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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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Содержание:

Stepanyan Lusine, Papoyan Varduhi, Galstyan Alina, Sargsyan Diana.
THE PROBLEM OF COMPETENCIES MODELING IN THE SOCIAL-PSYCHOLOGICAL CRISIS CONDITIONS……..……6-12

Biduchak A, Mararash H, Mohammad Wathek O Alsalama, Chornenka Zh, Yasinska E.
ORGANIZATIONAL AND FUNCTIONAL MODEL OF IMPROVEMENT OF THE SYSTEM OF PREVENTION OF CONFLICT SITUATIONS IN THE FIELD OF HEALTHCARE…….....……..13-18

Shalabh Kumar, Sanjay Kumar Yadav, Komal Patel, Renuka Jyothi. R, Bhupendra Kumar, Vikram Patidar.
EARLY IMPLANT OUTCOMES IN ADULTS WITH DENTAL DECAY TREATED WITH PHOTODYNAMIC TREATMENT…..……19-26

M. Zubiashvili, N. Kakauridze, P. Machavariani, T. Zubiashvili.
THE SIGNIFICANCE OF CIRCULATING SURFACTANT PROTEIN D(SP-D) AND DYSLIPIDEMIA IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD), CORONARY HEART DISEASE (CHD) AND THEIR COMBINATION……...……..27-33

Mohamed Hamdi Mohamed Elgawadi, Yasser Abdel Fattah Radwan, Sherif Abdel Latif Othman, Ahmed Samir Barakat, Ahmed Omar Sabry, Abdallu Mohamed Ahmed.
RANDOMIZED COMPARATIVE STUDY OF DEFINITIVE EXTERNAL FIXATION VERSUS ORIF IN PILON FRACTURES: AN EARLY CLINICAL OUTCOME REPORT…….....……34-38

Salome Glonti, Megi Inaishvili, Irina Nakashidze.
EVALUATION OF SOME LABORATORY PARAMETERS IN PATIENTS WITH MORBID OBESITY AFTER BARIATRIC SURGERY…….....……..39-42

Balbeer Singh, Soubhagya Mishra, Rajnish Kumar, Devanshu J. Patel, Malathi.H, Bhupendra Kumar.
IMPLICATION OF THREAT FACTORS AND PREEXISTING DISORDERS IN DIFFERENT ISCHEMIC STROKE SUBGROUPS IN ELDERLY PEOPLE: A SYSTEMATIC STUDY…….....……43-46

Liubov Bilyk, Neonila Korylchuk, Dmytro Maltsev, Mykola Rudenko, Olena Kozeratska.
TRANSFORMATION OF UKRAINIAN HEALTHCARE TO THE NEW CONDITIONS OF DEVELOPMENT: RISKS, SOLUTIONS, MODERNISATIONOPTIONS…….....……47-52

Kozak N.P, Stakhova A.P.
A CASE REPORT OF EOSINOPHILIC GRANULOMATOSIS WITH POLYANGIITIS…….....…….53-56

Amandeep Singh, Pravesh Kumar Sharma, Ashok Kumar Singh, Chhaya Agarwal, Geetika M. Patel, Kavina Ganapathy.
RELEVANCE FOR DIAGNOSIS, THERAPY, AND STRATEGIES OF GUT MICROBES DYSBIOSIS IN CHRONIC KIDNEY DISEASE: A SYSTEMATICREVIEW…….....……57-63

Sharadze D. Z, Abramov A. Yu, Konovalov O.E, Fomina A.V, Generalova Yu.A, Kakabadze E. M, Bokova E. A, Shegai A.V, Kozlova Z.V, Fokina S.A.
MEDICAL AND SOCIAL ASPECTS OF PREVENTING SPORTS INJURIES AMONG CHILDREN AND ADOLESCENTS……...…64-71

