The effect of general bone mineral density and age on dental implant placement

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Objective: To investigate the potential impact of age and general bone mineral density (BMD) on the feasibility of dental implant placement in postmenopausal women with edentulous jaws.

Materials and methods: The study enrolled a total of 128 postmenopausal females with edentulous jaws, aged 52 to 91 years (mean age 70.39 ± 8.85) who sought dental implant treatment. DXA (Lunar DXA DPX-NT) was used to measure BMD in the lumbar spine and hips and the lowest T-score from both readings was considered. Cone beam computed tomography (CBCT) was conducted using the i-CAT system (Kavo eXam Vision) and analysed with OnDemand3D software. Multiple cross-sectional images were obtained from CBCT: maxilla (central incisors, canines, first premolars, first molars) and mandible (lateral incisors, first premolars, first molars). Bone height and width were determined on these images to determine the ability to place dental implants. To detect differences between groups One-way ANOVA and Pearson's chi-squared test were used.

Results: Based on the DXA results, the patients were divided into 3 groups: normal BMD (n=42, mean age 69.45 ± 9.13), osteopenia (n=56, mean age 70.09 ± 8.96), and osteoporosis (n=30, mean age 72.27 ± 8.27) (p=0.527). No statistically significant differences were observed between the different BMD groups regarding the possibility of implant placement and general bone mineral density and across all areas of both jaws ($p > 0.05$). Women with osteoporosis were able to place fewer implants on average than women with normal BMD, but the difference between groups was not statistically significant ($p > 0.05$). Also, female age was not statistically significantly associated with the possibility of dental implant placement, except for the maxillary left central incisor region ($p = 0.007$).

Conclusions: The general BMD and age does not affect implant placement feasibility in postmenopausal women with edentulous jaws.