Regular home use of dual-light photodynamic therapy as an adjunct to non-surgical periodontal treatment in smokers

10.16.22

Clinical investigation plan (CIP)

Study title:		Pages
Regular home use of dual-light photodynamic therapy as an adjunct to non-surgical periodontal treatment in smokers		
Study code: Thss1	Version FINAL	Date

Revision No.	Change details and rationale	Author/Effective date	Accepted
1. 2.	First version Second version	Tommi Pätilä Dimitra Sakellari Aikaterini-Elisavet Doufexi Chrysoula Vakaki	

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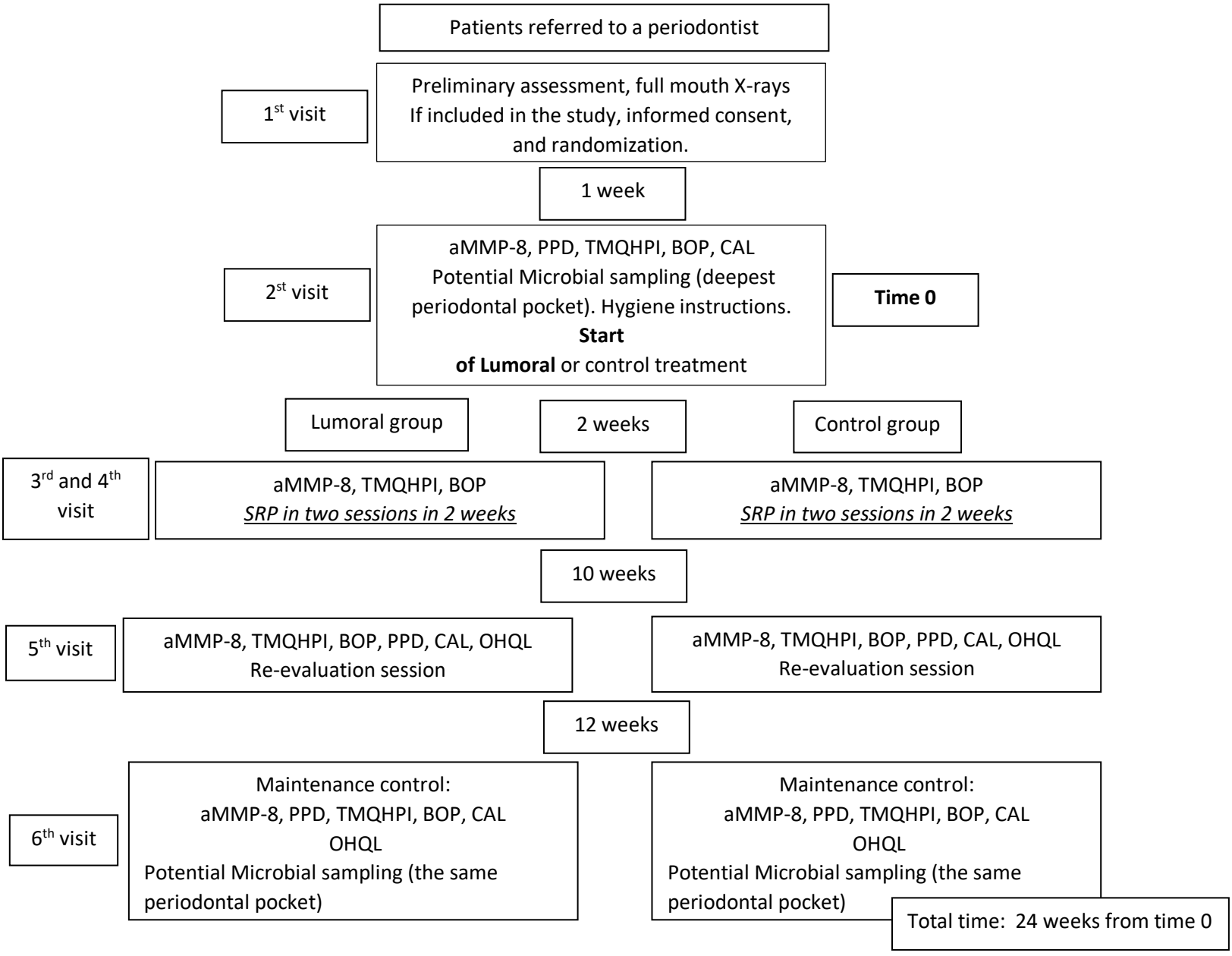
Overall synopsis of the clinical investigation

Study title: Regular home use of dual-light photodynamic therapy as an adjunct to non-surgical periodontal treatment in smokers
Type: Investigator initiated study
Study Center: Department of Preventive Dentistry, Periodontology and Implant Biology, (AUTh) · Aristotle University of Thessaloniki
Name of the Investigational Medical Device (IMD): 1) Lumoral treatment device 2) Lumorinse mouth rinse
Manufacturer of the Investigational Device: Koite Health Oy, Kutojantie 2 C, 02630 Espoo
Study code: Thss1
Investigators and the study center: Principal Investigator: Dimitra Sakellari; Coordinating Investigator: Timo Sorsa; Investigators: Chrysoula Vakaki, Aikaterini- Elisavet Doufexi, Ismo Räisänen, Tommi Pätilä
Study initiation and ending date: 01.09.2022 to 01.09.24
Objectives: To investigate the impact of regular home use of Lumoral device as an adjunct treatment compared to non-surgical periodontitis treatment alone on biofilm removal and host response in Stage III and Grade C smoking periodontitis patients at 3 months.
Methodology: Randomized study; randomization method: www.randomizer.org
Sample size: 60 subjects, 30 subjects in the study group, and 30 in the control group. The subjects have a referral to visit a specialist dentist/ periodontist
Main criteria for inclusion: Periodontal disease Stage III and Grade C with at least 6 sites with probing depth (PD) and clinical attachment loss (CAL) ≥5 mm and bleeding on probing (BOP) ≥15 teeth; aged ≥35; smokers smoking≥10 cigarettes per day, at least 18 years old, presence of ≥20 teeth, agreement to participate in the study and a written consent form signed.
Main criteria for exclusion: Presence of any physical limitation or restriction that might restrict Lumoral use, need for prophylactic antimicrobial coverage; scaling and root planing performed during the previous 6 months; non-smoking status or smoking less than 10 cigarettes per day; antimicrobial therapy in the previous 6 months; immune modifying conditions/ diseases (e.g., diabetes mellitus, rheumatoid arthritis, and osteoporosis); long-term use of medication that could interfere with periodontal response (e.g., bisphosphonates); pregnancy or lactation.