Hisham A. Ahmed, Abdulhameed N. Aldabagh, Abdulsattar S. Mahmood.
COMPARISON BETWEEN PRE- AND POST-OPERATIVELY BOTOX INJECTION IN SECONDARY WOUNDS HEALING…..……72-76

Pantus A.V, Rozhko M.M, Paliychuk I.V, Kutsyk R.V, Kovalchuk N.Y.
EFFECTIVENESS OF THE APPLICATION OF THE DEVELOPED BIOPOLYMER FIBROUS MATRIX WITH CENOBONE® BIOGEL FOR THE RECONSTRUCTION OF BONE TISSUE DEFECTS OF THE JAWS……77-84

Sherif W. Mansour, Nesrin R. Mwafi, Nafe' M. AL-Tawarah, Bayan Masoud, Hamzah A. Abu-Tapanjeh, Ibraheem M. Alkhawaldeh, Mohammad S. Qawaqzeh, Raghad Amro, Sulieman B. Mazahreh.
PREVALENCE OF LEFT/RIGHT CONFUSION AMONG MEDICAL STUDENTS IN MUTAH UNIVERSITY- JORDAN…....……85-89

Sadhanandham S, Preetam K, Sriram V, B Vinod Kumar, Pulkit M, TR Muralidharan.
SEVERITY OF MITRAL REGURGITATION AND ITS ASSOCIATION WITH LEFT VENTRICULAR DYSFUNCTION AND BRAIN-NATRIURETIC PEPTIDE LEVELS IN PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE…….....……90-93

Ahmed J. Ibrahim, Niam Riyadh.
EVALUATION OF MIDPALATAL SUTURE MATURATION IN THREE AGE GROUPS IN 10-25 YEARS USING CONE-BEAM COMPUTEDTOMOGRAPHY….....……94-100

Mohammed J. Mohammed, Entedhar R. Sarhat, Mossa M. Marbut.
HEPCIDIN AND IRON BIOMARKERS MODULATED IN HEMODIALYSIS PATIENTS…….....……101-105

Hussein A. Ibrahim, Ammar L. Hussein.
ESTIMATION OF VON WILLEBRAND FACTOR IN PATIENTS CARDIAC DISEASES…….....……106-110

Mohammed L. Abdulateef, Nihad N. Hilal, Mohammed M. Abdul-Aziz.
EVALUATION OF VITAMIN D SERUM LEVELS AND THYROID FUNCTION TEST IN HYPOTHYROIDISM IRAQI PATIENTS…….....……..111-113

Mohammed N. Mahmmod, Entedhar R. Sarhat.
HEPCIDIN AND FERRITIN MODULATED IN OBESE MALE……114-118

Nato Gorgadze, Manana Giorgobiani, Jumber Ungiadze, Vera Baziari, Leila Axvlediani.
EFFECTS OF MATERNAL BLOOD LEAD IN THE PRENATAL PERIOD ON NEWBORNS AND THE SPECIFICS OF THE CONDITION ATBIRTH……119-123

Harith S. Aziz, Ammar L. Hussein, Mohamed G. Zakari.
MYELOPEROXIDASE AND COENZYME Q10 MODULATED IN THE CHRONIC KIDNEY DISEASE PATIENTS…..……124-128

Arnab Sain, Shilpi Awasthi, Oluwafunmilola UKOH (Adeyemi), Kanishka Wattage, Ahmed Elkilany, Adhish Avasthi.
SAFE USE OF FLUOROSCOPY AND PERSONAL PROTECTION EQUIPMENT IN TRAUMA & ORTHOPAEDICS……129-132

Azzam A. Ahmed.
SUTURED VERSUS SUTURELESS CONJUNCTIVAL AUTOGRAFT FOR PRIMARY PTERYGIUM…….…133-136

Osmolian V, Avsievich Al, Parandiy Va, Okhman Ol, Loginova N.
FORENSIC AND LEGAL SIGNIFICANCE OF HYPNOSIS DURING A CRIMINAL INVESTIGATION….….137-146

