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Reprints available from BAMM Sterenborg, Dept of Dentistry, Radboud Univ Medical Ctr, PO Box 9101, Nijmegen, 6500 HB, The Netherlands; e-mail: Bernadette.Sterenborg@radboudumc.nl

ORAL MEDICINE

Risk for myocardial infarction

BACKGROUND

When patients undergo invasive dental procedures, there is a dissemination of oral bacteria and their products into the bloodstream, which triggers an acute inflammatory response. The bacteremia occurs immediately after treatment but lasts a very short time under normal conditions. It's been suggested that this inflammatory response increases the risk for acute cardiovascular events, such as myocardial infarction (MI). A case-control study was undertaken to evaluate whether invasive dental treatment leads to a transient increased risk for MI.

METHODS

The data were gathered from nationwide health care and population registries in Sweden. The 51,880 case patients (mean age 72.6 years) had a first fatal or nonfatal MI between January 2011 and December 2013. Five control subjects were selected randomly for each case patient. All controls were free of previous MI and matched for age, sex, and geographic area of residence, yielding 246,978 control subjects (mean age 72.3 years). The Dental Health Registry was used to provide information on dental treatments, which were categorized into invasive treatments and others. Some procedures were done 4 weeks before the MI, some 2 weeks, and some 2 days before the MI. The odds ratios (ORs) for MI were estimated for these groups. In addition, confounding factors were evaluated for their effect on MI risk. These included diabetes, previous cardiovascular disease (CVD), CVD drug treatment, education, and income.

RESULTS

Case patients had diabetes and previous CVD and received more CVD drug treatment than control subjects. In addition, control subjects had higher educational and income levels than case patients.

Over the 4 weeks before the MI, the frequency of invasive dental treatments was similar, with the exception of implant surgery, which was done among case patients more often than in control subjects. Case patients were less likely to have dental examinations, temporary treatments, caries treatment, supragingival scaling/prophylaxis, fillings, root canal treatment, and fixed prosthodontics treatments than control subjects over the course of the 4 weeks before their MI. No association was found between invasive dental treatments performed 4 weeks before the MI and the risk of MI, even when the assessment was adjusted for confounding factors.

Over the 2 weeks before the MI event, the frequency of invasive dental treatments and other dental treatments was similar among the case patients and the control subjects. No association was found between invasive dental treatments and the risk of an MI at this time period. Considering confounders did not alter the risk estimate.

When invasive dental treatments were done less than 2 days before the MI event, case patients received these treatments less often than control subjects except for scaling and root planning. Invasive dental treatments performed 2 days before the MI event were associated with a lower risk of MI, which was not altered when confounding factors were considered.

DISCUSSION

Several studies have found that the performance of invasive dental treatments increases the levels of inflammatory markers in the bloodstream. A higher risk of cardiovascular events has been associated with increased inflammatory marker levels. This study in a large group of patients and controls found no relationship between the occurrence of MI and the performance of invasive dental treatments 4 weeks, 2 weeks, or 2 days before the MI occurred. None of the confounding factors had an appreciable effect on the risk for MI after receiving invasive dental treatments.

Clinical Significance

This population-based nationwide study provides high generalizability to populations similar to that of Sweden, where CVD prevention is common and general oral health is good. In these populations, having invasive dental procedures can be viewed as likely to have no impact on the occurrence of an MI within 4 weeks. In addition, confounding factors such as age, sex, income, education, CVD drug treatment, and the presence of diabetes or CVD should also add no increased risk of MI for patients.

Nordendahl E, Kjellström B, Fored CM, et al: Invasive dental treatment and risk for a first myocardial infarction. *J Dent Res* 97:1100-1105, 2018

Reprints available from E Nordendahl, Dept of Dental Medicine, Div of Periodontology, Karolinska Inst, Alfred Nobels Allé 8, 141 04, Huddinge, Sweden; e-mail: Eva.Nordendahl@ki.se

ORAL/SYSTEMIC CONNECTIONS

Aspiration pneumonia in elders

BACKGROUND

Aspiration pneumonia is an important cause of death among hospitalized elderly persons. Both society and individuals would benefit from the ability to reduce the incidence of this geriatric disease, along with others. The early identification of possible risk factors, such as smoking and excessive weight gain, which are associated with community-acquired pneumonia, would allow for preventive efforts to be made before the elderly patient entered a community-living setting. The influence of risk factors on the incidence of aspiration pneumonia in an elderly hospitalized population was investigated.

METHODS

The study population consisted of 1174 elderly patients admitted to the Tottori Municipal Hospital or Naruto Seagull Hospital between 2012 and 2016. A total of 444 were women, and the mean ages were 83.0 years for men and 85.4 years for women. All were in stable condition after receiving acute medical care when they underwent tests of their oral condition, including the stability of the posterior occlusion; presence of aspiration pneumonia; physical status based on body mass index (BMI); and cognitive function using the Clinical Depression Rating (CDR) scale. For 196 very elderly patients, swallowing function was evaluated using video endoscopy because of their significant impairment.

RESULTS

Patients with and without aspiration were compared. Significant differences were shown between the 2 patient groups with respect to age, BMI, and gender. Older patients, those with lower BMIs, and women had a significantly higher incidence of aspiration pneumonia than younger patients, those with higher BMI, and men, respectively.

The risk factors found to be significantly associated with aspiration pneumonia included loss of posterior occlusion, opened lips at all times, and impaired tongue movements. No association was noted for the number of remaining teeth or presence of loose teeth. Presence of cerebrovascular disease or cognitive impairment and the incidence of aspiration pneumonia were also significantly related. The 2 strongest relationships were found between (1) the combination of cerebrovascular disease or cognitive impairment and loss of posterior occlusion and risk of aspiration pneumonia and (2) the combination of cerebrovascular disease, cognitive impairment, and loss of posterior occlusion and the risk of aspiration pneumonia. An elevated risk of aspiration pneumonia was associated with impaired swallowing function.

Patients were divided into groups with or without cognitive impairment to determine if impaired cognition had an adverse effect on the incidence of aspiration pneumonia. Although the 2 groups had many similarities in their risk factors, the odds ratio (OR) of impaired swallowing for aspiration pneumonia was significantly higher for those with cognitive impairment than in those without this problem. A significant relationship was seen between swallowing disorder and opened lips at all times. Loss of posterior occlusion and impaired tongue movements showed no significant association with swallowing disorder.

DISCUSSION

The ability to predict a patient's risk for aspiration pneumonia can significantly affect end-of-life care planning. Older patients are at significantly higher risk for aspiration pneumonia than younger patients. This study also found that patients with aspiration pneumonia were significantly older than those without this problem and had a lower average BMI than those without aspiration pneumonia. Relationships between BMI and the risk of aspiration pneumonia may be easy to evaluate and are possibly useful for planning geriatric patient care.

Clinical Significance

Age, low BMI, oral frailty, and cognitive impairment were identified as significant risk factors for the development of aspiration pneumonia in elderly patients. Dentists can perform visual oral examinations and swallowing tests and collaborate with other care providers to determine the risk of patients having aspiration pneumonia. A multidisciplinary team that includes the family of elderly patients has the best chance at predicting which patients are at higher risk for aspiration pneumonia and instituting care plans to address risk factors even before this problem develops.