Comparative Evaluation of Antiplaque Efficacy of Coconut Oil Pulling and a Placebo, Among Dental College Students: A Randomized Controlled Trial

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DEN 1200 / D200
March 1. 2020

Summary of the Article

Jithender Nagilla, Suhas Kulkarni, Padma Reddy Madupu et al. conducted a randomized controlled trial evaluating the results of coconut oil pulling compared to a placebo on antiplaque efficacy on dental students. The trial took place at Panineeya Institute of Dental Sciences in Hyderabad, India, which was published in the Journal of Clinical and Diagnostic Research in September 2017. https://www.ncbi.nlm.nih.gov/pubmed/29207824.

This experiment was conducted to examine the antiplaque effects of coconut oil pulling on oral health. The experiment is valuable to developing countries where some populations may have limited access to healthcare and preventive services. The trial consisted of 40 students that either used coconut oil or placebo for seven days. Then, data on the plaque scores were collected on the baseline day, third day and seventh day.

Results from the trial demonstrated that coconut oil pulling was able to reduce plaque scores, therefore it could be used as a home care therapy for developing countries due to its accessibility and cost. However, the authors acknowledged that this trial was only conducted for a short time period. Results showed immediate effects, which was not enough to make claims for the long run.

Article information

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It was published in the Journal of Clinical and Diagnostic Research in September 2017. https://www.ncbi.nlm.nih.gov/pubmed/29207824. doi: 10.7860/JCDR/2017/26656.10563

The authors declared there are no financial or other competing interests.

Study analysis

1. **Type of study**

This study is a randomized controlled trial, double blinded parallel trial that was conducted in Panineeya Institute of Dental Sciences in Hyderabad, India.

2. **Study purpose**

With the increased awareness of oral hygiene, chemotherapeutic agents such as chlorhexidine has been introduced in addition to mechanical tooth cleaning, to treat caries and periodontal diseases. While chlorhexidine is highly effective, it can have

disadvantages such as unpleasant tastes and staining of the teeth. (Nagilla, 2017) It might also be inaccessible to developing countries with some populations that have limited access to healthcare and preventive services. To combat this, the method of oil pulling was experimented for its antiplaque effects. Oil pulling has been a traditional folk remedy that has many claims to benefit the oral cavity, such as strengthening teeth, preventing decay, and helping with oral malodor and dryness of throat and cracked lips. (Nagilla, 2017). Therefore, the purpose of the experiment can help determine whether coconut oil pulling would be helpful in antiplaque activities, which would be beneficial for populations that do not have access to care.

3. Experimental design

The experiment consisted of a sample size of 40 dental college students in the age of 18-22, with a minimum of 20 natural teeth, a minimum baseline plaque score >1 and no history of dental visit in the past three months. They were also ineligible for the experiment if they have soft tissue damage that was due to dental appliances, or dental conditions such as periodontal disease, pain, abscess, and swelling. (Nagilla, 2017) Through randomization, 20 of the students were given Maxcare edible Coconut oil (study group), while the other 20 were given mineral water (control group). A pre-trained and pre-calibrated investigator was used for all the examinations. Another examiner performed the randomization as well as giving out the liquids to the subjects. This was done anonymously, so that both the examiner and subjects did not know what was given.

The subjects were instructed to take 10-15 ml of their given liquid and to swirl and pull the liquid through their teeth for 10 minutes or until their mouth felt full. The subjects were also instructed to not brush nor use mouthwash during the seven day study period. The Turesky-Gilmore-Glickman Modification of the Quigley-Hein Plaque Index was utilized after use of coconut oil pulling method to evaluate plaque score on all the subjects on the baseline day, third day and seventh day. (Nagilla, 2017)

The examiners did analyze their findings statistically using the SPSS version 18.0 Independent sample t-test to calculate the significant difference between the plaque scores of the two groups over the baseline, third and seventh days of data collection. Significant difference between the two groups over the baseline, third and seventh day was also measured with ANOVA with post-hoc Bonferroni test. (Nagilla, 2017).

