Summary of: Relationship between mercury levels in blood and urine and complaints of chronic mercury toxicity from amalgam restorations

J. Eyeson,¹ I. House,² Y. H. Yang³ and K. A. A. S. Warnakulasuriya⁴

FULL PAPER DETAILS

¹Formerly Lecturer/Hon SpR in Oral Surgery, King's College London; ²Biomedical Scientist, Medical Toxicology Unit, Guy's and St Thomas' NHS Foundation Trust, London; ³Biostatistician, Graduate Institute of Oral Health Sciences, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan; ⁴Professor/Consultant Department of Oral Medicine, King's College London Dental Institute at Guy's, King's and St Thomas' Hospitals, London and WHO Collaborating Centre for Oral Cancer & Precancer, United Kingdom
*Correspondence to: Professor S. Warnakulasuriya
Email: s.warne@kcl.ac.uk

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Aim To determine whether patients complaining of oral and medical symptoms perceived to be associated with chronic mercury toxicity have elevated mercury levels in their blood and urine. **Methods** The study group in this audit were 56 patients presenting to an oral medicine unit with complaints perceived to be related to chronic mercury toxicity. Their symptoms and co-morbidity were charted and mercury levels in blood and urine were biochemically tested by atomic absorption spectrophotometry. **Results** None had elevated mercury levels in blood or urine above the normal threshold level. Subgroup analysis showed subjects with oral lesions, autoimmune disorders and multiple sclerosis had relatively and significantly higher mercury levels within this cohort, but within the threshold values. When tested by multiple logistic regression adjusted for age and gender, mercury levels in blood or urine, numbers of amalgams were not significant for multiple sclerosis or previously diagnosed autoimmune disease. **Conclusion** Mercury levels in blood and urine of this cohort of patients with perceived chronic mercury toxicity were within the normal range in accordance with a national laboratory threshold value.

EDITOR'S SUMMARY

The use of amalgam as a restorative material in dentistry will continue to be a source controversy for as long as it survives the pressure of the ecology and environmental lobby to substitute it with other options. There is, after all no such thing as a 'safe' substance since everything can be a poison when consumed or given exposure to beyond a certain dose. Ultimately the irony may be that composite materials turn out to be more toxic to individuals than mercury containing fillings even if they are, arguably, less harmful to the environment. In spite of all of which mercury will continue to be spewed out by the natural world of volcanic eruptions to mention but one major source.

To all this can be added the fact that many studies throughout the world using many methodologies in many different populations and in very varied circumstances have failed to find any significant links between amalgam restorations and systemic ill health. One

might therefore be forgiven in believing that the connection between the two was no longer a viable concern. Not so, as we well know.

By testing the blood and urine of patients who had been referred with complaints suspected as being due to chronic mercury toxicity, this piece of research adds to our knowledge by having found no evidence at all of significantly raised mercury levels in these body fluids. While the results suggest that the criteria for referral, or at least the understanding of the possible causes of mercury toxicity and its symptoms need better understanding, they also suggest that there may be a psychological basis as much as a physiological basis for the patient seeking care in the first place.

It is complications such as these that have muddled the water over the years, or as we might say in an electronic age, provided much 'background noise' which has not made life easier for researchers in this field nor those

of us attempting to argue a case free of emotive subjectivity.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 208 issue 4.

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IN BRIEF

- Study adds to biochemical knowledge surrounding use of dental amalgam.
- Controversies in relation to dental amalgam safety are explored.
- Provides an insight to objective biochemical investigations of the safety of dental amalgam.
- No correlation was found between perceived amalgam toxicity and mercury levels in blood and urine.

COMMENT

The possibility that mercury of dental amalgams may give rise to systemic disease remains controversial, particularly when suggestions of an association with neurological disease such as multiple sclerosis are proposed. In addition some patients with an array of sometimes clinically challenging symptoms strongly believe these reflect a sensitivity or toxicity related to mercury from amalgam dental restorations.

Eyeson and colleagues found that mercury levels in blood and urine were not elevated in a group of 56 patients having a plethora of different symptoms who each believed that these were the consequence of chronic mercury toxicity. No association between a specific oral or systemic symptom or self-reported medical disorder was found.

The present results thus do not establish that increased mercury, whatever its source, is a likely cause of self-reported mercury toxicity. It does not of course exclude the possibility of mercury within dental amalgam causing oral or systemic disease. A notable feature of the study group was the lack of consistent symptomatology (perhaps accounting for their consultations with various different specialties). It could be suggested that the pattern of symptoms may reflect psychological rather than physical causation, but without appropriate clinical assessment this cannot be concluded.

To prove that mercury of dental restorations does give rise to oral and/or systemic disease there is a need for

a long-term prospective study that assesses the psychological and physical status of patients together with mercury levels and dental amalgam load. However this is likely to require considerable collaboration between researchers with different expertise and considerable funding and might be ethically challenging. Of course the continued gradual reduction in the use of dental amalgam will itself later prove if mercury used in dentistry does indeed give rise to oral or systemic disease. Certainly for now patients who believe that they have symptoms that reflect mercury toxicity should not seek the advice of commercial practitioners as none of the 20 patients who were labelled as having this by such practitioners did not have elevated blood and urine mercury levels when appropriately investigated.

S. Porter

Director and Professor of Oral Medicine,
UCL Eastman Dental Institute, London

AUTHOR QUESTIONS AND ANSWERS**1. Why did you undertake this research?**

Dental amalgam is the most widely used restorative material globally in dentistry. Although it has been used for many years, its use has and still remains controversial due to the mercury content. There are reports both for and against dental amalgam use. We sought to apply the objective measures of mercury in blood and urine to determine whether patients with perceived mercury toxicity due to the presence of dental amalgam in the oral cavity would have systemic mercury levels in their body fluids higher than normal.

2. What would you like to do next in this area to follow on from this work?

We would like to see the findings of this study enhanced through the analysis of these objective parameters in a larger cohort of patients, and compared with matched controls. The methods reported here can be used to provide biochemical validation for the assessment of mercury levels in blood and urine in individuals with perceived mercury toxicity secondary to dental amalgam use and to reassure such patients. Future research should evaluate the relationship between mercury levels in blood and urine to number of amalgams and presenting complaints/conditions. Analysis of such data will contribute invaluable information given to patients to help them arrive at an informed decision on the safety of dental amalgam use.