

Form of Mercury in Older Dental Fillings Unlikely to be Toxic: Study

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(PhysOrg.com) -- Amid the on-going controversy over the safety of mercury-containing dental fillings, a University of Saskatchewan research team has shed new light on how the chemical forms of mercury at the surface of fillings change over time.

Their work, just published in the American Chemical Society journal *Chemical Research in Toxicology*, shows that the surface forms of [mercury](#) in older “silver” fillings (also known as amalgams) may be less toxic than previously thought.

“The dental amalgam on the surface of an old tooth filling may have lost as much as 95 per cent of its mercury but what’s left is in a form that is unlikely to be toxic in the body,” said U of S Canada Research Chair Graham George who led the study.

But the team cautions that due to the significant mercury loss over time, human exposure to mercury lost from fillings is “still of concern” and that further research is needed to determine when, how and in what form mercury is lost from fillings.

Mercury-based fillings have been used by dentists to repair teeth for well over a century. But in recent decades, their use has become controversial due to concerns about exposure to potentially toxic mercury.

“Mercury can potentially exist in several different chemical forms, each with a different toxicity,” said George. “Prior to our work, little was

known about how the chemical forms of mercury in dental amalgam might change over time.”

The team used a special X-ray technique at the Stanford Synchrotron Radiation Lightsource to probe the amount and chemical nature of mercury at the surface of both freshly prepared metal fillings and aged fillings (about 20 years old) obtained from the U of S dental clinic’s tooth bank.

While the fresh fillings contained metallic mercury, which can be toxic, aged fillings contained a form of mercury called beta-mercuric [sulfide](#) or metacinnabar which is unlikely to be toxic in the body. For this reason, grinding or polishing during dental cleaning is unlikely to cause any toxic effects.

But of potential greater concern is the nature of the surface mercury lost from fillings. This may be due to evaporation (with subsequent inhalation and leaching of mercury into saliva), exposure to some kinds of dental hygiene products such as those containing peroxides, exposure to certain sulphur-containing foods (such as onion and garlic or coffee), or other factors.

“Possibly this missing mercury is in the less toxic form of mercury (metacinnabar) abraded from the surface of the filling. Or alternatively, it may be mercury lost prior to formation of the metacinnabar through various types of exposures,” said George.

In North America, the traditional view is that the advantages of mercury-containing amalgam outweigh any possible health risks, and for this reason, mercury-containing dental amalgams are still widely used.

Other members of the team include Satya Singh, Jay Hoover, and Canada Research Chair Ingrid Pickering. This project was supported by

a grant from the Canadian Institutes of Health Research.

More information: Published in *Chemical Research in Toxicology*, Articles ASAP (As Soon As Publishable); Publication Date (Web): October 20, 2009 (Communication); Graham N. George, Satya P. Singh, Jay Hoover and Ingrid J. Pickering; "The Chemical Forms of Mercury in Aged and Fresh Dental Amalgam Surfaces".

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