Sinikallio S, Aalto T, et al. Depressive Burden in the Preoperative and Early Recovery Phase Predicts Poorer Surgery Outcome Among Lumbar Spinal Stenosis Patients. A One-Year Prospective Follow-up Study. Spine 2009;34(23):2573-2578.

Reviewed, no change to conclusions, November 2016

Design: Observational cohort study

Population/sample size/setting:

- 100 patients (42 men, 58 women, mean age 61) treated for lumbar spinal stenosis (LSS) in a university rehabilitation department in Finland
- Inclusion criteria were severe back/buttock and/r lower extremity pain with imaging evidence of compression of the cauda equina or exiting nerve roots by degenerative changes, and the surgeon's opinion that the patient had degenerative LSS requiring surgery
- Exclusion criteria were emergency or urgent spinal surgery, cognitive impairment precluding completion of questionnaires, and metallic particles precluding MRI investigation

Main outcome measures:

- At baseline, preoperative questionnaires were collected and were collected again at 3 months and one year
- The questionnaires included self-reported walking capacity, a modified pain drawing, overall back and leg pain intensity on a 100 point VAS, the Finnish version of the Oswestry Disability Index (ODI), a symptom severity scale (pain, numbness, weakness, balance, walking distance, ability to go shopping), and a Finnish version of the Beck Depression Inventory (BDI)
- 18% of the LSS patients were depressed at 1 year postop, using a cutoff point of 14/15 on the BDI
- "Poor surgical outcomes" appear to have been defined as being above the median score at 1 year on ODI, VAS, symptom severity scale, and walking capacity
- Three separate logistic regression models were used to predict each of the poor outcomes; each model entered depression in a slightly different way
- Each model had these covariates in addition to depression: age, gender, marital status, somatic comorbidity, ODI, VAS, and symptom severity scale
- The first model entered depression as the baseline score on the BDI; this was associated with worse ODI, symptom severity scale, and walking capacity at 1 year, but not with worse pain on VAS
- The second model entered depression as the "depressive burden," defined as the sum of the BDI at baseline, 3 months postop, and 6 months postop; it was associated with worse ODI, symptom severity scale, and walking capacity, but not with pain on VAS
- The third model entered depression as a dichotomous variable, with a value of "yes" if the depressive burden (from model 2) was above the median, and

"no" otherwise; it was also associated with the same three poor outcomes as the other two models, and also with pain VAS

- In the third model, a depression burden above the median had an odds ratio of 17.31 for ODI above the median (95% confidence interval, 4.03 to 74.37); for symptom severity scale, the odds ratio was 6.13 (1.83 to 20.57), and for walking capacity, the odds ratio was 12.13 (3.26 to 45.11); for pain the OR was 3.84 (1.22 to 12.04)
- Although baseline pain VAS was associated with pain at 1 year, there was no statistically significant association between the ODI at baseline and 1 year, and no association between symptom severity scale at baseline and 1 year
- For all variables in the logistic model, ODI at 1 year was associated only with depression scores; symptom severity scale at 1 year was associated with baseline VAS and with depression, and walking capacity at 1 year was associated only with depression scores

Authors' conclusions:

- Cumulative sub-threshold depression, detected by adding together the BDI scores at baseline, 3 months, and 6 months, allows examination of the significance of depressive symptoms among all patients, and not only those meeting diagnostic criteria for major depression
- Depression is a factor that has to be considered among LSS patients; a treatment model should include thorough preoperative and postop clinical examinations which include recognition of depression

Comments:

- The text does not make it clear that the "poor outcomes" are defined as scores above the median on the 4 outcomes, but this must be inferred by the reader (confirmed through e-mail with the lead author)
- Using the median score allows for greater efficiency in a logistic model, since half of the patients (about 48 in this study) will have the outcome being measured; this allows for more covariates being entered into the model
- There was not enough data to allow for inferences to be made regarding the trend of depressive scores across time (increasing, decreasing, staying the same), even though the authors did report that continuous depressive symptoms showed poorer postoperative improvement)
- The odds ratio for pain VAS was lower than the odds ratios for the functionally-oriented outcomes, suggesting that depression may inhibit functional recovery more than it inhibits reduction in pain

Assessment: Adequate for evidence that depression at the time of operation and in the early postoperative period predicts poorer functional recovery from LSS surgery