Loqman J. Tawfiq, Ali K. Durib, Esraa S. Jameel.
CONCENTRATION OF MALONDIALDEHYDE IN WIVES INFECTED WITH TOXOPLASMA GONDII WHICH CORRELATES WITH INTRAUTERINE INSEMINATION IN BAGHDAD'S POPULATION COUPLES……147-151

Georgi Tchernev, Naydekova N.
MELANOMA AND DYSPLASTIC NEVI DEVELOPMENT AFTER RANITIDINE/RILMENIDINE/MOXONIDINE, LERCANIDIPINE, ROSUVASTATIN AND VERAPAMIL/TRANDOLAPRIL- NEW DATA/CASE SERIES. THE POTENTIAL ROLE OF NITROSAMINE/ NDSRIS CONTAMINATION IN POLYMEDICATION AS SUBSTANTIAL SKIN CANCER TRIGGERING FACTOR……152-158

Qutaiba A. Qasim.
HEPARIN-INDUCED THROMBOCYTOPENIA (HIT) SYNDROME AMONG HEMODIALYSIS PATIENTS AND DISEASE MANAGEMENTSTRATEGY……159-170

Oleg Batiuk, Iryna Hora, Valeriy Kolesnyk, Inna Popovich, Antonina Matsola.
MEDICAL AND FORENSIC IDENTIFICATION OF PERSONS WHO HAVE BECOME VICTIMS OF WAR CRIMES OF THE RUSSIAN WAR AGAINST UKRAINE……171-179

F. Kh. Umarov, Ju.D. Urazbaev.
PATIENT-RELATED FACTORS AFFECTING THE RISK OF COMPLICATIONS AFTER PRIMARY TOTAL HIP ARTHROPLASTY……180-186

Arnab Sain, Ahmed Elkilany, Arsany Metry, Marina Likos-Corbett, Emily Prendergast, Kanishka Wattage, Adhish Avasthi.
OCCUPATIONAL HAZARDS IN ORTHOPAEDIC PROCEDURES-A NARRATIVE REVIEW OF CURRENT LITERATURE…..…187-190

Dhanya R.S, Pushpanjali K.
IMPACT OF CULTURAL FACTORS ON THE DENTAL HEALTH STATUS AND BEHAVIOUR OF FEMALES IN THEIR GESTATION PERIOD……191-195

Georgi Tchernev.
MULTIPLE KERATINOCYTIC CANCERS AFTER ENALAPRIL/LOSARTAN INTAKE: POTENTIAL LINKS TO DRUG MEDIATED NITROSOGENESIS/ CARCINOGENESIS: MELOLABIAL ADVANCED FLAP AND UNDERMINING SURGERY AS OPTIMAL THERAPEUTIC APPROACH…….196-199

Subhrajeet Chakraborty, Ankur Khandelwal, Rashmi Agarwalla, Limalemla Jamir, Himashree Bhattacharyya.
ARTIFICIAL INTELLIGENCE: CREATING NEW PARADIGMS IN THE MANAGEMENT OF NON-COMMUNICABLE DISEASES……200-202

VILCAPOMA URETA LIZVE, AYALA GUEVARA KAREN JANET, JUNCHAYA YLLESCAS VILMA AMPARO, PARIAJULCA FERNANDEZ ISRAEL ROBERT.
COMPARISON OF THE EFFICACY OF TRAMADOL AND DICLOFENAC IN RELIEVING POSTOPERATIVE PAIN OF LAPAROSCOPIC CHOLECYSTECTOMY…….203-206

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EARLY IMPLANT OUTCOMES IN ADULTS WITH DENTAL DECAY TREATED WITH PHOTODYNAMIC TREATMENT

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Abstract.

