

Jarvik JJ, Hollingworth W, et al. The Longitudinal Assessment of Imaging and Disability of the Back (LAIDBack) Study. Baseline Data. Spine 2001;26:1156-1166.

Design: Prospective cohort study

Population/sample size/setting:

- 148 patients (83% male, 17% female, mean age 54) randomly selected from several non-musculoskeletal clinics at the VA health care system in Puget Sound, WA
- Any patient attending a VA clinic was eligible; the group was stratified into two equal age groups: 35-52 and 53-70
- Exclusion criteria were designed to create a cohort without back pain at baseline
 - o Low back pain more than mildly bothersome in the Roland-Morris scale in the past 4 months
 - o Sciatica in the past 4 months
 - o Previous back surgery
 - o Previous chymopapain injections
 - o Previous discography
 - o History of acute trauma to the low back
 - o Fibromyalgia or peripheral neuropathy
 - o Serious comorbid condition with expected survival less than 3 years
 - o Dementia or other decreased ability to communicate
 - o Contraindications to MRI such as claustrophobia or pacemakers

Main outcome measures:

- Primary measures of symptoms were the pain frequency and pain bothersomeness questionnaires
 - o These ask the patient to rate frequency and bothersomeness of symptoms on a scale from 1 to 6
 - o Four domains are recorded: (1) low back or buttock pain, (2) sciatic leg pain, (3) numbness or tingling of leg, foot, or groin, (4) weakness in leg or foot
 - o The responses are added to form an index with range from 4 to 24
- The Roland Morris score (0-23) was used to assess functional impact of pain
- Imaging was done with a 1.5 T MRI system to assess the spine at 5 lumbar disc levels
- Interpretation was done by one of two radiology faculty who were aware that the patients were not symptomatic
- Imaging findings were classified as disc desiccation (mild, moderate, severe), annular tear, loss of disc height, disc morphology (bulge, protrusion, extrusion), size of morphology (small or large), herniated disc location, endplate changes, nerve root compromise, facet arthropathy, and stenosis
- Some evidence of disc degeneration was seen in 134 subjects (91%) at baseline
 - o Moderate to severe desiccation was the most common finding (123 of 148); a majority (95 of 148) had one or more bulging discs or loss of disc height (83 of 148)
 - Loss of disc height was reported in 56% of the study population
 - o More extreme disc changes were not uncommon; disc protrusion was present in 48 subjects (32%)

- MRI changes were seen in structures other than the discs: annular tears in 38%, endplate changes in 26%, and facet degeneration in 18%
- Most patients (n=106) were considered “pristine,” with perfect scores on symptoms and function and never a history of any low back pain; the percentages of MRI changes were not different in these patients
- The only imaging finding associated with back pain was disc extrusion; this was 5 times more common in patients who had had some back pain in the past than in patients who never had back pain
- Age had an effect on the frequency of MRI changes; 100 % of those over 65 had disc degeneration; 77% of those under 45 had disc degeneration
- A history of smoking was associated with more frequent endplate changes (odd ratio of 3.57)

Authors’ conclusions:

- MRI findings fall into five basic categories
 - o Common findings not associated with age or prior LBP (annular tears, disc protrusion)
 - o Common findings which increase with age but not related to prior LBP (disc bulges, facet joint degeneration, endplate changes, and mild spondylolisthesis)
 - o Common findings associated with both age and with prior back pain (disc desiccation, loss of disc height)
 - o Uncommon findings associated with occurrence of prior LBP but not associated with age (disc extrusion and nerve root compromise)
 - o Moderate stenosis, which is related to prior LBP, mild current LBP, and aging
- Findings associated with prior LBP (disc extrusion, nerve root compromise) are properly called “abnormalities”
- Findings not associated with LBP but associated with aging (disc bulges, desiccation, loss of disc height) are so common in asymptomatic patients that it may be misleading to call them abnormalities
- The VA population may be unusual because of high rates of disability and ill health; it may not be typical of the general population
 - o However, the SF-12 and mental health scores did resemble those of the general population, suggesting that this population may be similar in overall health
 - o The study sample was randomly selected from a well-defined population
 - o Asymptomatic status was rigorously determined
 - o The radiologists were aware of the asymptomatic population; this may have led to a conservative reporting of departures of MRI from an ideal of normal
- Morphology is not sufficient to make a diagnosis of back pain

Comments:

- As the authors note, there are two factors which could have opposite, and possibly offsetting effects on the estimation of prevalence in the general population: a high rate of disability in the VA population (potential to increase prevalence of disc abnormality), and unblinded reading of the MRI (potential to decrease the prevalence of MRI abnormality)

- The fact that most of the study population had no history of back pain or functional limitation (the “pristine” participants in the study) is not likely to create a bias inflating the prevalence of disc and facet changes
- The criteria for MRI changes was sufficiently clear to enable an acceptable interrater reliability between the two radiologists
- Although there were data to support an association between disc extrusion and back pain, the numbers involved are too small to support a clear statement of the clinical correlations between extrusion and a particular pattern of symptoms

Assessment: High quality study supporting good evidence that there is a high prevalence of disc bulges, disc protrusion, disc desiccation, loss of disc height, endplate changes, annular tears, and facet arthropathy in patients who have no back pain, current or recent; these morphologic changes are not enough to make a diagnosis of any lumbar spinal condition