome, pregnant patients, those with a history of cancer, a fracture of the lumbar spine, or urinary tract disease. Two days of bed rest was recommended for 67 patients, exercise for 52 patients and normal activity as tolerated for 67 patients. The three groups were similar with regard to most of the baseline characteristics. The control group contained a few more people engaged in heavy physical work, the bed rest group had more patients with pain radiating below the knee, and the exercise group had more patients with prolonged pain during the previous 12 months. The calculation of power showed a need for 64 subjects in each treatment group in order to achieve a statistical power of 0.80 with an alpha of 0.05.
Study design
The study was a randomised controlled trial. A simple randomisation was performed before recruitment with random number tables, and written instructions for the three treatments were sealed in envelopes. The study took place in more than one occupational health centre but it is not clear exactly how many centres were involved. The patients visited the physiotherapists and completed follow-up questionnaires after 3 and 12 weeks. At 3 weeks follow-up information was obtained for 165 of the subjects (89%); 5 subjects were absent from the bed-rest group, 10 from the exercise group and 6 from the control group. After 12 weeks, information was obtained on 162 subjects (87%); 8 subjects were missing from the bed-rest group, 11 from the exercise group and 5 from the control group. Outcome assessments were based on patient questionnaire data, measurements by physiotherapists and sick-leave data from medical records. All measurements were made without the physiotherapists knowledge of the treatment.

Analysis of effectiveness
The analysis of the clinical study was based on treatment completers only. Functional status was assessed by the Oswestry low-back-pain disability questionnaire and a health-related measure of quality of life, on which 9 of the 15 items were relevant to low back pain. The duration of absence from work was assessed from medical records. Straight leg raising and lumbar flexion were measured by a study physiotherapist. In addition number of sick days and duration of pain were evaluated. The three groups were similar with regard to most of the baseline characteristics. The control group contained a few more people engaged in heavy physical work, the bed-rest group had more patients with pain radiating below the knee, and the exercise group had more patients with prolonged pain during the previous 12 months. Two patients in the exercise group had undergone previous back surgery.

Effectiveness results
At three weeks, and after adjustment for baseline measures, the control group had statistically significant advantages over the bed-rest group in terms of the duration of absence from work due to sickness and the ability to work. As compared with the patients in the exercise group, the control patients recovered significantly better in terms of the number of sick days, the duration of pain, and scores on the Oswestry back-disability index. The median number of sick days was 5 in both the bed rest group and the exercise group, and four in the control group. At twelve weeks, after adjustment for baseline values, the patients assigned to bed rest recovered significantly more slowly than the controls in terms of the number of sick days, the intensity of pain, the ability to work, lumbar flexion and the Oswestry back-disability index. Recovery was slower in the exercise group than in the control group in terms of the number of sick days and capacity for lumbar flexion. The median duration of absence from work was six days in the bed rest group, five days in the exercise group and four days in the control group. No one was still absent from work at 12 weeks of follow-up.

Clinical conclusions
As little as two days of bed rest may lead to a slower recovery than the avoidance of bed rest, as well as to longer sick leaves. Light exercise resulted in a slower recovery after three weeks. Avoiding bed rest and maintaining ordinary activity as tolerated lead to the most rapid recovery.

Measure of benefits used in the economic analysis
Disease-specific Oswestry back-disability index scores were obtained from the patients via a 12-week follow-up questionnaire. In addition the number of sick days, duration of pain and capacity for lumbar flexion were also obtained.

Direct costs
The costs of medicines were estimated from the data entered on the questionnaires and from the medical records. The costs of public health services (visits to a physician, a nurse, or a physiotherapist) were calculated from the unit costs of these services in the City of Helsinki Occupational Health Care Centres. The costs of similar services provided privately were recorded on the basis of the patients' own expenditures. Home help was defined to include help from the patients' spouses and children or their families, relatives and friends. The use of home help was gathered from the patient-completed questionnaires. Two alternative calculations were applied. First, half the current wage of a municipal
home helper was used, unless the helper had taken time off from work, in which case the total wage was used. In the second calculation, the total wage was used for all the help.

**Currency**
US dollars ($). Derived from Finnish currency at the 1992 exchange rate ($1=4.48 Finnish marks)

**Cost results**
The total cost of health care and home help for bed rest patients was $191(half wages) or $234(total wage), for exercise patients $282(half wages) or $397(total wage) and for control patients $150 (half wage) or $168 (total wage).

**Synthesis of costs and benefits**
Benefits and costs were not combined as the control group was the dominant strategy.

**Authors' conclusions**
If a cost-benefit analysis based on the value of human capital were used, with a monetary value placed on lost production due to absence from work, the control treatment would definitely emerge as the most economical. Widespread use of this approach in clinical practice would result in substantial monetary savings.

**CRD Commentary**
A seemingly large number of potential patients were excluded from the study (including for an unclear reason those working in the public transport and electricity supply industries). The power calculation suggested that each group would require 64 patients. However, the exercise group had only 52 patients at the beginning of the study and none of the groups had sufficient numbers at the 12 week follow-up stage. Consequently, the study was unable to show any statistically significant results. As the authors noted it was difficult to assess compliance via patient completed questionnaires and it may be that compliance within the three treatment arms was less than that stated.

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