Background: A fast implant is a kind of implant to place in the cavity right away after dental extraction. These implants are shown to maintain cervical marrow and reduce the number of surgery operations required for patients. The Photodynamic treatment (PDT) uses antimicrobial processes to supplement nonsurgical periodontal therapy. Combined through the scaling and root planning (SRP), and PDT is more effective. This study aims to assess the effects of PDT on initial findings with dental implants (DI) placed in patients having gum disease with SRP against patients who do not at the 12-month follow-up point.

Methods: An aggregate of 25 implants were inserted in 16 patients, 12 of whom were in the test group (TG) and 13 of whom were in the control group (CG). SRP is conducted toward rapid implant assignment in the control site, while PDT as an adjunct to SRP (SRP + PDT) is executed prior to instant implant insertion in test sites. At the beginning, 4 months, 8 months, and 12 months, gingival index, radiovisiographs, inquiring pocket intensity, clinical attachment level, and plaque index were obtained. Basic durability was assessed after implant insertion, and the recovery index was measured a week later. In this analysis, Analysis of Variance (ANOVA) technique is used to predict tooth decay earlier.

Results: The CG experienced 1.10 mm of mean marginal bone loss after the 12-month research period, compared to 0.97 mm for the (SRP + PDT) group. After reaching the CG and TG, the differences in plaque score and probe depth were noteworthy. Clinical indicators compared to the basis in a year revealed unquestionable improvement, including the probing depth gingival index, plaque index and clinical attachment level. Twelve months were spent monitoring the implants in both groups. The little bone loss improved, although it isn't clinically important. The endurance rate for rapid implants in the PDT grouping is the same as that of the group that underwent SRP.

Conclusion: The impact of PTD is utilized as a supplement to SRP. Yet, the consequence is marginal. Because of the improved results with PDT, it is used successfully as an addition to SRP.

Key words. Tooth, photodynamic treatment, scaling and root planning, rapid implant, and statistical analysis.

Introduction.

The Dental decay (DD) is the term used to describe the destruction of tooth enamel. It is caused by acid from oral bacteria that dissolves tooth enamel. Defects in teeth known as DD, represent the result of tooth deterioration. DD leads to pain, infection and even tooth loss without being treated.

In the last 30 years, oral health issues have continued to be a serious public health challenge, putting a financial and social burden on society. Regarding socioeconomic differences, untreated DD is the most common problem [1].

Medication is used in Photodynamic treatment (PDT), an automated two-step process that activates optical, followed by utilizing it to kill diseased and precancerous cells. A certain wavelength of light radiation, often from a laser, activates photosensitizers (PS). A variety of malignancies have been carefully studied using the alternative therapy strategy known as PDT. To use this method, a patient must be given a PS medication that is light-sensitive but not poisonous. The visible therapeutic range for PDT has a broad wavelength range of 600 to 800 nm, and after targeted uptake into confined tumor cells, it is able to be activated with light depict on Figure 1 [2].

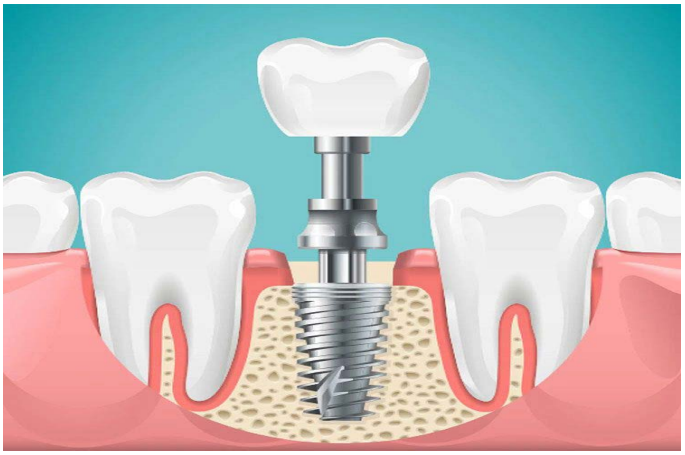

Figure 1. *Photodynamic therapy. (Source link: https://parthadental.com/dental-implants-clinic-hyderabad-bangalore/)*

