

UNIVERSITI TEKNOLOGI MARA

**LOCAL DELIVERY OF VIRGIN
COCONUT OIL AS AN ADJUNCT TO
NON-SURGICAL PERIODONTAL
TREATMENT: A RANDOMISED
CLINICAL TRIAL**

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ABSTRACT

Introduction: Eliminating dental biofilm within deep periodontal pockets measuring 5 mm and more poses significant challenges. Therefore, supplementing subgingival instrumentations with localised antimicrobial delivery could aid in the eradication of microbes at the pocket base. **Objectives:** To evaluate the effectiveness of local delivery of virgin coconut oil (VCO) in patients with periodontitis as an adjunct to subgingival instrumentation by comparing the clinical parameters of Probing Pocket Depth (PPD), Clinical Attachment level (CAL), Bleeding on Probing (BOP), Gingival Index (GI) and Plaque Index (PI) between groups with VCO and placebo applications. **Methods:** A total of 32 subjects were selected based on the inclusion criteria and were randomised into the test and control groups. At baseline, all clinical parameters were measured, followed by full mouth subgingival instrumentations after receiving oral hygiene education and instructions. Interventions of either VCO or placebo applications subgingivally were performed after 24 hours of subgingival instrumentations and were repeated for three more consecutive weeks. The measurement of the clinical parameters was repeated at 3, 6 and 9 months intervals with the use of an acrylic stent with markings. **Results:** At baseline, the control and test groups showed no statistically significant differences in all mean parameters. At every review interval, intragroup comparison of mean changes from baseline to every follow-up (at 3, 6 and 9 months) revealed statistically significant reductions in all parameters for both the test and control groups ($p < 0.05$). Meanwhile, the intergroup analysis revealed statistically significant differences in mean changes of PPD at 3 months (2.51 ± 1.24 vs 1.82 ± 1.43), 6 months (2.83 ± 1.20 vs 2.01 ± 1.41) and 9 months (2.72 ± 1.15 vs 2.03 ± 1.36), CAL at 3 months (1.89 ± 1.48 vs 40.89 ± 1.46), 6 months (2.09 ± 1.47 vs 1.16 ± 1.58) and 9 months (2.04 ± 1.42 vs 1.10 ± 1.61) and BOP at 3 months (2.51 ± 1.24 vs 1.82 ± 1.43), 6 months (2.83 ± 1.20 vs 2.01 ± 1.41) and 9 months (2.72 ± 1.15 vs 2.03 ± 1.36) between the test and control group ($p < 0.05$), favouring more reductions in the test group compared to the control group. There were no significant differences in mean changes in GI and PI between the test and control groups at each review visit ($p > 0.05$).

Conclusion: Adjunctive use of VCO resulted in significant reductions in PPD and BOP, with a more significant gain in CAL at 3,6 and 9 months follow up.

Keywords: adjunct; non-surgical periodontal treatment; periodontitis; virgin coconut oil.

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CHAPTER ONE

INTRODUCTIONS

1.1 Research Background

Periodontitis is characterised by the loss of periodontal attachments, which comprise the periodontal ligaments, cementum, alveolar bone and gingiva, caused by host-mediated inflammation in response to dental biofilm (Tonetti et al., 2018). According to the Global Burden of Disease Study 2016, severe periodontitis is the 11th most prevalent condition in the world (Vos et al., 2016), with a reported prevalence ranging from 20% to 50% globally (Sanz et al., 2010). Later in 2019, statistics from the Global Burden of Disease Study showed that 1.1 billion individuals have severe periodontitis globally (Chen et al., 2021). In Malaysia, the latest report of the National Adult Oral Health Survey in 2010 showed that more than 90% of adolescents aged, 15 to 17 years were affected with periodontal disease, with 18.2% presenting with deep periodontal pockets of 6mm and more (Mohd-Dom et al., 2013). This is an alarming finding.

Periodontal disease can range from mild to severe form. In 2017, new periodontal disease classifications emerged, dividing periodontal disease into several categories, including gingivitis and periodontitis (Caton et al., 2018). Gingivitis is a milder form of periodontal disease that involves inflammations of the gingiva without destruction of the periodontal ligament, cementum, or alveolar bone. Meanwhile, periodontitis is a more advanced form of periodontal disease, with destruction of the supporting periodontium, leading to tooth loss if left untreated. Periodontitis was further divided into staging and grading, where staging represents the severity of disease progression and the complexity of the treatment needed, whereas grading represents the rate of disease progression (Papapanou et al., 2018a).

There are many complications associated with the presence of periodontitis, which can range from local to even systemic complications. Local complications arise because of chronic inflammation and local destructions of the supporting periodontium during disease progression. These include the presence of tooth mobility due to the loss of periodontal ligament attachment and bone support, gingival recessions, which occur as a result of apical migration of the gingiva, pain and discomfort that may be caused