http://dx.doi.org/10.17159/2519-0105/2022/v77no10a7

What's new for the clinician– summaries of recently published papers

SADJ November 2022, Vol. 77 No.10 p628- p631

Prof V Yengopal, Dean, Faculty of Dentistry, University of the Western Cape

1. Is there an association between coffee consumption and periodontitis?

Periodontitis is a chronic oral disease characterized by inflammation of the gingiva and/or destruction of the connective tissue and alveolar bone that support the teeth. Subgingival microorganisms that adhere to and grow in the periodontal pocket, along with excessive and aggressive immune response against these microorganisms, are considered to cause periodontitis. Therefore, the primary purpose of periodontal treatment is to control subgingival microorganisms.

In addition to removal of the etiological agent of periodontitis, the control of risk factors of periodontitis is also essential to maintain periodontal health. Several studies have established that factors such as tobacco use, excessive alcohol consumption, diabetes mellitus, dyslipidemia, and environmental and genetic exposure, may be involved in periodontitis. Coffee is one of the most consumed drinks in the world. Also, coffee consumption has been reported to be inversely associated with markers of inflammation and endothelial dysfunction.[1] Struppek and colleagues from Germany (2022) [1] reported on a study that sought to assess the strength of the association between coffee consumption and periodontitis using state-of-the-art, comprehensive phenotyping.

MATERIALS AND METHODS

The Data from this study was derived from The Hamburg City Health Study in Germany. Participants between 45 and 74 years of age from the general population of Hamburg were recruited. Written informed consent was obtained from all participants. Inclusion criteria included a completed periodontal examination and documentation on coffee consumption data. Exclusion criteria included individuals requiring endocarditis prophylaxis.

Coffee consumption was assessed using a previously validated food frequency questionnaire (FFQ) that included cups of coffee consumed per day for the last 12 months, type of coffee (caffeinated or decaffeinated), and additives (no additives, sweetener, milk, evaporated milk, sugar, or honey). Multiple answers were possible for type of coffee and additives. Frequency of coffee consumption was classified as low (0–2 cups/day), moderate (3–6 cups/day), and strong (≥ 7or more cups/day).

Oral and periodontal examination was carried out by trained and calibrated study nurses. The decayed, missing, and filled teeth (DMFT) index was recorded and periodontal examination was done with a PCP-12 probe. Probing depths (PD) and gingival recessions (GR) were recorded in 6 sites (mesio-oral, oral, disto-oral, mesio-buccal, buccal, disto-buccal) for each tooth in millimeters. Clinical attachment loss (CAL) was calculated (CAL = PD + GR). Bleeding on probing (BOP) and Plaque Index (PI) was recorded accordingly. The severity of periodontitis was categorised as none/mild, moderate and severe.

The additional variables, such age, sex, education (based on international standard classification of education), and smoking (non-smoker, former smoker [quit smoking at least 6 month ago], current smoker), were assessed via self-reported questionnaire. In the study centre, the following variables were measured: body mass index (BMI in kg/m2), diabetes mellitus (taking medication of the A10 group (ATC-Code), fasting glucose > 126 mg/dl, non-fasting glucose > 200 mg/dl, positive self-disclosure), coronary artery disease (CAD was defined as suffering from one or more of the following conditions: status post myocardial infarction, percutaneous coronary intervention (PCI) or history of coronary bypass surgery), hypertension (was defined as a systolic blood pressure ≥ 140 mmHg, a diastolic blood pressure ≥ 90 mmHg, or the use of one or more of the following antihypertensive drugs: ACE inhibitors, angiotensin II receptor blockers, beta blockers, calcium channel blockers, renin inhibitors, or loop diuretics), and laboratory parameters (serum high-sensitive IL-6 and high-sensitive CRP).

RESULTS

The overall cohort consisted of 10,000 participants with 48.9% being men with a median age of 63 years. Of the participants, 63.3% of them were low (0–2 cups/

Prof V Yengopal: *BChD, BScHons, MChD, PhD*, Dean, Faculty of Dentistry, University of the Western Cape, South Africa.
ORCID Number: 0000-0003-4284-3367
Email: vyengopal@uwc.ac.za

day), 33.3% moderate (3–6 cups/day), and 3.5% strong (≥7 cups/day) coffee drinkers. The Periodontal cohort consisted of 6,209 participants, presenting either none/mild (n=1,453, 39.6% men, 2.4% strong coffee drinkers), moderate (n=3,580, 49.3% men, 3.3% strong coffee drinkers), or severe (n=1,176, 60.9% men, 5.0% strong coffee drinkers) periodontitis. Participants with severe periodontitis were more often men (60.9%) with median age of 66 years, 4.1% exhibit a lower education, and 25.1% were currently smoking. Furthermore, 11.3% were diabetic and 72.5% suffered from hypertension. Five percent of participants with severe periodontitis drunk ≥7 cups of coffee per day.