Dental healthcare providers have access to various unique treatment methods due to the tremendous rise in scientific and technological breakthroughs over the past century. A recent advancement is the application of PDT, developed non-invasive therapy technique that eliminates undesirable cell types or pathogenic microorganisms by using chemical agents

in the form of endogenous molecular oxygen [3]. As someone develops periodontitis, a more complex procedure called the SRP occurs. Mechanically eliminating plaque and calculus down to the roots of the affected teeth is the most effective first treatment for periodontitis. The foundation of periodontal care, based on the cause-related treatment method, which is a SRP. The primary objective is to eliminate both flexible and inflexible microbial build-up from the exposed roots surfaces. In an ideal world, periodontal treatment involves reducing or eliminating the pathogenic microorganisms that cause and sustain periodontal diseases [4].

The scaling and root planning (SRP) is considered into every foundational component about periodontal therapy. The fundamental objective of this process is to eradicate soft and hardened microbial populations among the pathologically accessible surfaces of roots.

As a component of periodontal therapy, the number of pathogenic organisms that contribute to maintain the periodontal diseases must be decreased or eradicated. Therefore, while SRP produces an outstanding clinical result in instances of mild to moderate severity, periodontitis, with periodontal pockets over 5 mm in depth, as well as the involvement of concavities, grooves, and furcation is likely to impact the efficacy of deposit removal [5].

The gradual loss of the bone that supports the gums and teeth is a characteristic of the inflammatory, multifactorial illness known as periodontitis. Periodontal breakdown is emerging from a dysbiosis in the polymicrobial subgingival biofilm that is able to disrupt hemostasis in the periodontal tissues and trigger locally damaging host-related processes. The purpose of PS is to absorb laser light at a certain wavelength and convert it to usable energy [6].

To replace missing teeth and enhance the quality of life for persons with certain therapeutic requirements, DI is a cornerstone in oral rehabilitation. The DI has proven to have a long-term functional survival rate. Success is not same as long-term survival due to issues, even though it is clinically respectable. For long-lasting performance, DI must be maintained by the individual patient, including medical aid [7].

Objective of the study.

The goal of this study is to assess, after a year of monitoring, the effects of PDT throughout the initial stages that the results of DI located in patients with gum disease through SRP in addition those who are affected. In this study, the ANOVA approach is employed to make an early prediction regarding the DD.

Contributions.

• The impact about the PDT regarding to preliminary results of DI built-in patients through gum disease through SRP compared to those who do not monitoring after a year.

• To investigate, the ANOVA method is used to provide a accurate forecast about the onset of DD.

• The effects of PDT are added on top of SRP to increase their effectiveness. Due to the enhanced outcomes achieved with PDT, it is possible to use as an adjunct to SRP effectively.

