Summary of: The role of the dental surgeon in detecting osteoporosis: the OSTEODENT study

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FULL PAPER DETAILS

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Objective To determine if thinning (<3 mm width) of the lower cortical border of the mandible on dental panoramic radiographs, as well as other clinical risk factors, may provide a useful diagnostic test for osteoporosis in young postmenopausal women. **Design** Six hundred and fifty-two subjects (age range 45–70 years) were involved in this multi-centre, cross-sectional study. **Setting** Patients were recruited from centres in Leuven (Belgium), Athens (Greece), Manchester (UK), and Malmö (Sweden). **Subjects and methods** The subject's age, body weight, whether the patient took hormone replacement therapy or had a history of low trauma fracture were used to form a clinical osteoporosis risk assessment (the OSteoporosis Index of RiSk or OSIRIS index). Each patient also received a dental panoramic radiographic examination. **Results** One hundred and forty subjects had osteoporosis involving at least one of the measurement sites (lumbar spine, femoral neck or total hip). Those with osteoporosis tended to have a low OSIRIS score and a thinned cortical mandibular border. The area under the ROC curve for using both cortical width and OSIRIS to predict osteoporosis was 0.90 (95% CI = 0.87 to 0.92). There was a significant improvement in the diagnostic ability of the combined OSIRIS and cortical width test over both tests applied separately ($p < 0.001$). The cost effectiveness of the cortical width and OSIRIS model was improved by using a high specificity threshold rather than high sensitivity. However, this analysis ignores the costs associated with missed cases of osteoporosis. **Conclusion** Dentists have a role to play in the detection and referral of patients at high risk of osteoporosis.

EDITOR'S SUMMARY

This interesting study suggests an addition to the areas of general health advice and screening that are increasingly becoming part of the dental professional's role. Tobacco cessation is one well-known example of the health and lifestyle advice that dentists are encouraged to provide to their patients and it is acknowledged that dentists are well placed to give this kind of information and help to the individuals that they treat. The authors of this paper suggest that dentists may also be in a position to detect patients at early high risk of osteoporosis, using dental panoramic radiographs.

The study's authors combined a risk assessment using the osteoporosis index of risk (OSIRIS) with measurement of the cortical mandibular width on a

dental panoramic radiograph. Computer software was developed to automatically locate and measure the mandibular cortex on the radiographs and then prompt the dentist to provide clinical information that, combined with the radiographic data, enables the programme to provide a recommendation as to whether the patient should be referred for further investigation into possible osteoporosis. The results show that when the results of the OSIRIS assessment and the radiographic assessment were combined, there was a significant improvement in the diagnostic ability when compared to each test individually.

While the study is interesting and suggests a role for dental practitioners in the diagnosis and referral of patients at high risk of osteoporosis, this study is prelimi-

nary in nature and further research is required in order to assess whether this method would be reliable and cost effective enough to put into clinical practice. The authors detail the limitations of the study clearly in their discussion and it is plain that there is much further work to be done. This study has made an important start, however. It remains to be seen whether assessing patients for risk of osteoporosis will become just another routine part of dental practice in the future.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 204 issue 10.

Rowena Milan,
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IN BRIEF

- Women at high risk of osteoporosis can be identified by dentists using information from panoramic radiographs supplemented by a few clinical questions.
- Dentists may contribute to a woman's general health by facilitating onward referral to medical colleagues.
- The software that carries out the radiographic assessment requires minimal dentist input to work optimally.

COMMENT

This is an interesting paper which effectively demonstrates how by combining a computer software program with digitally produced panoramic dental radiographs and clinical risk indices data (OSIRIS), patients can be detected who are at early, high risk of developing osteoporosis. This very common condition can lead to the development of fractures of the hip and vertebrae with a very high morbidity and mortality as a consequence. Early detection and treatment could prevent this occurrence. This study looked at women in the age range of 45 to 70 years who undoubtedly have the highest incidence of osteoporosis.

However, men are not immune from this condition and a recent study of 2,000 men aged over 50 presenting with fractures had a prevalence of osteoporosis ranging from 17.5% with ankle fractures to 57.8% with hip fractures.

I agree with the authors that further clinical trials of this technique should be encouraged but should also include men over 50.

As this could prove to be an important health preventive measure, Primary

Care Trusts should be persuaded to take it up in conjunction with dental practices throughout the country.

**Richard Lloyd, Consultant Oral & Maxillofacial Surgeon,
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1. Sharma S, Fraser M, Lovell F, Reece A, McLellon A R. Characteristics of males over 50 who present with a fracture. *J Bone Joint Surg* 2008; 90-B: 72-77.

AUTHOR QUESTIONS AND ANSWERS

1. Why did you undertake this research?

Dentists examine a large proportion of the population on a regular basis, and are therefore ideally placed to perform a health screening role. Increasingly, the role of the dentist is extending into areas of general health care, such as tobacco cessation, moderation in alcohol consumption and other lifestyle advice.

Each year, dentists make an enormous number of radiographic examinations. In particular, dental panoramic radiographs can provide valuable information about the width of the mandibular cortical border, which is thinned in osteoporosis. We therefore developed software which will locate the mandibular cortex on radiographs with the minimum of user interaction, and measure its width.

2. What would you like to do next in this area to follow on from this work?

The patients used in our study have all been from a hospital-based population. At this stage it is not clear whether our recommended referral path from dentists would be an effective method of preventing osteoporotic fractures in primary care. Such a study would require the testing of thousands of participants, treating those at high risk and then following them up for a number of years to determine if fractures were prevented.

Further studies to predict osteoporotic fracture are necessary to better quantify the osteoporotic risk associated with some medical conditions. Ankylosing spondylitis and severe rheumatoid arthritis, as well as additional clinical risk factors, have a role in increasing the risk of fracture.