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A clinical study to assess the efficacy a new interactive toothbrush in the reduction of gingivitis and dental plaque

Submission date
14/02/2020

Recruitment status
No longer recruiting

Registration date
17/02/2020

Overall study status
Completed

Last Edited
20/08/2021

Condition category
Oral Health

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

Plain English summary of protocol

Background and study aims
Gingivitis represents perhaps the most common disease of the periodontium, with a majority of adolescents and dentate adults affected worldwide. Various factors have been implicated in disease extent or severity. Of these, the microorganisms in dental plaque are recognized as playing a prominent etiological role. In the absence of adequate oral hygiene, supragingival plaque accumulation may be rapid, and visible gingival inflammation manifested within a few days.
Even in extreme plaque accumulation conditions, thorough oral hygiene and mechanical plaque removal is reported to reduce gingivitis and restore health. Control of supragingival plaque is an essential element in effective oral hygiene programs. Oral hygiene devices are under continuous review for efficacy and safety, as new devices or improvements of features on existing devices are developed.
The objective of the study is to evaluate and compare the efficacy of a new interactive experimental electric toothbrush to a marketed interactive sonic toothbrush in the reduction of gingivitis and dental plaque over a 12-week period by using the Modified Gingival Index, the Gingival Bleeding Index and the Rustogi Modification of the Navy Plaque Index.

Who can participate?
Generally healthy adults with evidence of plaque and mild to moderate gingivitis.

What does the study involve?
Participants are randomly assigned to either the Test group (new interactive experimental electrical toothbrush) or the Control group (marketed interactive sonic electrical toothbrush). Participants are instructed to download and install the app for their assigned brush on their mobile device and to use the app when brushing for the duration of the study. Participants used their assigned products with a regular toothpaste twice daily at home for the duration of the study.
Plaque measurements are taken at: Baseline visit (pre- and post-brushing), Week 1, and Week 12 visits (both pre-brushing only). Gingivitis measurements are taken at: Baseline, Week 1, and Week 12 visits. The individual appointments at Baseline, Week 1 and Week 12 are scheduled for

approximately the same daytime for all three visits. Participants are instructed to abstain from any oral hygiene for 12 hours prior to all visits.

What are the possible benefits and risks of participating?
The study is designed to assess if the participants in the Test group will experience an improvement in oral health. Participants used the test products at home in place of their regular toothbrush and toothpaste. Products are returned at the end of the study.
The dentifrice provided in this study is currently marketed. The risk from chemical hazard is negligible, or no greater than what would have been encountered during daily life.
The experimental electrical toothbrush is made from materials used in currently marketed brushes and the Control sonic toothbrush is currently marketed. There are no anticipated risks from the materials used in the experimental toothbrush.
Toothbrushes are not anticipated to cause any serious or long-term effects on oral tissue including gingival recession. This study involved the use of toothbrushes as part of a normal oral hygiene routine. No behavior with incremental risk is requested from participants. In addition, their participation helped in the development of products that aim to improve oral health. There are no notable risks involved with participating.

Where is the study run from?
All Sum Research Ltd. (Canada)

When is the study starting and how long is it expected to run for?
January to July 2020

Who is funding the study?
Procter and Gamble Company (USA)

Who is the main contact?
Dr. Chhaju Ram Goyal, DDS
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Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

Protocol serial number

Study information

Scientific Title
A 12-week clinical study to compare a new interactive power toothbrush to an interactive sonic toothbrush in the reduction of gingivitis and plaque

Study objectives
The objective of the research is to investigate whether 12 weeks use of a new interactive electrical toothbrush will result in better gingival health when compared to a marketed interactive sonic electrical toothbrush (measured for gingivitis using the Modified Gingival Index [MGI] and Gingival Bleeding Index [GBI] and measured for plaque using the Rustogi Modification of the Navy Plaque Index [RMNPI]).

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 30/10/2019, Veritas IRB Inc. (8555 Transcanada Hwy., Suite 201, Montreal, Quebec, H4S 1Z6, Canada; +1 514.337.0442; nhamzeh@veritasirb.com), ref: 16457-10:58:3029-10-2019

Primary study design
Interventional

Study design
Single-center randomized controlled examiner-blind two-treatment parallel study

Study type(s)
Prevention

Health condition(s) or problem(s) studied
Mild to moderate gingivitis

Interventions
Participants are stratified at baseline on tobacco use, mean gingivitis score, number of bleeding sites, and mean plaque index. Within these strata, participants are randomly assigned to either the Test group (new interactive toothbrush) or the Control group (marketed interactive toothbrush).

