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Diagnosing osteoporosis by using dental panoramic radiographs: The OSTEODENT project

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Objectives

Measurement of cortical thickness and subjective assessment of cortical porosity on panoramic radiographs are methods previously reported for diagnosing osteoporosis. The aims of this study were to determine the relative efficacy of the mandibular cortical index and cortical width in detecting osteoporosis, both alone and in combination, and to determine the optimal cortical width threshold for referral for additional osteoporosis investigation.

Study design

Six hundred seventy-one postmenopausal women 45 to 70 years of age were recruited for this study. They received dual energy x-ray absorptiometry (DXA) scans of the left hip and lumbar spine (L1 to L4), and dental panoramic radiographic examinations of the teeth and jaws. Three observers separately assessed the mandibular cortical width and porosity in the mental foramen region of the mandible. Cortical width was corrected for magnification errors. Chi-squared automatic interaction detection analysis (CHAID) software was used (SPSS AnswerTree, version 3.1, SPSS Inc., Chicago, IL).

Results

Chi-squared automatic interaction detection analysis showed that the cortical porosity was a poorer predictor of osteoporosis than mandibular cortical width. For the 3 observers, a mandibular cortical width of <3 mm provided diagnostic odds ratios of 6.51, 6.09, and 8.04. The test is therefore only recommended in triage screening of individuals by using radiographs made for purposes other than osteoporosis.

Conclusion

When evaluating panoramic radiographs, only those patients with the thinnest mandibular cortices (i.e., <3 mm) should be referred for further osteoporosis investigation.

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