**EFFICACY OF OZONIZED WATER AS AN ADJUNCT THERAPY DURING SCALING AND ROOT PLANING IN THE TREATMENT OF PERIODONTITIS AND EFFECT ON HIGH SENSITIVITY C-REACTIVE PROTEIN LEVELS AT THE LAGOS UNIVERSITY TEACHING HOSPITAL.**

**BY**

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**A RESEARCH PROPOSAL FOR DISSERTATION SUBMITTED TO THE NATIONAL POSTGRADUATE MEDICAL COLLEGE OF NIGERIA IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE FELLOWSHIP OF THE COLLEGE IN THE FACULTY OF DENTAL SURGERY (FMCDS)**

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**Chapter Two**

**Aim**

To compare the efficacy of ozonized water with CHX as adjunct therapy during SRP and its effect on clinical and laboratory parameters in periodontitis patients at the Lagos University Teaching Hospital (LUTH).

**Objectives**

1. To determine the effect of subgingival irrigation with ozonized water during SRP on clinical parameters in patients with periodontitis at LUTH.
2. To determine the effect of subgingival irrigation with ozonized water during SRP on laboratory parameters in patients with periodontitis at LUTH.
3. To compare the effect of subgingival irrigation with ozonized water and CHX during SRP on clinical parameters in patients with periodontitis at LUTH.
4. To compare the effect of subgingival irrigation with ozonized water and CHX during SRP on laboratory parameters in patients with periodontitis at LUTH.
5. To determine the correlation between clinical and laboratory parameters of subgingival irrigation during SRP with ozonized water in patients with periodontitis at LUTH.

**Appendix VII:** List of abbreviation

BOP: Bleeding od Probing.

CAL: Clinical Attachment Level.

CHX: Chlorhexidine mouthwash

EDTA: Ethylenediaminetetraacetic acid.

FCγR: FC-gamma Receptor.

GI: Gingival Index.

Hs -CRP: High sensitivity C- reactive protein.

IL: Interleukin

LUTH: Lagos University Teaching Hospital.

MMP: Matrix Metalloproteinases,

NO: Nitric Oxide.

PESA: Periodontal Epithelia Surface Area.

PI: Plaque Index.

PISA: Periodontal inflammatory Surface Area.

PPD: Periodontal Pocket Depth.

ROS: Reactive Oxygen Species

SRP: Subgingival scaling and root planing.

TNF-α: Tumor Necrosis Factor- Alpha

VEGF: Vascular Endothelial Growth Factor

**Data analysis**

Data will be collated and analyzed by using IBM SPSS version 23 (Statistical Package for Social Services, Chicago, IL, USA) Descriptive statistics will be evaluated using mean, standard deviation and proportion as percentages. Shapiro-Wilk tests were computed for each variable to assess whether the variables were normally distributed. Mann Whitney U-Test was used to test the efficacy of the adjunct and determine the significance of differences in both clinical and laboratory parameters between groups. Degrees of association were calculated between the clinical and laboratory parameters using Spearman’s correlation analyses. P values ˂ 0.05 were considered statistically significant for all tests.

**Data analysis Matrix by tools and Questions**

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| --- | --- | --- | --- | --- |
| **Objectives** | **What to examine** | **How it will be examined** | **Tools** | **Expected outcome** |
| 1. To determine the effect of subgingival irrigation with ozonized water on clinical parameters in patient with periodontitis at LUTH. | * Plaque index. * Gingival index. * Probing pocket depth. * Clinical attachment level. * Bleeding on probing. * PISA | Direct measurement by the primary investigator. | Paired T-test will be used to confirm efficacy between baseline and post treatment clinical parameters.  P value set at 0.05 to assess clinical significance | Describe the clinical parameters following a successful SRP, using ozonized water as adjunct. |
| 1. To determine the effect of subgingival irrigation with ozonized water on laboratory parameters in patient with periodontitis at LUTH. | * Hs CRP | * Analysis via venous blood. | Paired T-test to confirm efficacy between baseline and post treatment laboratory parameters.  P value set at 0.05 to assess clinical significance | Describe the laboratory parameters following a successful SRP, using ozonized water as adjunct. |
| 1. To compare the effect of subgingival irrigation with ozonized water and chlorhexidine on clinical parameters in patients with periodontitis at LUTH. | * Plaque index * Gingival index. * Probing pocket depth * Clinical attachment level. * Bleeding on probing. | Direct measurement by the primary investigator. | Unpaired  T-test to determine significance of differences in clinical parameters between the two groups.  P value set at 0.05 to assess clinical significance | Identification of the adjunct group with a better response using clinical parameters following appropriate therapy when both groups are compared. |
| 1. To compare the effect of subgingival irrigation with ozonized water and chlorhexidine on laboratory parameters in the treatment of periodontitis at LUTH. | * Immediate analysis of venous blood for CRP level. | FinecareTM CRP rapid quantitative test based on fluorescence immunoassay technology by using a sandwich immunodetection method. | Unpaired  T-test to determine the significant difference between CRP levels in both groups.  P value set at 0.05 to assess clinical significance | Identification of the adjunct group with a better response using serum CRP, following appropriate therapy when both groups are compared. |
| 1. To determine the correlation between clinical and laboratory parameters using ozonized water during SRP in patients with periodontitis at LUTH. | * Clinical parameters * Laboratory parameters | * Direct measurement by the primary investigator. * Analysis via venous blood. | Pearson *r* correlation test. | Result will range from +1 to -1.  Proximity to +1 indicates a strong correlation, while -1 is indicative of weak correlation. |