The study [8] evaluated the effectiveness of PDT and tongue scraping in treating halitosis in elderly full denture wearers. After treatment, the PDT group had a lower mean H2S gas concentration than the tongue-scraping group. Only PDT therapy was able to reduce halitosis to undetectable levels, although both therapies were successful in lowering the concentration of H2S. The paper [9] assessed the effectiveness of antimicrobial PDT in support of managing a sense in older people wearing dentures. Two groups of elderly patients with halitosis wearing the complete dentures were created, those receiving therapy with a tongue scraper and full mouth cleaning and those receiving treatment through a single application of PDT along with the full mouth cleaning and tongue scraping. In elderly individuals wearing dentures, antimicrobial PDT reduced H2S concentrations and improved the quality of life. The study [10] determined the extent to PDT reduced Streptococcus mutans and the way that affected the restorations were carried out. Both molars had the selective excision of carious tissue; one was repaired, while the other underwent PDT therapy on the damaged dentin using a low-intensity laser combined with 0.005% methylene blue PS preceding restoration. After selective caries removal, PDT was utilized as a supplementary therapy against cariogenic bacteria without harming composite resin restorations. The paper [11] determined the best erythrosine-based PDT bactericidal incubation and radiation periods for in biological films that were generated in vivo from dental plaque. A human enamel slab and intraoral appliance randomized controlled experiment with 18 healthy people to collect a few pieces of dental plaque over 2 divides, then two week intervals for use in arms 1 and 2. It appears promising and successfully eliminates in vivo-formed dental plaque biofilms using PDT by shortening the total treatment time. The study [12] used PDT in conjunction with periodontal therapy to cure oral halitosis in healthy persons and to monitor them for three months after treatment. By analyzing volatile sulfur compounds with gas chromatography, halitosis was being assessed. A second evaluation and a microbiological investigation to identify the bacteria are carried out in subsequent therapies. This protocol will assess that phototherapy is useful in halitosis treatment for adults. The paper [13] assessed the effectiveness of PDT meditation through fotoenticine (FTC) on dental caries microcosm biofilms. In vitro, biofilms were created using samples of degraded dentin from several individuals. Colony-forming units (log10 CFU) were counted in nonselective and selective culture mediums after biofilms had been treated with FTC and LED irradiation. The study [14] examined the realms of PDT application have extended with the introduction of endoscopic and fiber-optic technology. PDT was possible to use the oropharynx and oral cavity foci. Because extensive surface defects were treated with little consequences in the early stage of oral mucosal carcinoma, these stages were ideal for PDT. The paper [15] assessed the effectiveness of PDT in lowering streptococcus mutans levels concerning the affected complete restorations. The restoration was performed on one of the molars after selective excision of carious tissue was performed on the molars. The study [16] intended to include a comprehensive understanding of the features therapy for a broad variety of oral illnesses as well as an investigation into the potential applications of PDT treatments utilizing nanomedicine for the treatment of a number of prevalent oral ailments. Also presented were the issues and potential fixes for PDT mediated by nanomaterials. The paper [17] examined

the decrease in bacterial load in primary teeth after standard endodontic treatments. The study [18] assessed through in vitro testing the efficacy of a PDT beside metronidazole-resistant clinical subgingival plaques. The aPDT was mediated by methylene blue, chlorin-e6, and curcumin. The agar dilution technique evaluated the samples' metronidazole sensitivity profile. The paper [19] established the characteristics of aPDT and conducted an analysis of the scientific literature on its impact on cariogenic bacteria organized in biofilms and cavities lesions. A clinical recommendation for the use of aPDT was not supported by enough scientific data, even though it serves as an effective and less intrusive supplementary technique to disinfect deep caries lesions. The study [20] evaluated the PDT efficacy in treating oral premalignant and malignant lesions. In treating premalignant and cancerous growths in the oral cavity's soft tissues, topical PDT appears to be an effective treatment strategy with a high rate of successful outcomes. Yet, additional studies were required to take into the current experience gained from using this program. The paper [21] determined the effectiveness of Photo biomodulation therapy (PBM-T), either unaccompanied or in combination with PBM-T, for treating oral mucositis (OM) in cancer patients.OM is treated with PBM-T unaccompanied or in conjunction with PBM-T. Particularly, PDT + PBM-T enhanced OM healing, cutting the duration of abrasionreduction from 15 to 11 days. The study [22] increased the success rate of PDT in treating childhood dental caries. PDT completely killed streptococci that cause cavities after a 60-second laser exposure, and after a 30-second exposure, the frequency of isolated strains dropped by many orders of magnitude. The paper [23] examined that in PDT, non-toxic PS, such as synthetic dyes, tetrapyrroles, and chemical compounds that occur naturally, were subjected toward a certain dimension of illumination wavelengths to form reactive oxygen species. These species had a deadly impact on the bacterium, particularly by rupturing the biofilm. The study [24] investigated the potential for matrix metalloproteinases (MMPs) connected to oral cancer to be downregulated by PDT with MB. The study [25] demonstrated that PDT with Methylene Blue (MB) decreases matrix metalloproteinases (MMP) that are necessary for the progression of oral cancer into metastases and for its invasion. According to these findings, MB PDT has the potential to be a therapy for oral leukoplakia and cancer that is not only clinically meaningful but also financially viable. The paper [26] provided a general perspective of the way PDT was used in preclinical through vivo investigations using an animal model. Investigations use control or hamster cheek pouch models to assess tumor growth suppression after treatments with different PS. The study evaluated the influence of aPDT on Streptococcus mutans, common caries-causing microorganisms, through the plaque disclosing solutions while a PS dye to a location that was difficult to remove manually. This allowed the researchers to study the consequences of aPDT on Streptococcus mutans.

