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Metronidazole in periodontal surgical therapy

Submission date
22/11/2020

Recruitment status
No longer recruiting

Registration date
04/12/2020

Overall study status
Completed

Last Edited
27/09/2022

Condition category
Oral Health

[ ] Prospectively registered
[X] Protocol
[ ] Statistical analysis plan
[X] Results
[ ] Individual participant data

Plain English summary of protocol

Background and study aims
Periodontitis, also called gum disease, is a serious gum infection that damages the soft tissue and, without treatment, can destroy the bone that supports your teeth. Periodontitis can cause teeth to loosen or lead to tooth loss.
Some studies have shown that the use of antibiotics can provide some benefits. However, there are no studies that have evaluated how well metronidazole works as an antibiotic in surgical periodontal therapy. Therefore, the objective of our study was to determine whether the use of an antibiotic (metronidazole), as an added treatment to periodontal surgery, provides additional clinical and microbiological benefits, in patients with generalized severe periodontitis.

Who can participate?
Systemically healthy patients of both genders, aged 18 years or older, diagnosed with generalized severe periodontitis.

What does the study involve?
Participants are randomly allocated to receive adjunctive metronidazole or placebo. Clinical variables were recorded at baseline, 6 weeks after subgingival instrumentation, and after 3, 6 and 12 months. Microbiological samples were taken at the initial and final visits and analyzed by multiplex quantitative polymerase chain reaction (qPCR).

What are the possible benefits and risks of participating?
In this study, patients will benefit from non-surgical and surgical periodontal treatment of periodotitis. The treatment is expected to obtain improvements in periodontal clinical parameters such as a decrease in probing depth, gain in the level of clinical attachment, and resolution of inflammation. A greater decrease in bacterias would also be expected in the test group receiving the antibiotics. Although the adverse and unwanted effects associated with the use of systemic antibiotics must be taken into consideration.

Where is the study run from?
Pontificia Universidad Católica Madre y Maestra (Dominican Republic)

When is the study starting and how long is it expected to run for?
April 2014 to May 2019

Who is funding the study?
Pontificia Universidad Católica Madre y Maestra (Dominican Republic)

Who is the main contact?
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Contact information

Type(s)
Scientific

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Study information

Scientific Title
Adjunctive efficacy of systemic metronidazole in the surgical treatment of periodontitis: a randomized placebo-controlled clinical trial

Study objectives
To determine whether the use of a systemic antimicrobial (metronidazole), as an adjunctive treatment to periodontal surgery (step 3), provides additional clinical and microbiological benefits, in patients with severe generalised chronic periodontitis (generalised stages III-IV, grades B-C periodontitis).

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 12/03/2015, Ethical Committee of the Faculty of Health (COBE) of the Pontificia Universidad Católica Madre y Maestra (PUCMM) (Autopista Duarte Km 1 1/2, Santiago, República Dominicana; +1 (809) 580-1962, ext. 4416; brodriguez@pucmm.edu.do), ref: COBE-FACS-EXT-003-1-2014-2015

Primary study design
Interventional

Study design

Randomized parallel placebo-controlled double-blinded clinical trial

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Severe generalised chronic periodontitis (generalised stages III-IV, grades B-C periodontitis)

Interventions
Participants are randomly assigned to treatment groups in ascending order, at the time of surgery, according to a balanced distribution system (random block design, block size = 6).
1. Test group: blisters consisted of 500 mg metronidazole, to be taken three times per day for 7 days after the last surgery
2. Placebo group

In the initial evaluation, a clinical examination is carried out to establish the periodontal diagnosis. Clinical measurements include: PD and gingival recession/overgrowth (REC), measured to the nearest millimeter; CAL, calculated as the sum/rest of PD and REC; bleeding on probing (BOP), assessed dichotomously. Plaque index (PlI) is also assessed. In each quadrant, the most accessible location with the deepest PD and BOP is selected. Subgingival plaque samples are obtained at the same sites throughout the study at the deepest site of each quadrant. All participants receive motivational sessions on oral hygiene instructions and scaling and root planning. Six weeks after the last session of SRP, the re-evaluation is performed and a new full periodontal examination is performed. Those presenting multiple locations with PD ≥5 mm with BOP in ≥1 quadrant received periodontal surgery through open flap debridment. After the last surgical procedure is performed, the medication is provided to the participants, with the instructions to start with the drug regime, three times a day for 7 days. Clinical parameters are recorded 3 months after the last surgery session, and then after 6 and 12 months. Following the active treatment, at 3, 6, 9 and 12 months all patients receive a full mouth professional mechanical plaque removal (PMPR), including SRP as needed and polishing of all dental surfaces present, in both groups.

Intervention Type
Mixed

Primary outcome(s)
Probing Depth (PD), measured using a UNC-15 mm periodontal probe (Hu-Friedy, Leinmen, Germany) at baseline and 12-month visit

Key secondary outcome(s)
At baseline, 3 months after the last surgery session, and then after 6 and 12 months:
1. Probing Depth distribution [/overgrowth (measured to the nearest millimeter), Clinical Attachment Loss (calculated as the sum/rest of PD and REC) and open pockets measured using a UNC-15 mm periodontal probe (Hu-Friedy, Leinmen, Germany)
2. Plaque Index recorded using the O'Leary Index
3. Bleeding on Probing measured using a dichotomous analysis (presence or absence)

4. Microbiological variables (frequency of detection and counts of each targeted bacteria) samples analysed by multiplex quantitative polymerase chain reaction (qPCR), at baseline and after 12 months following surgical therapy

Completion date
15/05/2019

Eligibility

Key inclusion criteria
1. Severe generalized chronic periodontitis (Armitage, 1999), corresponding to generalized stage III-IV periodontitis, with grades B-C (Caton et al., 2018; Papapanou et al., 2018; Tonetti, Greenwell, & Kornman, 2018)
2. A least 10 teeth in function, excluding third molars
3. Sites with PD> 5 mm, in ≥2 teeth in ≥1 quadrant
4. Radiographic evidence of bone loss ≥30% in, at least, 30% of the dentition
5. Older than 18 years

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
All

Total final enrolment
40

Key exclusion criteria
1. Pregnant or breastfeeding women
2. Systemic diseases and/or chronic medications that may affect the periodontal status and /or requiring antibiotic prophylaxis
3. Having received systemic antimicrobial treatment in the previous 3 months
4. Have received periodontal treatment in the 6 months prior to the start of the study
5. Allergic to metronidazole, or to any of the components of their commercial formulations (Metrex 500 mg®, Laboratorio Union SRL, Santo Domingo, República Dominicana)
6. Refuse to sign the informed consent
7. Smokers ≥10 cigarettes/day

Date of first enrolment
10/02/2015

Date of final enrolment
15/02/2018

Locations

Countries of recruitment
Dominican Republic

Study participating centre
Pontificia Universidad Católica Madre y Maestra (PUCMM-CSD)
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Sponsor information

Organisation
Pontificia Universidad Católica Madre y Maestra

Funder(s)

Funder type
University/education

Funder Name
Pontificia Universidad Católica Madre y Maestra

Results and Publications

Individual participant data (IPD) sharing plan
Not provided at registration

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		05/02/2022	14/03/2022	Yes	No
Protocol file	in Spanish		27/09/2022	No	No