Title **Does Early Magnetic Resonance Imaging Influence Management or Improve Outcome in Patients Referred to Secondary Care with Low Back Pain? A Pragmatic Randomised Controlled Trial**

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Reference Health Technol Assess 2004;8(17). May 2004. www.ncchta.org/execsumm/summ817.htm

Aim

To establish whether the early use of sophisticated imaging techniques, eg, magnetic resonance imaging (MRI) or computed tomography (CT) influences the clinical management and outcome of patients with low back pain (LBP) and whether it is cost effective.

Conclusions and results

Participants in both groups reported improvements in health status at 8 and 24 months, with slightly better scores in the 'early imaging' group. The mean difference for the ALBP score was 3.05 points at 8 months (p=0.005) and 3.62 points at 24 months (p=0.002). The 'early imaging' group also had significantly greater improvement in many subscales of the SF-36 at 8 months, but only for the Bodily Pain subscale at 24 months. For the EQ-5D, the difference was only significant at 24 months. Other than the share of participants receiving imaging (90% versus 30%) there were few differences in management throughout the 24-month followup. Total outpatient consultations in the two groups were similar, but more people in the 'early imaging' group had return outpatient appointments during the 8-month followup (p<0.001). At 24 months the number of outpatient appointments did not differ. Clinicians' diagnostic confidence, between trial entry and followup, increased for both groups with a significantly greater increase in the 'early imaging' group (p=0.01). Therapeutic confidence did not differ, and increased in both groups with time. The cost of imaging was the main determinant of the difference in total costs between groups, and it was estimated that 'early imaging' could provide an additional 0.07 QALYs, on average, over the 24-month followup. The mean incremental cost per QALY of 'early imaging' was £800. The results were sensitive to the imaging costs and confidence intervals surrounding estimates of average costs and QALYs.

Recommendations

The early use of sophisticated imaging does not appear to affect management overall. Although outcome scores improved slightly, this is of questionable clinical significance. However, imaging was associated with an increase in clinician's diagnostic confidence, particularly for nonspecialists. Decisions on the use of sophisticated imaging in this context will depend on judgments about the value of the observed differences in outcome and whether these justify the extra costs.

Methods

The study design was a pragmatic multicenter randomized controlled trial using a standard two-parallel group approach incorporating economic evaluation. A controlled 'before and after' approach was used in a subgroup to assess the impact of 'early imaging' on clinicians' diagnostic and therapeutic confidence. Patients who consented to participate were randomly allocated to 'early imaging' or 'delayed, selective imaging'. The referring clinician chose the imaging modality and patient management plan.

Further research/reviews required

Determine if more rapid referral to sophisticated imaging and secondary care for certain categories of LBP is important. Investigate the effect of MRI on patient expectation and reassurance.

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