Participants are instructed to use the study products according to the manufacturer instructions at home twice daily (morning and evening) in place of their normal oral hygiene for the duration of the study (12 weeks).

Gingivitis measurements are taken at: Baseline, Week 1, and Week 12 visits. Plaque measurements are taken at: Baseline visit (pre- and post-brushing), Week 1, and Week 12 visits (both pre-brushing only).

Intervention Type
Device

Phase
Not Applicable

Primary outcome(s)
1. Gingival inflammation and bleeding measured by Modified Gingival Index (MGI) and Gingival Bleeding Index (GBI) at baseline, week 1, and week 12
2. Dental plaque measured by Rustogi Modification of the Navy Plaque Index (RMNPI) at baseline (pre- and post-brushing), week 1, and week 12 (both pre-brushing only)

Key secondary outcome(s)
None

Completion date
24/07/2020

Eligibility

Key inclusion criteria
1. Give written informed consent prior to study participation and be given a signed copy of their informed consent form
2. Be at least 18 years of age and typically use a manual toothbrush
3. Be in good general health as determined by the investigator/designee based on a review /update of their medical history
4. Possess a minimum of 16 natural teeth with facial and lingual scorable surfaces
5. Possess a smartphone which runs Android 7.0 to 10.0, or an iPhone that runs on iOS 11.0 to 13.0 and agree to download a toothbrushing app from the manufacturer of the assigned brush. The mobile device must support Bluetooth 4.2 (or higher)/Bluetooth Smart.
6. Baseline whole mouth mean MGI score of at least 1.75 but not more than 2.5
7. Baseline whole mouth pre-brushing RMNPI score of greater than 0.5
8. Have at least 20 but not more than 90 bleeding sites (sites with a score of 1 or 2 on the GBI index) for Baseline whole mouth mean
9. Agree not to participate in any other oral care study for the duration of this study
10. Agree to not to have any elective dentistry, including dental prophylaxis, until study completion and to report any non-study dentistry received at any time during the course of this study
11. Agree to refrain from using any non-study oral hygiene products for the study duration
12. Agree to return for all their scheduled visits and to follow all study procedures
13. Refrain from brushing their teeth or from performing any other oral hygiene procedure anytime within the 12 hours prior to Baseline Visit and agree to follow these same restrictions prior to all visits
14. Refrain from medicated lozenges, breath mints, eating, drinking*, chewing gum and using tobacco for at least 4 hours prior to this visit and agree to follow these same restrictions prior to all visits. *(Allowed small sips of water up until 45 minutes prior to their appointments.)

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Sex
All

Total final enrolment
110

Key exclusion criteria
1. A condition requiring the need for antibiotic premedication prior to dental procedures
2. Severe periodontal disease, including but not limited to, purulent exudates, generalized mobility, and/or severe recession
3. Teeth that are grossly carious, fully crowned, or extensively restored
4. Active treatment for the following conditions: periodontitis, cancer, or a seizure disorder
5. Report to be nursing or pregnant, or intend to become pregnant any time during the course of this study
6. Taking an antibiotic or using a chlorhexidine mouth rinse any time within the previous 2 weeks
7. Have any of the following: orthodontic appliances, removable partial dentures, peri/oral piercings, a pacemaker or other implanted device
8. Oral/gum surgery within the previous two months
9. Any disease or condition that could possibly interfere with examination/procedures or with the subject's safe completion of this study

Date of first enrolment
20/01/2020

Date of final enrolment
24/01/2020

Locations

Countries of recruitment
Canada

Study participating centre
All Sum Research Center Ltd.
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Sponsor information

Organisation
Procter & Gamble (United States)

ROR
https://ror.org/04dkns738

Funder(s)

Funder type
Industry

Funder Name
Procter and Gamble

Alternative Name(s)
Procter & Gamble, PandG, The Procter & Gamble Company, P and G, Procter & Gamble Company, P&G

Funding Body Type
Government organisation

Funding Body Subtype
For-profit companies (industry)

Location
United States of America

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are not expected to be made available because if the raw data is available but not analyzed appropriately by qualified experts in the area, it may lead to misinterpretation of the results. Study protocol, statistical analysis plan, and other additional documents are not intended to become available online.

IPD sharing plan summary
Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		01/02/2021	20/08/2021	Yes	No