1000 person-years for MI, 0.67 for HR, 0.92 for stroke, and 2.0 for all-cause death among the total population.

The incidence rates for cardiovascular events increased nearly linearly in proportion to the number of teeth lost. Higher levels of tooth loss were associated with an increased risk for MI, HR, stroke, and death. Tooth loss was an independent risk factor for cardiovascular events in multivariable analysis.

A graded and independent risk was observed between tooth loss and all cardiovascular outcomes. Persons at highest risk were those having 15 or more missing teeth. The association tended to be stronger as the number of teeth lost increased and persisted after adjusting for other cardiovascular risk factors. A substantial increase in the risk for all cardiovascular outcomes was seen in those having 5 or more teeth missing. However, even missing 1 to 4 teeth was associated with a higher risk for MI, stroke, and death. The highest cardiovascular risk was found for edentulous persons, except for MI. The association between tooth loss and mortality was the strongest. An increase by 1 missing tooth was associated with a 1.0% risk increase for MI, a 1.6% risk increase for HF, a 1.5% risk increase for stroke, and a 2.2% risk increase for death.

Subgroup analyses were also done for sex, presence of periodontitis, hypertension, body mass index (BMI) and dyslipidemia, drinking, diabetes mellitus, smoking, income level, and exercise habits, among other variables. In general, the subgroup analyses yielded the same results, except those focused on age and presence of periodontitis. Thus residual confounding by sex, socioeconomic status, smoking, or comorbidities is unlikely to explain the relationships between tooth loss and cardiovascular outcomes.

DISCUSSION

Consistently strong and dose-dependent relationships were shown between the number of missing teeth and incident MI, HF, ischemic stroke, and mortality after adjusting for age, BMI, other cardiovascular risk factors, and socioeconomic status. The strongest association was seen for mortality, with other relationships, in order, being those with MI, HF, and stroke. An increase of 1 missing tooth was associated with about a 1% increase in MI, a 1.5% increase in HF, a 1.5% increase in stroke, and a 2% increase in mortality. Even a small number of missing teeth carried an increased risk for MI, stroke, and death. Sex, socioeconomic status, smoking and comorbities were unlikely to provide any residual confounding in these relationships.

Clinical Significance

With these data in mind, physicians may be able to help distinguish which of their patients are at higher cardiovascular risk simply by determining the number of missing teeth they have. Number of missing teeth appears to be a very good predictor of incident MI, HF, ischemic stroke, and all-cause death.

Lee HJ, Choi EK, Park JB, et al: Tooth loss predicts myocardial infarction, heart failure, stroke, and death. *J Dent Res* 98:164-170, 2019

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PAIN CONTROL

Articaine versus lidocaine for inferior alveolar nerve block

BACKGROUND

Lidocaine has been considered the 'gold standard' for local anesthetics since 1949. Other alternatives have been developed to permit a faster action with a shorter half-life. Articaine is popular because it produces a more profound anesthesia than lidocaine, achieves anesthesia in a shorter period of time, and has a longer duration of anesthesia. Many studies find articaine to be more efficient than lidocaine. The only downside to the use of articaine involves safety. Articaine has been associated with a risk of damaging the inferior alveolar nerve and causing temporary or permanent paresthesia, but the evidence is not conclusive. A mini systematic review of the literature was done to determine if a 4% articaine solution is more likely than a 2% lidocaine dose to injure the inferior alveolar or lingual nerve when given to produce an inferior alveolar nerve block.

METHODS

The databases consulted were the MEDLINE with Full Text, Dentistry & Oral Sciences Source, and Cochrane Library. Seven studies met the inclusion criteria. One was a double-blind random controlled trial (DBRCT) and 6 were retrospective cohort studies.

RESULTS

The DBRCT and 2 cohort studies found that the risk of nerve damage was not increased with 4% articaine over the use of 2% lidocaine. Four cohort studies determined that caution should be used when using the articaine solution, but found no evidence to explain these results.

DISCUSSION

Further research is needed to gather evidence concerning the safety of the 4% articaine solution for an inferior alveolar nerve block. For the present, caution should be used when considering the use of articaine rather than lidocaine.

Clinical Significance

The use of 4% articaine is becoming more popular based on its shorter onset of anesthesia, more profound degree of anesthesia achieved, and longer duration of anesthesia compared to lidocaine. As more evidence is gathered to support the infiltration anesthesia technique, the incidence of inferior alveolar nerve damage with articaine use may be diminished.

Stirrup P, Crean S: Does articaine, rather than lidocaine, increase the risk of nerve damage when administered for inferior alveolar nerve blocks in patients undergoing local anaesthesia for dental treatment? A mini systematic review of the literature. *Br Dent J* 226:213-223, 2019

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Emergency apical periodontitis pain relief

BACKGROUND

Patients who require endodontic treatment often present with acute pain from a necrotic pulp. The suggested emergency treatments include complete chemo-mechanical disinfection (CMD) of the root canal system and systemic or local antibiotic treatment. Since January 1, 2013, the Swedish general dental insurance plan has ceased reimbursement for CMD of the root canal system in necrotic teeth as an emergency treatment. Only the removal of tissue from the pulp chamber (RNT) is now reimbursed. The efficacy of these 2 emergency treatment procedures to alleviate the pain of localized symptomatic apical periodontitis underwent comparison.

METHODS

The inclusion criteria included spontaneous pain and/or pain on percussion and palpation, nonbleeding pulp in the canal orifice, pain of 4 or greater on a Numeric Rating Scale (NRS), and patient age 18 years or older. Fifty-seven consecutive patients from the Malmö University emergency clinic met the criteria and were diagnosed with symptomatic apical periodontitis with no swelling and/or fever. Each had preoperative pain levels and the intake of analgesics documented. Patients were randomly assigned to CMD or RNT. From 3 to 5 days postoperatively the patients were each contacted by phone to grade their current pain level and report the intake of any analgesics and antibiotics postoperatively.

RESULTS

Patients' average preoperative pain rating in the CMD group was NRS 7.0 but it declined to NRS 1.4 postoperatively. Patients' average preoperative pain rating in the RNT group was NRS 7.4, declining to NRS 2.1 postoperatively. The mean pain relief achieved did not differ statistically. Eighty-seven percent of the patients in the CMD group achieved satisfactory pain relief, compared to 81% of the RNT patients. One patient in each treatment group developed increased pain and local swelling 3 to 5 days postoperatively and was prescribed antibiotics. Patients determined their own use of analgesics, whether opioids or non-opioids.

DISCUSSION

Both CMD and RNT achieved significant pain-relieving effects and reached a level considered clinically acceptable with or without analgesics. Removal of necrotic and infected tissue from the pulp chamber to alleviate dental pain from symptomatic apical periodontitis may offer a cost-effective alternative to complete chemo-mechanical disinfection.

Clinical Significance

Adequate pain relief was obtained with both treatments, although analgesics were required in some cases. Removing the necrotic pulp tissues should be considered an emergency treatment, with follow-up for complete chemo-mechanical disinfection of the root canal system ideally scheduled at the emergency appointment.