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**Study:**



## Association between periodontitis and mortality in stages 3-5 chronic kidney disease: NHANES III and linked mortality study.

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**Relevant  
background  
to study:**

The main cause of mortality in chronic kidney disease (CKD) patients is fatal cardiovascular disease (CVD) events. Systemic inflammation is a risk factor for such events.

Several studies have demonstrated that periodontitis can elevate systemic inflammatory markers and recent reports indicate an increase in periodontitis prevalence among CKD patients.

**Study aims:**

To evaluate the association between periodontitis, in conjunction with other traditional risk factors, and mortality in individuals with stage 3-5 CKD.

**Methods:**

Data were retrospectively retrieved from NHANES III (1988-1994), a representative survey of the population in the USA, conducted by the National Center for Health Statistics (NCHS). The periodontal measurements (PPD, BoP, CAL) were performed at two sites per tooth in two quadrants, while edentulous individuals were analysed as a separate group. Periodontitis was defined according to Page & Eke (2007). Individuals with an estimated glomerular filtration rate (eGFR) of less than 60 ml/min/1.73 m<sup>2</sup> were classified as having stage 3-5 CKD.

The mortality data were also retrieved from NCHS. Periodontitis, diabetes mellitus (DM), hypertension and smoking were analysed for association with mortality in CKD patients. Where applicable, data were adjusted for age, sex, ethnicity, CKD, periodontal status, DM, hypertension, smoking, pulse pressure, history of CVD (heart attack, stroke or heart failure), alcohol consumption, albumin-creatinine ratio, serum cholesterol, body mass index, physical activity and socio-economic status.

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**Results:**

- A total of 13,784 subjects were included, of which 6% had CKD.
- Mean follow-up was 13.5 years.
- The CKD subjects were more likely to have periodontitis (more attachment loss and more BoP), fewer teeth, and to be edentulous.
- CKD patients with periodontitis had 9% more chance of all-cause mortality and 6% more chance on CVD-mortality, compared to those without periodontitis (32% vs. 41% and 16% vs. 22% respectively).
- In CKD patients with DM, the increased chance of all-cause mortality was 43%, which was comparable to that of CKD patients with periodontitis.

**Limitations,  
conclusions  
and impact:****Limitations:**

- There is a lack of longitudinal examination of individuals, except for the mortality data.
- Because data of NHANES III were obtained between 1988-1994, the current situation – e.g. medical care, medications – may have changed dramatically. It can be questioned whether the findings are also applicable to today's situation.
- Most other limitations of the study are elaborated in the Discussion.

**Conclusions:**

- The authors conclude that periodontitis in CKD patients is associated with a higher risk of mortality than having CKD without periodontitis.

**Impact:**

- If a causal relationship is established between periodontitis and increased rates of mortality in CKD patients, treatment of periodontitis should be implemented in the healthcare of such patients.