Ordinal logistic regression analyses revealed significant association between strong coffee consumption and periodontitis in the unadjusted (OR: 1.52; 95% CI: 1.10, 2.09; p>0.001) and adjusted (age, sex, smoking, diabetes, and hypertension) model (OR: 1.51; CI: 1.07, 2.12; p>0.001) in comparison with low coffee consumption. Conversely, moderate (3–6 cups/day) coffee consumption was neither associated in the unadjusted nor in the fully adjusted model with periodontitis, compared with low coffee consumption.

CONCLUSION

The researchers found that strong but not moderate coffee consumption was significantly associated with periodontitis, compared to participants with low coffee consumption.
Implications of findings: The huge sample size provides good evidence of an association between strong coffee consumption and periodontitis

REFERENCE

1. Struppek J, Walther C, Bunte K, Zyriax BC, Wenzel JP, Senftinger J, Nikorowitsch J, Heydecke G, Seedorf U, Beikler T, Borof K. The association between coffee consumption and periodontitis: a cross-sectional study of a northern German population. Clinical oral investigations. 2022 Mar;26(3):2421-7

CPD questionnaire on page 638

The Continuous Professional Development (CPD) section provides for twenty general questions and five ethics questions. The section provides members with a valuable source of CPD points whilst also achieving the objective of CPD, to assure continuing education. The importance of continuing professional development should not be underestimated, it is a career-long obligation for practicing professionals.

2. Is perioperative antibiotic prophylaxis in the case of routine surgical removal of the third molar still justified?

Surgical removal of the third molar is one of the most common interventions in oral surgery and postoperative complaints occur quite frequently. Many clinicians routinely prescribe antibiotics pre-operatively to reduce the chances of post-op infection although there is no consensus on whether this is the best protocol to adopt.

Worldwide drug misuse and overuse are some of the reasons we are currently facing AMR (antimicrobial resistance)[1]. The declining efficacy of antimicrobial medication has become a reality in the form of superbugs, such as methicillin-resistant staphylococcus aureus or extremely drug-resistant tuberculosis[1]. The World Health Organization (WHO) defined a "Global action plan on antimicrobial resistance" with a focus on five strategic objectives: the improvement of awareness and understanding of antimicrobial resistance (AMR), increase in surveillance and research, decrease in the incidence of infections, pursuit of sustainable financing, and optimization of the application of antimicrobial drugs. Kirnbauer and colleagues (2022) [1] reported on a noninferiority trial of a placebo medication in conventional surgical removal of the noninflamed wisdom teeth, while focusing on surgical site infections (SSIs), swelling, trismus, and the patient's subjective well-being compared with perioperative antibiotic prophylaxis with amoxicillin.

MATERIALS AND METHODS

This study was conducted as a randomized, double-blinded, placebo-controlled single-centre trial in a split-mouth design.

A priori sample size calculation was performed and 110 observations were planned. Unfortunately, there were 9% dropouts; thus, a final number of 50 participants with 100 surgeries was reached. Patients aged 16 years or older who were referred for surgical removal of four impacted or slightly impacted wisdom teeth were considered for inclusion. Inclusion criteria were as follows: four impacted or partially impacted third molars (18, 28, 38, 48) of average degree of difficulty; absence of actual local infection; normal state of health (American Society of Anaesthesiologists classification, ASA 1); non or light smoker (< 10 cigarettes/day); absence of allergies or intolerances to local anaesthetics, amoxicillin, or penicillin; no use of antibiotics within the previous 3 months; a lack of factors negatively influencing soft tissue healing and bone metabolism (e.g., antiresorptive medication, head, and neck radiotherapy); and no pregnancy and breastfeeding in female participants. Patients with general contraindications to wisdom tooth extraction surgery and those who did not meet the above criteria were excluded.

The participants were randomly assigned to their treatment ID and subsequent blinded medication package (two containers each with first event group, EG; second control group, CG; or inverse. A person not involved in the clinical procedure was responsible for strictly keeping the blinded medication packages and the allocation list locked. As a result, the surgeons, patients, and postoperative assessors were blinded.

At the first study visit, general clinical parameters were assessed with a standardized health questionnaire. Patients were checked using panoramic radiography to radiological inclusion criteria of four (partially) impacted third molars of medium degree of difficulty according to the classification of Pell and Gregory and Winter for lower wisdom teeth. A cone-beam computed tomography scan was performed with a close association between the roots and the inferior alveolar nerve canal. Additionally, all patients underwent a radiation-free face scan for digital surface imaging with the same device. Furthermore, assessment of the maximum interincisal distance, as well as an analogue face measurement with a tape measure (lateral corner of the eye–jaw angle; tragus–lateral corner of the mouth, tragus–pogonion, summarized in millimetre, mm), was performed as preoperative baseline values.

An hour before the start of wisdom tooth removal on the day of the first and second surgery, all patients received 40 mg of methylprednisolone orally and their study medication (26 hard gelatin capsules in a resealable container). The study medication was prepared at the local hospital pharmacy using Amoxilan 1000-mg tablets, newly packaged into hard gelatin capsules containing 250 mg amoxicillin each. Eight capsules were taken immediately, and on the following 3 days, six capsules (3 × 2 every 8 h). The EG received 250 mg amoxicillin per capsule (2 g amoxicillin on the day of surgery, 1.5 g amoxicillin on each on the following 3 days), while the CG received capsules filled with pharmacological inactive lactose monohydrate as placebo medication. The hospital pharmacy delivered two containers for each treatment ID with allocation to the first and second intervention that each patient randomly received both the amoxicillin and placebo once in varying order.

