

## Bleach damages teeth?

Source : Lianhe Zaobao, Section 1, Page 7 (8 October 2004)



With modern man's pursuit of a beautiful smile, teeth bleaching has become a fad. All kinds of teeth bleaching products can be easily purchased from pharmacies. However, there is no conclusion as yet to the effects of bleach on teeth.

Recently, the Department of Restorative Dentistry, National University Hospital (NUH) and the Department of Bioengineering, National University of Singapore (NUS) conducted a joint study on teeth bleaching. They found that immersing teeth in concentrated hydrogen peroxide for 24 hours causes certain damage to the hardness and elasticity of the dentine and enamel. Hydrogen peroxide, the active ingredient in most commercially available bleaches, is highly corrosive.

However, the researchers also pointed out to LHZB that commercially available bleaches normally have low concentrations of hydrogen peroxide. Furthermore, people usually will not leave hydrogen peroxide on their teeth for over 24 hours.

Still, the research findings can serve as a useful reference. It proves the corrosive power of hydrogen peroxide on teeth structures. This will help firms develop less damaging bleaches for teeth.

Dentine is a hard substance that forms the main structure of teeth. The extremely hard layer on the exterior of the crown is called enamel. Together, the two substances are the main components of teeth.

The research team applied nanomechanics analysis and found that soaking teeth in concentrated hydrogen peroxide causes damage varying from 13% to 55% to the hardness and elasticity of the dentine and enamel.

The damage to dentine hardness is relatively significant, between 29% to 55%, while the elasticity of the dentine was also reduced by 19% to 43%. This shows the damage of concentrated hydrogen peroxide on the internal structures of teeth.

Dr Chng Hui Kheng, Department of Restorative Dentistry, NUH, said there are two kinds of teeth bleaching. External bleaching is more common. A small number of patients require internal bleaching because their teeth have suffered damage or decay.

Dr Chng said: "In these cases, the colour of their teeth is affected because the blood vessels and nerves in the teeth have died. Thus, internal bleaching is necessary to recover the colour of the teeth. Higher concentrations of hydrogen peroxide are used. Still, hydrogen peroxide cannot be left on the teeth for too long."

Associate Professor Lim Chwee Teck, Department of Bioengineering, NUS, said they used nanomechanics to analyze teeth structure as there are many nanostructures in human cells. Average microscopes do not allow a genuine understanding of the structural changes under different conditions.

A/Prof Lim said: "This research is a good start. We will continue to look into the mechanism by which hydrogen peroxide affects the hardness and elasticity of teeth. We will also develop less damaging teeth bleaching methods."

The researchers also pointed out during the interview that, while commercially available teeth bleaching products may be less damaging, consumers should still use sparingly and avoid leaving the bleach on their teeth for long hours, because the structure of their teeth could be damaged in the process.