

**SCIENTIFIC  
SECTION**

## Commentaries on scientific papers published in this edition

### **The effects of a static magnetic field on orthodontic tooth movement**

**Minako Sakata, Yoshitake Yamamoto,  
Nobuyoshi Imamura, Shunsuke Nakata,  
Akihiko Nakasima**

The use of rare earth magnets to generate tooth-displacing forces is not a new concept in orthodontics, but the practical difficulties associated with this technique have meant that widespread uptake has not taken place. However, the present study has taken the idea of utilizing magnetic fields in the orthodontic clinic a step forward. What these investigators have demonstrated is that orthodontic space closure can be accelerated in rats if it takes place within a static magnetic field and significantly, this is not associated with the production of any hyalinized tissue or the appearance of any significant root resorption. The mechanism was not investigated at a cellular level but is likely to be mediated via a direct effect upon osteoblasts within the periodontal ligament. There are some obvious clinical applications associated with these findings; in particular, magnetizing the components of a fixed appliance may allow more rapid tooth movement or at the very least, afford some protection to the periodontium with regard to potential damage during active tooth movement. These potential changes may be useful during space closure, but also in other types of tooth movement including molar distalization, tooth alignment and arch expansion. However, before we get too excited, it should be remembered that in this study the rats were housed in a magnetized chamber, which may be a little difficult to achieve in the average orthodontic clinic. There may also be long-term problems associated with exposure to a static magnetic field. However, these results are interesting and certainly warrant further investigation.

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### **Digit sucking in children resident in Kettering (UK)**

**Anjali Patel, Julian O'Neil**

Most dentists have observed the effects that a persistent digit sucking habit can have on the developing dentition,

however there have been few recent studies that have looked at the prevalence of this habit in the UK. This investigation used a retrospective questionnaire to examine the prevalence of habits in 7- to 11-year-old school children from a small town in the middle of England. The authors are to be commended for using focus groups to identify the issues and questions that were of importance to all interested parties in the research. Despite an extensive advertizing campaign involving local newspapers and radio to raise awareness of the investigation the response rate was a slightly disappointing 40% of children in the relevant age groups from the 11 primary schools that agreed to take part. The authors point out that research in schools is very much dependent upon the enthusiasm of the senior staff, who might consider the imposition on a crowded curriculum to be too disruptive; however only two of the schools that were approached declined to take part.

There was a high prevalence of reported digit and dummy sucking in the sample with 70% of children and parents recalling a habit. This confirms the results of studies carried out in other countries, notably Scandinavia. Most individuals had ceased the habit by the age of 7 years, but it persisted in a significant minority (12%), although only in a quarter of these was the habit consistent enough to have a potential effect on the teeth. It is also noteworthy that the majority of those with a prolonged habit wished to give it up, but only a quarter had sought advice about how to do this and it is essential that both the general practitioner and the specialist are prepared to provide that advice.

Studies involving retrospective questionnaires can be criticized because participants might not be able to accurately recall experiences from several years previously or might be tempted to give answers that they think the researcher wants to hear. By obtaining the views of children and parents the authors have provided some cross-referencing or triangulation to help validate the data; however they state that because there was good agreement between the child and parental responses they were not able to rule out collusion when the questionnaires were completed. Future studies should try to minimize this by obtaining responses as independently as possible. In addition, a more accurate determination of the extent of the prolonged habit might be obtained by asking participants to complete prospective written or video diaries.

One limitation of the study, when generalizing it to the wider population, is the demographic of the sample. Although there were equal numbers of boys and girls, 90% were of white ethnic origin and over half were from affluent areas; however the authors are to be congratulated for the work they have done to, in their own words, provide a 'template' for a wider study to investigate the prevalence of digit sucking throughout the UK.

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## Does Oral Health Promotion Influence the Oral Hygiene of Gingival Health of Patients Undergoing Fixed Appliance Orthodontic Treatment? A Systematic Review

Darren Gray, Grant McIntyre

This systematic review confirms the findings of earlier broader-based reviews.<sup>1-4</sup> All have identified that oral health education, at best, delivers a small, short term improvement in plaque removal and gingival health and, at worst, has no effect. However, the authors correctly assert that the findings should be interpreted with caution and that high quality, long-term studies with standardised outcome measures are required. Nonetheless, the findings are vexing for orthodontic teams as it might be assumed that the promise of orthodontic treatment would make patients more receptive to such messages.

Recent NICE guidance has highlighted the difficulties in changing health-related behaviour; simply increasing individuals' knowledge will rarely lead to long-term changes in attitude and behaviour. Behaviour is more than just a lifestyle choice, but is also a complex interaction of socio-economic and environmental influences.<sup>5</sup>

So, does this mean that orthodontic teams should not bother to try to change their patients' behaviour to improve their oral hygiene? Given the increased risk of demineralisation and gingivitis during orthodontic treatment, the fact that four of the six RCTs included in the review reported a short-term effect support its continuation. However, any health education strategy employed should include well defined goals for the patient that are tailored to their individual needs and that are realistic about the patient's ability to change.<sup>6</sup> Moreover, focusing on modifying existing behaviours

is likely to be more effective in improving gingival health – for example, encouraging the use of certain powered toothbrushes and promoting the use of appropriate toothpastes and mouthrinses.<sup>7</sup>

The term 'oral health promotion' has been used in the title of this review. However the studies included evaluated health education interventions. Although health education is a key health promotion activity, it contributes to only one of five strategy areas that should be considered when aiming to improve health at individual and population levels.<sup>8</sup> The other four strategy areas aim to address the socio-economic and environmental influences that impact on health and health behaviour. Consequently, it would have been more accurate to use 'health education' in the title of this review.

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