

Summary of: Tooth loss and osteoporosis: to assess the association between osteoporosis status and tooth number

J. Darcey,¹ K. Horner,² T. Walsh,³ H. Southern,⁴ E. J. Marjanovic⁵
and H. Devlin⁶

FULL PAPER DETAILS

¹Speciality Registrar and Honorary Lecturer in Restorative Dentistry, ²Professor of Oral and Maxillofacial Imaging, ³Senior Lecturer in Evidence Based Dentistry, ⁶Professor in Restorative Dentistry, University of Manchester, School of Dentistry, Higher Cambridge Street, Manchester, M15 6FH; ⁴Dental Hygienist, Bolton, BL2 4NY; ⁵Research Associate Arthritis Research UK Epidemiology Unit, School of Translational Medicine - Epidemiology Research Group
*Correspondence to: James Darcey
Email: james.darcey@cmtf.nhs.uk

Refereed Paper

Accepted 29 October 2012

DOI: 10.1038/sj.bdj.2013.165

⁶British Dental Journal 2013; 214: E10

Background Osteopenia and osteoporosis are conditions characterised by a reduction in bone mineral density. There is contradictory evidence whether osteoporotic patients have greater tooth loss than non-osteoporotic patients. **Objective** To investigate the association between tooth number and osteoporotic status, taking into account the effect of other confounding variables such as age, smoking status, alcohol consumption and the use of hormone replacement therapy. **Setting** Three hundred and fifty-nine patients were recruited from the Manchester region between March 2008 and June 2010. **Subjects and methods** Data were collected on osteoporotic status, smoking status, alcohol consumption, age and the use of hormone replacement therapy. Dental panoramic tomographs were taken for each patient and the teeth present were charted and counted. Data were analysed using SPSS software (version 19). **Results** Complete data was available for 333 patients. Twenty-seven percent of individuals (90) were classified as osteoporotic. There was a significant relationship between molar tooth number and osteoporotic status ($p = 0.017$, 95% CI -1.339 to -0.137). **Conclusion** Clinicians should inform osteoporotic patients they may be at greater risk of tooth loss and instigate more intensive preventive regimens for these individuals.

EDITOR'S SUMMARY

In the year 2000 I suggested somewhat tongue-in-cheek to a young colleague who asked what I thought might be the best route to a successful career in dentistry in the twenty-first century that periodontology offered the widest scope. When challenged further I opined that before very much longer periodontal disease would be linked, primarily through the mediation of inflammation, to most other diseases, making periodontologists the centre of the dental and medical world.

With expanding research in this field, periodontology is now being investigated in its possible links to pregnancy, heart disease, diabetes and rheumatic conditions to mention just four areas. This current research paper adds a further possibility, that of a link between periodontal disease and osteoporosis through the connection of tooth loss.

In concluding that there was a significant correlation between tooth loss and osteoporosis for the 333 individuals included in the study, the authors quite rightly then speculate on the possible further association with inflammatory periodontal disease. Of course there are other local and systemic factors that exert an influence on tooth loss and more research is required. However, posing the possibility of a link opens up wider speculation on the potential role of cytokines so intimately implicated in the various connections alluded to above.

It seems increasingly intuitive that investigation into the part played by inflammation in a variety of conditions that afflict mankind will sooner or later bring forth significant results which will enable greater understanding and, hopefully, improved preventive and treatment possibilities. We have some way to go and, as these authors point

out, there is much soul searching and redoubling of effort to get there. But get there we will and this piece of research adds a further important piece to the evolving jigsaw.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 214 issue 4.

Stephen Hancocks
Editor-in-Chief

DOI: 10.1038/sj.bdj.2013.192

TO ACCESS THE BDJ WEBSITE TO READ THE FULL PAPER:

- BDA Members should go to www.bda.org.
- Click the 'login' button on the right-hand side and enter your BDA login details.
- Once you have logged in click the 'BDJ' tab to transfer to the BDJ website with full access.

IF YOUR LOGIN DETAILS DO NOT WORK:

- Get a password reminder: go to www.bda.org, click the login button on the right-hand side and then click the forgotten password link.
- Use a recommended browser: we recommend Microsoft Internet Explorer or Mozilla Firefox.
- Ensure that the security settings on your browser are set to recommended levels.

IF YOU HAVE NOT YET SIGNED UP TO USE THE BDA WEBSITE:

- Go to www.bda.org/getstarted for information on how to start using the BDA website.

IN BRIEF

- Raises awareness of osteoporosis among general dental practitioners.
- Highlights the impact of osteoporosis upon oral health must be considered by general dental practitioners.
- Demonstrates greater molar tooth loss in osteoporotic patients.
- Suggests practitioners should warn osteoporotic patients of this and instigate more intensive preventive regimens.

COMMENTARY

Increasingly in dentistry we are considering more and more a patient's medical history, the overall health of our patients and the impact that that can have on their dental disease status.

This interesting paper considers whether there is a connection between osteoporosis and tooth loss as there is conflicting evidence in the literature with respect to this.

The research team in Manchester has a history of considering osteoporosis specifically and its relationship to dental disease; and also whether dental radiographs might be used in earlier diagnosis of osteoporosis, which is of course a very distressing condition. The paper concluded that there was a significant correlation between tooth loss and osteoporosis for the 333 individuals included in the study. It very honestly also points out that there may well be local or other systemic factors that exert a greater influence on tooth loss and that clearly more research is required. Based on the evidence, the researchers suggest that patients should be informed if they are osteoporotic that they may be at a greater risk of losing molar teeth in the future. They also suggest that these patients should be reviewed more frequently because their risk is higher and their oral hygiene and preventive measures should be targeted specifically. This seems reasonable and intuitively seems correct, based on the evidence and the findings of this study and very much fits with the targeting of preventive treatments to high priority groups.

It is important to note that much more research is required. Very often studies of this type raise more questions than provide clear answers, which is the very nature of clinical research itself. I, however, suspect that we will achieve a greater understanding of the oral impact of osteoporosis in the coming years.

Professor Paul Brunton
 Professor of Restorative Dentistry /
 Director of Student Education
 Leeds Dental Institute

AUTHOR QUESTIONS AND ANSWERS**1. Why did you undertake this research?**

The existing literature gives mixed messages about the relationship between osteoporosis and oral health, particularly periodontal disease, so we wanted to improve knowledge about this. Some of the authors also have a long-standing interest in how dentists can identify patients at high risk of having undiagnosed osteoporosis using dental radiographs, so have spent time talking to sufferers and have recognised their interest in how the disease affects their teeth.

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

The pathological process that may link osteoporosis and premature tooth loss is poorly understood. It has been suggested that this may be due to an association between periodontal disease and osteoporosis. In osteoporotic patients there may be an increased circulation of inflammatory cytokines, predisposing to periodontal ligament breakdown. Furthermore bone of low mineral density may be less resistant to the inflammatory changes in chronic periodontitis. Thus there may be accelerated breakdown of alveolar bone in these individuals. The current study was cross-sectional, so we would like to go back to the patients as part of a longitudinal study to assess their periodontal status after a period of some years. In the future, it would also be worthwhile looking at responses to prevention and treatment compared with a control group. These patients are usually highly motivated and may respond well to prevention.