

# HKU Faculty of Dentistry study supports safety of tooth-straightening treatment

A study conducted by researchers at the HKU Faculty of Dentistry has provided the first piece of evidence that orthodontic (tooth-straightening) therapy is not associated with a widespread defence (immune) response in the body.

Some studies have found associations of raised concentrations of proteins that indicate tissue inflammation (inflammatory markers) with heart and blood vessel disease in adults and with depression and obesity in adolescents. Other studies have suggested that oral health is tied to long-term general health because the gum's swelling and redness in reaction to trauma (periodontal inflammation) might affect inflammation in the rest of the body, or mouth bacteria and their products might spread throughout the body through the bloodstream. However, it is currently unknown if local changes in the mouth caused by orthodontic therapy are associated with a long-term inflammatory response throughout the body.

To provide the first set of data on whether orthodontic therapy is linked to general health, Dr James MacLaine, [Professor Bakr Rabie](#), and [Dr Ricky WK Wong](#), all from the Discipline of Orthodontics at the HKU Faculty of Dentistry, performed orthodontic therapy on a group of children and monitored their blood for indicators of general inflammation.

The study group consisted of 11 girls and 6 boys whose average age was about 13 years. All patients were healthy at the start of the study, did not have any gum disease, and were not receiving any drug treatment. All received fixed braces attached to an external orthodontic appliance (distalising headgear) to align their teeth. The researchers also took blood samples from the children before orthodontic therapy and again at months 2, 4, and 6. At each time point, they measured the concentrations of three inflammatory proteins in the blood: C-reactive protein, tumour necrosis factor  $\alpha$ , and interleukin 6.

According to the children's own time charts, they wore the special headgear for an average of 8 hours a day during the study. Health questionnaires that were administered at the follow-up visits showed that all the children maintained good general health. None of the three

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inflammatory markers in the blood showed any significant changes in concentration. They all remained near pre-treatment levels (overall mid-point values, 0.069 mg/mL, 1.084 pg/mL, and 0.917 pg/mL for C-reactive protein, tumour necrosis factor  $\alpha$ , and interleukin 6, respectively), which were considered normal.

Although future studies could be longer, these 6-month findings indicate “a lack of systemic immune activation” during fixed-appliance orthodontic treatment, the researchers note. The unchanged levels of inflammatory markers in this study therefore “add weight to the argument that orthodontic tooth movement is not a pathological event” and show that orthodontic therapy is “immunologically safe”, they conclude.

The study was published in 2010 in the *European Journal of Orthodontics*.

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**Source:** MacLaine JK, Rabie ABM, Wong R. Does orthodontic tooth movement cause an elevation in systemic inflammatory markers? *Eur J Orthod* 2010;32:435-440.

Medline link: <http://www.ncbi.nlm.nih.gov/pubmed/19822530>

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