

# Multiple sclerosis, dental caries and amalgam fillings — is there an association?

*Multiple sclerosis, dental caries and fillings: a case-control study* C. W. McGrother, C. Dugmore, M. J. Phillips, N. T. Raymond, P. Garrick, and W. O. Baird *Br Dent J* 1999; 187: 261-264

## Objectives

To investigate the association between multiple sclerosis, dental caries, amalgam fillings, body mercury and lead.

## Design

Matched case-control study.

## Setting

Leicestershire in the years 1989–1990.

## Subjects

Thirty-nine females with multiple sclerosis (of recent onset) were matched with 62 controls for age, sex and general practitioner.

## Methods

Home interview of cases and controls within which there was an assessment of the DMFT index and blood and urine mercury and lead levels.

## Results

The odds of being a MS case increased multiplicatively by 1.09 (95% CI 1.00, 1.18) for every additional unit of DMFT index of dental caries. This represents an odds ratio of 1.213 or a 21% increase in risk of MS in relation to dental caries in this population. There was no difference between cases and controls in the number of amalgam fillings or in body mercury or lead levels.

## Comment

There are occasions when the dental profession groans audibly at yet another media disinformation campaign perhaps linking cancer and Down Syndrome with water fluoridation — or indeed linking multiple sclerosis with amalgam restorations. However, it behoves us all, as scientists, to examine the facts, sift the evidence, and keep an open mind until there is sufficient robust information before we authoritatively advise our patients. Perhaps you remember the publicity of the ‘miracle cures’ reported in patients with multiple sclerosis after having all their amalgam fillings replaced. Perhaps, like me, you thought that MS is a disease which is characterised by remissions and relapses and patients were clutching at straws in the vain attempt to produce a miracle.

This research project investigates the emotive argument in a very scientific approach so that we can produce some evidence-based dentistry as far as MS sufferers are concerned. The subjects and controls

were identified according to rigorous criteria but although, there was a response rate of 81% in the MS study group there was a lower 59% response rate in the matched control group. It is, perhaps, important to note that there was a tendency for the MS cases to be relatively disadvantaged in relation to employment and major financial commitments to home and car ownership despite similar levels of educational attainment.

As far as the dental findings were concerned, there was a significant relationship between MS and dental caries with a mean difference of 2.24 carious teeth between MS cases and controls. What is also very important is that there was *no* significant difference in the number of teeth filled with amalgam. There was evidence, though, of wholesale replacement of fillings with non-amalgam materials in four of the MS cases.

However, is this cause and effect? The old, old question of which comes first — the chicken or the egg, must come to mind.

There was a significant correlation between body mercury levels and the number of teeth filled with amalgam (controls:  $r = +0.430$ ,  $P = 0.006$ , cases:  $r = +0.596$ ,  $P = 0.001$ ).

## Conclusion

There was evidence of excess dental caries among MS cases compared with the controls. This finding supports the strong geographical correlation between the two diseases. A further study of this association is recommended.

## In brief

- MS patients have more dental caries than age-sex matched controls. This difference is unlikely to be secondary to MS and may be causally associated in some way.
- Levels of mercury in the body are not higher in MS patients compared with controls suggesting mercury is unlikely to be a causal factor for MS.
- Levels of mercury in the body were related to the number of teeth filled with mercury.
- Further research should concentrate on the possible aetiological connection between dental disease and MS.

Should we postulate that the differences in dental caries arose after the onset of MS because of all sorts of compensatory dietary factors, or as a result of its debilitating nature? Or does *Streptococcus mutans* have an important effect on the activation of the immune mechanism involved in demyelination in MS as well as dental caries?

There are very important conclusions that we can draw from this study. First that there is a correlation between multiple sclerosis and dental caries. Secondly, there is no association between multiple sclerosis and the numbers of amalgam fillings or body mercury. Thirdly, without doubt, we still have many more questions to answer in this field but this research project has furthered our evidence base in advising our patients.

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