COMMENTS AND RESPONSES

# Effect of Periodontitis on Overt Nephropathy and End-Stage Renal Disease in Type 2 Diabetes

Response to Varon

We thank Dr. Varon (1) for his interest in the relationship between periodontitis and kidney disease in type 2 diabetes, but we disagree with most of his statements and conclusions.

First, although our analysis (2) excluded individuals with kidney disease (macroalbuminuria or low glomerular filtration rate) at baseline, we did not exclude individuals with known risk factors for kidney disease, as Dr. Varon suggests. Rather, we used standard statistical methods to control for the effects of risk factors believed to confound the relationship between periodontitis, the exposure variable in this study, and kidney disease, the outcome variable of interest.

Second, the definition of periodontal disease adopted by the American Academy of Periodontology (3), to which Dr. Varon refers, was developed more than a decade after the collection of periodontitis data was completed in the present study. We chose not to define periodontitis by probing attachment loss in this study because these data were only available in a subset of the patients who had panoramic radiographs. A detailed description of the periodontitis classification method that we used was provided in the article, and at no time was it equated with the current clinical definition.

Third, we agree that a number of mechanisms may be involved in the striking relationship between periodontitis and diabetic kidney disease, and several putative mechanisms for this relationship were discussed. It is, of course, never possible to evaluate all possible sources of confounding, and we did not evaluate the potential confounders mentioned by Dr. Varon. We are not aware of data, however, that would implicate these variables as being related to both periodontitis and kidney disease, a requirement for them to confound the relationship. As discussed in the paper, systemic inflammation is a likely mediator of the observed association.

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**References**

1. Varon FN: Effect of periodontitis on overt nephropathy and end-stage renal disease in type 2 diabetes (Letter). *Diabetes Care* 30:e138, 2007. DOI: 10.2337/dc07-1579
2. Shultis WA, Weil EJ, Looker HC, Curtis JM, Shlossman M, Genco RJ, Knowler WC, Nelson RG: Effect of periodontitis on overt nephropathy and end-stage renal disease in type 2 diabetes. *Diabetes Care* 30:306–311, 2007
3. American Academy of Periodontology: Diagnosis of periodontal diseases. *J Periodontol* 74:1237–1247, 2003