Three well-experienced oral surgeons performed the third molar surgery under strict hygiene guidelines in a surgical room, including sterile surgical laundry, sterile gloves, and preoperative facial wash of the patient. Each procedure followed a standardized protocol. First, the upper third molar was removed with elevators after full-thickness mucoperiosteal flap elevation, reflection, and osteotomy. Second, a full-thickness mucoperiosteal envelope flap was built at the lower jaw after incision (blade no. 15) along the ramus with lateral extension from the second molar. Osteotomy and, if necessary, tooth section were performed using a surgical handpiece with descending round burs and a conical mill under continuous sterile cooling liquid.

After surgery, the patients got detailed instructions concerning postoperative behaviour, study medication intake, and daily self-assessment. In the event of an emergency, all patients were given contact information to call for advice 24 h a day, 7 days a week. A minimum interval of 3 months between the first and second surgery was observed to prevent influence by the active ingredient. Patients were reordered on postoperative day 1 (d 1) and day 7 (d 7) for follow-up, including medication compliance, digital face scan, analogue face measurements (swelling:

lateral corner of the eye–jaw angle; tragus–lateral corner of the mouth, tragus–pogonion, summarized in millimetre; trismus: maximum interincisal distance, recorded in millimetre), and intraoral clinical investigation concerning potential SSIs. Surgical site infection (SSI) was defined as local inflammation, indicating solely wound irrigation, or the presence of an abscess, which required antibiotic treatment and incision and drainage with gauze. Alveolar osteitis was not recorded. Postoperative investigations were double-blinded by an experienced and trained staff different from the blinded surgeon.

For the digital analyses of the swelling, face scan datasets imported into the coDiagnostiX software. To measure the volume of swelling, measurements were superimposed using the preoperative and both postoperative (d 1; d 7) scans using stable anatomic landmarks, such as the forehead, bridge, tip of the nose, and both eye sockets. Afterwards, the volume between preoperative and first postoperative (d 1) as well as preoperative and second postoperative (d 7) scans at both sides was segmented manually within the coDiagnostiX software. For the analysis of patient-centred outcomes, the bleeding, swelling, and pain parameters were postoperatively self-assessed from days 0–7 and documented on a 10-cm visual analogue scale (VAS) extending from 0 (no pain) to 10 (very severe pain). Furthermore, the need for additional pain medication was self-documented dichotomously (yes = Y/no = N) until postoperative day 7.

RESULTS

The experimental protocols were implemented as planned, with no modifications. Fifty patients with 100 interventions (split-mouth design: 50 interventions in experimental group (EG), 50 interventions in control group (CG) were included in the final analyses.

With regard to the primary outcome variable, an overall surgical site infection (SSI) rate (local inflammation or abscess) of 11% (n = 11/100 cases) occurred, which means that an inflammatory rate of 6% (n = 3) in the experimental group and 16% (n = 8) in the control group, with no significant difference occurred between the groups ($p = 0.200$). Abscesses with purulent secretion developed in two cases out of 100 observations, one in the EG and one in the CG.

The analogue measurements of swelling reflected an increase on day 1 and a decrease until day 7 in both groups without a significant difference between them ($p = 0.942$; $p = 0.574$), whereas values on day 7 were slightly higher compared with the baseline measurements. Concerning the digital assessment of swelling, neither at the first nor the second postoperative appointment did the face scan evaluation show any significant difference between experimental and control groups ($p = 0.727$; $p = 0.449$). The trismus parameter showed a similar trend with a decrease in the interincisal distance on day 1 and an increase until day 7 without a significant difference between EG and CG ($p = 0.399$; $p = 0.570$)

The three patient-centred outcome variables (bleeding, swelling, and pain) continuously decreased until postoperative day 7. However, a significant difference was observed with bleeding in the EG (day 0: $p = 0.012$) postoperatively. The self-assessment of pain medication intake resulted in no significant difference between the EG and CG at any postoperative time point.

CONCLUSION

This study demonstrated that prophylactic perioperative antibiotic treatment is not preferable to a placebo medicine, based on objective clinical and subjective patient outcome data.

Implications for practice

This trial has shown that preoperative prophylactic antibiosis for routine surgical removal of third molars in clean–contaminated sites, where no sign of local inflammation is present, generally seems unnecessary. To prevent overtreatment of patients and help reduce the worldwide consumption of antimicrobials, dentists should carefully weigh the individual risks and benefits before using antibiotics.

REFERENCE

1. Kirnbauer B, Jakse N, Truschnegg A, Dzidic I, Mukaddam K, Payer M. Is perioperative antibiotic prophylaxis in the case of routine surgical removal of the third molar still justified? A randomized, double-blind, placebo-controlled clinical trial with a split-mouth design. Clinical Oral Investigations. 2022 Oct;26(10):6409-21.