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Cost-effectiveness of Lumbar Total Disc Replacement versus Lumbar Fusion

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Objectives: Chronic low back pain caused by degenerative disc disease is one of the most common causes for doctor visits in western industrial countries and presents an immense economic burden both to the individual and to society. In many cases, surgery can be a treatment option. For some indications, lumbar disc arthroplasty may be an innovative alternative to the current gold-standard (lumbar fusion) and recent clinical studies have shown at least its non-inferiority for short- and midterm follow-up. The aim of this investigation was to analyse cost-effectiveness of „lumbar disc arthroplasty“ versus „lumbar fusion“ from a health care system’s perspective in Austria.

Methods: A decision model including treatment paths and associated direct costs (surgery, inpatient stays, outpatient visits, GP and orthopaedic consultations, x-ray, medication, rehabilitation and physiotherapy) over a 18-months time horizon was developed. Main outcomes were clinical success (measured by Oswestry-Disability-Index (ODI) and SF-36 at 1 year follow-up) and costs in Euros (€). Clinical input data was derived from a recently performed matched-cohort-study and a meta-analysis of trials comparing the two treatment options. Costs were derived from standard Austrian price lists and from hospital’s cost unit accounting.

Results: Disc arthroplasty showed comparable outcome-scores at 1.5 year-follow up, while at the same time caused lower costs than lumbar fusion: Costs per improved ODI-point were 954€ in the fusion group and €645 in patients treated with lumbar disc arthroplasty. Costs for one gained SF36-point were €1645 after fusion and €954 after disc arthroplasty.

Conclusions: For a period of 1.5 years after surgery, this study suggests that lumbar disc arthroplasty is a cost-effective treatment compared with lumbar fusion from a health care system’s perspective in Austria. Further studies, including longer follow-up and indirect-costs, are necessary for the assessment of cost-effectiveness from the societal perspective.