

DISCUSSION

*Z. Glaser*¹ (*written discussion*)—In regard to the high nickel ion content in the urine of patients after implantation of porous prostheses, is there a possibility that the source of the nickel could be another implant or a dental bridge? Is the body possibly excreting nickel from tissue or cells other than the implant site?

L. C. Jones, D. S. Hungerford, R. V. Kenna, G. Braem, and V. Grant (*authors' closure*)—As *in vivo* corrosion of metallic orthopedic implants occurs at a very low rate, other factors that may contribute to temporal changes in urinary metal ion levels have been sought. In this study, only patients undergoing a primary surgery were included (that is, no revisions). None of the patients had any other orthopedic implants. It is somewhat unlikely that corrosion and wear of dental implants contributed to the increase demonstrated in some individuals. Wear debris from dental implants would primarily be digested. Cobalt, chromium, and nickel are poorly absorbed by the intestines. Therefore, the contribution of this potential source would probably not have a significant impact on the total urinary excretion of these metal ions. No relationship between the epidemiological data gathered (age, sex, occupation, health, and so forth) and the urinary measurements was detected. However, this may be partly due to the low numbers of patients evaluated at this time. It is possible that nickel is released from the cells at the implant site due to trauma. Increases in circulating and excretory nickel levels have been correlated with other types of trauma, including myocardial infarction, acute stroke, and severe burns. The fact that increases in nickel have been observed in the areas surrounding implants, which do not contain nickel, lends support to this hypothesis. However, this hypothesis remains to be tested. A likely source of metal ion release is the debris from implantation of the components. This might vary from patient to patient, depending on the extent of lavage of the surgical site and the effectiveness of the individual's body in removing this debris from the joint cavity and implant interface.

¹ Food and Drug Administration, Rockville, MD.