4. Results

There were 40 students that were randomly selected to take part in this experiment, 20 of the students were placed in the control group, and the other 20 were placed in the study group. Majority of the students were female, that have a mean age

of 20.5±1.72. The control group had a slightly higher mean age when compared to the study group. (Nagilla, 2017)

Plaque score data was collected on the baseline day, third and seventh day in both the study group and control group and then analyzed. With the post-hoc Bonferroni test, there was a decrease in the mean plaque score from the baseline to the third day for the control group. But no difference was observed between the third and seventh day. The significance of the plaque reduction in the control group was 13.79±13.38 on the seventh day.

In comparison, the post-hoc Bonferroni test showed that the study group had a decrease in the mean plaque score from the baseline, third and seventh day. It also yielded a highly significant increase in plaque reduction percentage on the seventh day, 28.87±14.07. The independent sample t-test analyzed the mean plaque score, it was significantly lower in the study group from the baseline 1.64±0.37, to seventh day, 1.16±0.28 when compared to the control group which had 1.74±0.40 to 1.50±0.37 on the seventh day. (Nagilla, 2017) It demonstrated a significant difference ($p<0.001$) only on the seventh day for both groups. (Nagilla, 2017) Therefore, the control group has a higher statistical significant increase in plaque reduction on the seventh day compared to the study group. Coconut oil pulling had an overall 29% greater reduction in plaque over the seven days. (Nagilla, 2017)

5. Conclusions

The results from this experiment has demonstrated that coconut oil pulling was effective in reducing plaque scores when compared to mineral water. These results are beneficial for developing countries because it can be used as a preventive home therapy in addition to brushing to maintain oral hygiene. This experiment was done on a rather small sample, so the researchers recommended studies on a larger number of samples. (Nagilla, 2017) They also recommended varying time periods, because this experiment was a seven-day experiment, an experiment with a longer time period, would be beneficial to observing long term effects. (Nagilla, 2017) These components can give more accurate results to determining the antiplaque control activities and the prevention of dental diseases of coconut oil pulling.

Some limitations that were acknowledged by the researchers were the length and size of this experiment. While the results did show that coconut oil pulling did reduce plaque by 29% by the seventh day, it was noted that it cannot be used to predict the results for long term effects. (Nagilla, 2017) Also, they also noted that this experiment was only done in one institution, so the results should be careful if generalized. (Nagilla, 2017) Last but not least, the researchers stated that a crossover design or a parallel design with wash out period would give more accurate results. (Nagilla, 2017)

6. **Your impression**

I definitely believe this is an important and valuable experiment to oral hygiene, the aspect of disease prevention in community and public health, especially in the vulnerable population. This can be useful as a home preventative if they do not have access to chlorhexidine or oral health care in general. It is accessible and cost efficient. An essential component of evidence- based decision making is patient circumstances, so understanding the background of patients, can allow us to know their priorities and preferences. It also helps when we make recommendations to them.

While this experiment explored the antiplaque effects of coconut oil pulling, I am curious about the other effects that it has on the oral health. I have seen advertisements on coconut oil pulling used to whiten teeth, so I am curious about whether it is able to do so. In addition, this experiment was a relatively short trial, so I would like to know about the long term effects of using coconut oil pulling method, and if there any harmful side effects in the long run. Last but not least, I am curious if it can potentially be a replacement for chlorhexidine.

References

Nagilla, J., Kulkarni, S., Madupu, P. R., Doshi, D., Bandari, S. R., & Srilatha, A. (2017). Comparative Evaluation of Antiplaque Efficacy of Coconut Oil Pulling and a Placebo, Among Dental College Students: A Randomized Controlled Trial. *Journal of clinical and diagnostic research : JCDR*, *11*(9), ZC08–ZC11. https://doi.org/10.7860/JCDR/2017/26656.10563