Nitrous-oxide anaesthesia more likely to trigger heart attacks

Daniel Zimmermann

HONG KONG/LEIPZIG, Germany: Nitrous-oxide anaesthesia may increase the possibility of having a heart attack after surgery, research from Australia suggests.

In looking at the long-term risks of cardiovascular events, a team from the Royal Melbourne Hospital found that the administration of nitrous oxide, commonly known as laughing gas, was associated with myocardial infarction.

The findings may alarm dentists worldwide who still use nitrous-oxide anaesthetics for dental surgery, including simple procedures like tooth extraction. According to the study, three times more patients of a group of patients who had received nitrous-oxide anaesthetics died after 50 days than patients who had been exposed to non-nitrous-oxide sedation. The trial included over 2,000 patients undergoing non-cardiac surgery in different hospitals in Australia and China between 2003 and 2004.

However, a follow-up study after three years revealed that nitrous oxide increased neither the risk of a stroke amongst the survivors of the patients who had received nitrous-oxide anaesthetics. Significant predictors of death were advanced age, male gender, abdominal surgery and propofol maintenance. In addition, the only significant predictor of strokes was advanced age.

Nitrous oxide is said to increase the concentration of plasma homocysteine in human blood. This induces oxidative stress and potentially destabilises coronary artery plaques, which can dislodge and block life-supporting blood vessels. Earlier studies found that the long-term occupational exposure to nitrous oxide of medical and dental professionals is associated with numbness, difficulty in concentration, paraesthesias and impairment of equilibrium.

Alternative sedations for dental surgery include drug-based anaesthetics like lidocaine, articaine or bupivacaine.

Previous studies conducted in the country have indicated the general prevalence of adult gingivitis in China as between 50 and 100 per cent. The researchers said that their new, more detailed findings could help in the industrial development of better treatment methods or oral hygiene products that allow to combat gum disease according to its prevalence in the Chinese population.

Mild and moderate gingivitis has been associated with pre-term birth, cardiovascular disease and diabetes, amongst other diseases.
Japanese scientists develop replacement for dental metal

Yvonne Bachmann
DTI

HONG KONG/LEIPZIG, Germany: Scientists from the Kyoto University in Japan have developed a new alloy similar to palladium, a rare metal used in dental restorations. The element was produced by mixing molecules of silver and rhodium, two elements chemically similar to palladium, and could be the first step in producing synthetic alternatives for other rare earths, the researchers told the Yomiuri Shimbun newspaper in Tokyo.

Palladium only naturally occurs in some parts of Russia, South Africa, Canada and the US. Besides its use in dentistry, it is found in automotive catalysts, jewellery and essential components for consumer electronic products, amongst other things. A 2010 report by US chemical company Johnson Matthey estimates that 5 to 6 per cent of the annual demand comes from dentistry for crowns or bridgework. Japan continues to utilise the largest amount of dental palladium despite other treatment options, such as all-ceramic crowns, according to the same report.

The researchers have begun joint research projects with the Japanese industry but say the new alloy will be difficult to produce commercially.

Metal experts, however, are sceptical of the announcement. "It does look like they have managed to create 'nanoparticles'—an often abused phrase—of rhodium and silver, which would normally be using traditional melting techniques," Johnson Matthey General Manager Peter Duncan told the South African magazine Mining Weekly. "It is very common for Japanese academics to patent anything vaguely new, regardless of its potential in the commercial world."

Japanese experts said that synthetic replacements for rare metals could make Japan more independent of countries like China, which currently produces over 90 percent of rare metals in the world.