Comparative: None
Estimated duration of the data gathering in the clinical investigation: 6 months
Assessments: **Primary outcome:** Difference in the number of reduced deep pockets (i.e. PD≤ 4mm, no BOP) between the test and the control group. Secondary outcome: PD, CAL, BOP, Turetsky Modified Quigley-Hein Plaque Index (TMQHPI), levels of MMP-8, and Oral Health Quality of Life (OHQL). Need for optional SRP
Statistical methods: Wilcoxon test, Mann-Whitney U-test, Fisher's test, Pearson's correlation test

Study flowchart/ Schedule of visits and study procedures



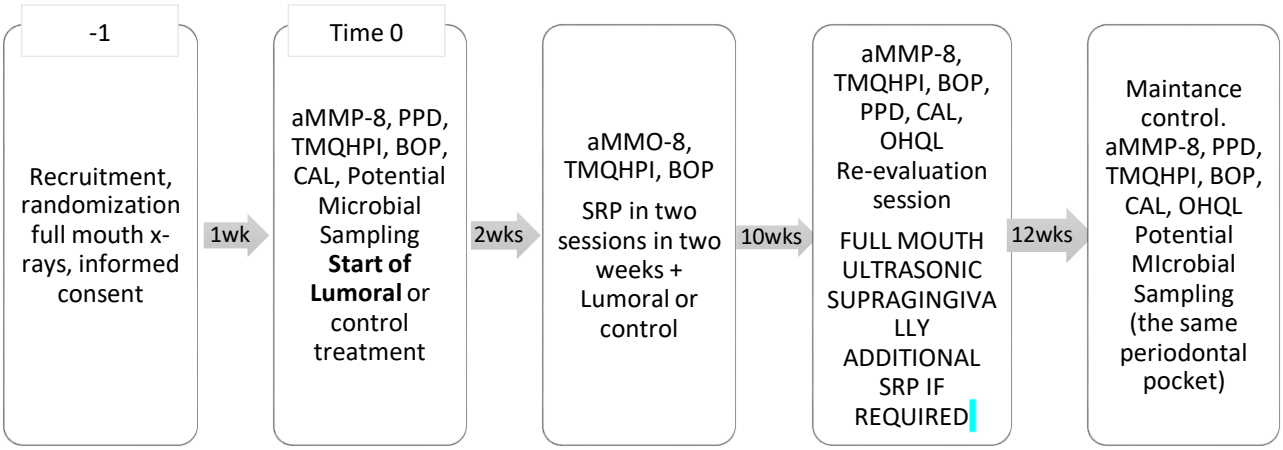
Visit #/code	1	2	3	4	5	X
Reason for visit	**Screening/ Baseline/**	**Start of the intervention**	**2-week follow-up/ SRP in 2 sessions in 2 weeks**	**10 -week follow-up**	**3 month follow-up**	**Termination**
Inclusion/ exclusion criteria	x					
Informed consent	x					
Subject ID	x					
Subject demography	x					
Medications (changes*)	x				x*	
Oral and general disease history (changes*)	x				x*	
Assessments						
aMMP-8 sampling (oral rinse)		x	x	x	x	
Potential Microbial sampling (periodontal pocket)		x		x	x	
Full mouth X-rays	x					
BOP%		x		x	x	
TMQHPI %		x	x	x	x	
PPD		x		x	x	
CAL		x		x	x	
Oral hygiene instructions		x	x	x	x	
Lumoral instructions (only study group)		x	x	x	x	
Lumoral diary for use (only study group)		x	x	x	x	
Reason for termination						x
AE/ADE/SAE/ SADE/DD			x	x	x	x

Power Calculation

Previous results showed statistically significant changes in plaque development in 15 patients in a randomized, split-mouth study (Nikinmaa et al. 2021a). In this clinical study plan, more effective antibacterial therapy shall be used. According to our published laboratory analysis, the dual-light antibacterial treatment would be at least a 3-log scale more potent than the treatment used in the split-mouth protocol (Nikinmaa 2021). In another pilot study in peri-implant patients using this more effective treatment, a significant change in plaque was already observed in the data of seven patients during four weeks of Lumoral treatment (Lähteenmäki et al., 2022).

Based on this limited but promising available data, a power calculation (SAS 9.4, Cary, NC, USA) was performed and levels for 5% alpha error and 20% TYPE II error (80% power) were determined. It was

concluded that the sample size of 25 patients in each study arm was sufficient to allow statistical calculations. 30 + 30 patients were assigned to cover possible dropouts.



Total time: 24 weeks from time 0