**Appendix III: questionnaire.**

**TITLE OF STUDY**

Efficacy of Ozonized Water as an Adjunct therapy during Scaling and Root Planing in the treatment of Periodontitis and effect on High sensitivity C – Reactive Protein (hs-CRP) levels at the Lagos University Teaching Hospital.

I am a resident doctor in the Department of Preventive Dentistry, Lagos University Teaching Hospital (LUTH). I am conducting a study aimed at assessing the efficacy of ozone therapy on periodontitis cases with CRP on patients attending the periodontology clinic at LUTH. I will appreciate if this questionnaire is filled appropriately. Your name is not required and all information provided will be treated with confidentiality. It will be used for educational purposes only.

Thank you.

**Section A: Socio demographic characteristics**

1. Age (at last birthday in years) \_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Gender (a) Male \_\_\_\_\_ (b) Female\_\_\_\_\_
3. Ethnicity (a) Hausa \_\_\_\_\_ (b) Igbo \_\_\_\_\_ (c) Yoruba \_\_\_\_\_ (d) Others \_\_\_\_\_\_
4. Highest level of education (a) Primary \_\_\_\_ (b) secondary \_\_\_\_ (c) Tertiary \_\_\_\_ (d) others (please specify) \_\_\_\_
5. Occupation (please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. Marital status (a) single \_\_\_\_ (b) married \_\_\_\_\_ (c) Divorced \_\_\_\_\_
7. Religion (a) Christian \_\_\_\_\_ (b) Islam \_\_\_\_\_ (c) others (please specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Section B: Oral hygiene practices**

1. How often do you clean your teeth daily?

(a) Every morning\_\_\_\_\_ (b) Anytime\_\_\_\_\_ (c) Morning and last thing at night\_\_\_\_\_ (d) Others (please specify) \_\_\_\_\_

1. Which of the following do you use to clean your teeth daily?

(a) Toothbrush and toothpaste \_\_\_\_ (b) Chewing stick and toothpaste \_\_\_\_ (c) Cotton wool and toothpaste \_\_\_\_ (d) Others Please Specify\_\_\_\_

1. What type of toothbrush do you use?
   1. Soft bristle \_\_\_ (b) Medium bristle \_\_\_ (c) Hard bristle \_\_\_\_ (d) Any bristle \_\_\_\_
2. Have you ever visited the dentist for cleaning of your teeth (a) Yes \_\_\_\_ (b) No \_\_\_\_
3. When last did a dentist help you clean your teeth? (a) Less than 6 months \_\_\_\_ (b) Less than 1 year \_\_\_\_ (c) More than 1 year \_\_\_\_ (d) Never \_\_\_\_
4. How do you clean in-between your teeth? (a) Toothpick \_\_\_\_ (b) broom stick \_\_\_\_ (c) Office pin \_\_\_\_ (d) Dental floss \_\_\_\_ (e) Others Please specify \_\_\_\_

**Section C: Self-perceived need for professional cleaning**

1. Do your teeth look dirty? (a) Yes \_\_\_\_ (b) \_\_\_\_
2. Have you noticed bleeding from your gums recently (say last 3-6 months) while cleaning your teeth? (a) Yes \_\_\_\_ (b) \_\_\_\_
3. Do you feel you have bad breath (a) Yes \_\_\_\_ (b) No \_\_\_\_

**Section D: Symptoms of periodontitis**

1. Does food pack between your gum and teeth while eating (a) Yes \_\_\_\_ (b) No \_\_\_\_
2. Do you think your teeth / tooth is loose? (a) Yes \_\_\_\_ (b) No \_\_\_\_
3. Do you think your teeth / tooth has shifted to another position in your mouth? (a) Yes \_\_\_\_ (b) No \_\_\_\_
4. Do you think there is an increased space in between your teeth? (a) Yes \_\_\_\_ (b) No \_\_\_\_

**Section E examination**

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| **16** | **12** |  | **24** |
| **44** |  | **32** | **36** |

**Plaque index Gingival index**

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| --- | --- | --- | --- |
| **16** | **12** |  | **24** |
| **44** |  | **32** | **36** |