

Low back pain in relation to lumbar spine abnormalities as identified by magnetic resonance imaging

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ABSTRACT

This PhD dissertation is based upon the study “The Backs of Funen – what is the source of their pain?”, which was carried out at the Back Research Center, Ringe, Denmark. The basis of this thesis is the lack of knowledge regarding the clinical relevance of MRI findings in relation to low back pain. The aim of the study was to clarify the incidence of MRI findings and their associations to low back pain in 13- and 40-year old individuals from the general population.

The study involved 412 40-year-olds and 439 13-year-old children from Funen. All participants underwent an MR scan. Low back pain was determined with questionnaires/interviews.

Low back pain “in the last month” was reported by 42% of the adults and 22% of the children, “pain during the previous year” by 69% of the adults and 41% of the children. Twenty eight per cent of the adults and 8% of the children had sought care for their symptoms.

Considerable degenerative discal changes were seen in approximately 50% of the adults and 20% of the children. Disc herniations were found in 25% and 3% of children and adults, respectively, while endplate changes were seen in 30% of the adults and 6% of the children. Modic type changes were found in 22% of the adults and spondylolisthesis in 3% in both age groups.

In adults, the MRI findings with the strongest associations to low back pain were Modic changes, spondylolisthesis, and severe fat infiltration in the deep spinal muscles. Degenerative discal changes were moderately associated with LBP. As regards the children, degenerative findings in the discs and endplate irregularities were most strongly associated with low back pain. Disc herniations and spondylolisthesis were strongly associated with seeking care.

Based upon the findings of our study, the greatest clinical relevance of MRI findings in relation to low back pain in adults appears to be Modic type changes. Endplate changes, degeneration of the intervertebral discs, and disc herniations are relevant in children, whereas spondylolisthesis is a relevant finding in both children and adults. Definitive conclusions regarding the clinical relevance of MRI findings will require follow-up studies.