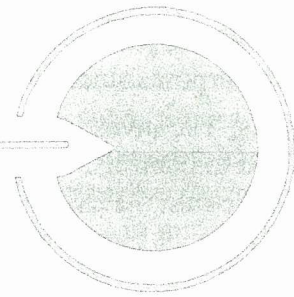


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MERCURY AND THE EPSTEIN-BARR VIRUS

The Epstein-Barr virus (EBV) causes infectious mononucleosis and has been linked to two forms of cancer, Burkitt's lymphoma and nasopharyngeal carcinoma. More recently, it has been suspected as the causative agent in Chronic Fatigue Syndrome, a mysterious and rapidly proliferating disease state. The EBV has the specific characteristic of attacking and damaging the cells of the immune system.

Using the highly sophisticated micro-PIXE (particle induced X-ray emission) technique, which is capable of investigation directly within cells, a research team at Uppsala University in Sweden has been studying the EBV and the effect of intracellular mercury. Their initial findings were reported at a medical symposium in 1988. The abstract of that report follows.

ABNORMAL IMMUNE RESPONSE TO EPSTEIN-BARR VIRUS INFECTION AND EVIDENCE OF TOXIC EVENTS ON A CELLULAR LEVEL.

Lindvall, A; Lindh, U; Linde, A; Grönquist, SO; Friman, G.

Department of Infectious Diseases and Department of Radiation Sciences, Uppsala University, Sweden, and Department of Virology, National Bacteriological Laboratory, Stockholm, Sweden.

International Congress for Infectious Diseases. Rio de Janeiro, Brazil. April 17-21, 1988. Abstract.

Chronic illness in association with serological evidence of persistent active Epstein-Barr virus (EBV) has been observed by several investigators in recent years. The role of the virus as a causative agent has not yet been determined. We have investigated 27 patients with chronic malaise and 27 healthy controls. In addition to EBV serological testing we have analyzed individual blood cells for the content of heavy metals, using a nuclear micro-probe, in order to assess possible environmental exposure of importance to immune functions.

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Methods: An EBV serology panel, using indirect immunofluorescence, was employed for concurrent measurements of all serum samples at a single laboratory. Red and white blood cells from venous blood samples were separated and prepared according to techniques described elsewhere. The measurements of elemental concentrations in 20 red and 20 white blood cells were performed in the Studsvik Nuclear

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Micro-probe at the Studsvik Science Research Laboratory.

This method, particle induced X-ray emission for small targets (micro-PIXE) has been in routine use for research purposes since 1983.

Results: The investigated group of patients displayed a significant increase of EBV antibody titers as compared to controls. The discriminative power could be increased by using a scoring technique in each case. In the micro-PIXE determinations 80% of the patients had detectable amounts of mercury in one or more of the cells measured as compared to none in the control group. The detection limit was 0.5 ug/g dry substance.

Conclusion: Our serological results compare well to findings presented by other investigators in the field of chronic active EBV infections. In addition, an abnormal presence of mercury in blood cells was noted. Mercury, a heavy metal with known toxic properties in even minute quantities, has immuno-modulatory effects in mammals. Our finding of intracellular mercury in cases with apparent evidence of an immuno-regulatory dysfunction warrants further elucidation.

BIO-PROBE COMMENT: These dramatic findings should have a vital impact on the consideration of chronic exposure to low levels of mercury, as occurs in subjects with mercury/silver amalgam fillings. Further evidence of the findings of open-minded, competent researchers at reputable institutions can be found in another recently published study. The researchers are from the renowned Karolinska Institute in Stockholm, Sweden and the University of Southern California School of Dentistry.

MERCURY ACCUMULATION IN TISSUES FROM DENTAL STAFF AND CONTROLS IN RELATION TO EXPOSURE.

Nylander, M; Friberg, L; Eggleston, D; Bjorkman, L.

Swed Dent J. 13:235-243. 1989. Abstract.

Samples, mainly from occipital cortex and pituitary gland, but also from renal cortex, olfactory bulbs, thyroid gland, and liver were collected from autopsies of 8 dental staff cases and 27 controls. These samples were analyzed for total mercury content using radiochemical neutron activation analyses.

The results revealed high mercury concentrations (median 815, range 135-4,040 mcg Hg/kg wet weight) in pituitaries from the dental staff cases compared to controls (N=23, median 23, range 6-1,170 mcg Hg/kg). In occipital cortex, the cases had a median of 17, range of 4-300 mcg Hg/kg and the controls (N=20) had a median of 10, range 2-29 mcg Hg/kg. A few samples from olfactory bulbs show low mercury concentrations for both cases and controls. Renal cortex was analyzed from three cases and contained clearly higher concentrations (945, 1,545, 2,110 mcg Hg/kg) compared to controls (N=12, median 180, range 21-810 mcg Hg/kg). There is no control material for the other analyzed samples, but one thyroid sample had an extremely high concentration of 28,000 mcg Hg/kg.

BIO-PROBE COMMENT: The technique and approach of this research team is worthy of note. Previously published research by this group established that neutron activation analysis (NAA) is more efficient than atomic absorption spectroscopy (AAS) for the detection of mercury. On split sample analysis, NAA detected 50% more mercury than did AAS analysis of the same sample.

The much higher levels of mercury found in the pituitary gland than were found in the occipital region of the brain is a most interesting finding. The pituitary gland consists of both glandular and nervous tissue and is not protected by the blood-brain barrier. It is the master gland controlling body functions. It is also interesting to note that the authors found some correlation between the mercury content in pituitary glands and the number of surfaces of amalgam fillings present in the controls.

The findings of these two research teams plus the findings of the research group in Calgary, Canada (previously reported in the Bio-Probe Newsletter) strongly indicate a variance with papers published in defense of mercury/silver amalgam dental fillings, which invariably base their conclusions on