THE EFFECT OF BONE MINERAL DENSITY ON FUNCTIONAL OUTCOMES AND FUSION STATUS IN PATIENTS UNDERWENT INSTRUMENTED ANTERIOR CERVICAL DISCECTOMY AND FUSION

S. ERKAN, Z. SEN, C. OKTA, T. OZALP, H. YERCAN, G. OKCU

Celal Bayar University, Faculty of Medicine, Dept. of Orthopaedics and Traumatology, Manisa Turkey
The number of complex spinal surgeries has increased significantly in the elderly population.

Spine surgeons often treat osteoporotic patients who are associated with higher rates of instrumentation failure.

Establishing a successful fusion requires an appropriate substrate for bone formation and local bone remodeling.

Difference of the cage subsidence rate was reported between the moderate and severe osteoporotic patients.


OBJECTIVE

To investigate the influence of bone mineral density (BMD) on functional outcomes and on fusion status in patients who underwent instrumented anterior cervical discectomy and fusion (ACDF).
MATERIALS AND METHODS

- 32 patients (20 females, 12 males; mean age 52±8)
- Single or two-level instrumented ACDF
- The mean follow-up period 25±6 months
- BMD was measured by the dual energy x-ray absorptiometry (DEXA) method.
- Coronal and sagittal computerized tomography with 1 mm thickness
MATERIALS AND METHODS

- Functional outcomes were analyzed by using Neck Disability Index (NDI), Short-Form 36 (SF-36) and Visual Analogue Scale (VAS).

- The relationship between BMD, functional outcome and fusion status was evaluated statistically.
RESULTS

- The mean BMD $0.926 \pm 0.257$ g/cm$^2$
- Fusion in 25 patients (78.1%)
- Nonunion in 7 patients (21.9%)
- The mean BMD of the patients with fusion $0.973 \pm 0.168$ g/cm$^2$ and with nonunion $0.665 \pm 0.134$ g/cm$^2$, respectively (p=0.038)
RESULTS

- The mean preoperative NDI, SF-36, and VAS score of the patients was 44.1±2.8, 46.3±10.8, and 8.4±2.5, respectively. The mean postoperative NDI, SF-36, and VAS score of the patients was 12.7±4.1, 74.5±12.5, and 1.2±0.6, respectively in the fusion group and 17.9±2.1, 63.6±3.7, and 2.3±1.1, respectively in the nonunion group.

- All patients significantly improved functionally (p<0.05), however, the mean functional improvement was significantly higher in the fusion group (p=0.027).

- No significant relation was found between the BMD and functional improvement in both groups (p=0.182 and p=0.217).
CONCLUSION

- BMD affects fusion status in patients undergoing instrumented anterior cervical discectomy and fusion.

- In the presence of low BMD values, surgeons should make preoperative planning meticulously when performing instrumented ACDF.
None of the authors in this study have any conflict of interest