Process of this study.

Dental Implant.

The DI is artificial that tooth replacements surgically placed into a person's jaw to restore the capacity to chew or its appearance. Crowns, bridges, and dentures are examples of artificial teeth supported by these DI. Three major forms of DIare able to select among the subperiosteal, Endosteal, and zygomatic. Endosteal is the safest and most frequent, followed by subperiosteal, and finally, zygomatic is becoming the last and most difficult. Utilizing the implants inserted is a surgical operation even though the implant technique is considered relatively safe. There are hazards associated with surgery, like any medical procedure. Although there is a genuine risk of infection or rejection, there are very few people experiencing complications after implant surgery.

Adults with DD.

The DD and cavities are the most prevalent health issues worldwide. People in their early teens and later years, as well as reach a greater risk of contracting infections. Holes have the potential to develop in the teeth of everyone have a permanent tooth from newborns to adults. In the event of ignoring cavities, enlarge and damage the deeper dental layers. The accessible root surfaces of older individual’s teeth are susceptible to decay as many of the teeth have receding gums, making it possible for oral bacteria that cause pollution to touch the tooth's root. Adults with DD get discomfort, sensitivity in their teeth, or even obvious holes in their teeth. To prevent and treat cavities, individuals must prioritize frequent dental checkups, follow a strict oral hygiene regimen, and adopt dietary decisions that promote healthy teeth.

Selection of Patients.

A total of 16 patients was implant surgery with 12 patients participating in the TG and 13 patients serving as the CG. The total number of implants placed was 25. Adult patients with aggressive cases of periodontitis, teeth with insufficient bone for maximum of two millimeters after removal, sites with skeletal fractures and disintegration, smokers, the existence of any indications of an active illness, teeth with close roots that have a similar structural composition, and any systemic conditions like osteoporosis and uncontrolled diabetes mellitus were all excluded.

Method of Treatment.

In a medical investigation, 25 implants were implanted in 16 patients. The test group (TG) included 12 patients who received a particular operation or treatment, whereas the control group (CG) included the remained 13 patients who received routine therapy or a control group. Implants are usually devices or substances that are inserted into the bodies for therapeutic intentions. This investigation method provides for a comparison of the test and control groups, which aids in evaluating the efficacy and possible impact of the intervention under consideration.

In a CG participants had extensive SRP with both manual and ultrasonic tools. Indigo cyanine green, a photosensitive dye, was applied to the gingival sulcus of a TG for one minute before being washed away. The 1 mg/mL Emun Do solution was made per the manufacturer's instructions and kept out of the light. The laser beam was directed mesiodistally while apicocoronally in the pockets for 1 minute to photo-activate the solution, and the pockets were completely washed. Patients were given

personalized to maintain good dental health instructions and sent in addition to the expectation of reporting were to come back after four weeks. Baseline measurements were taken of essential parameters such as gingival index (GI), probing depth (PD), plaque index (PI) and clinical attachment level (CAL), before the start of the clinical study. The implant was secured with a hand tool, the torque was determined, and the device was removed after the target value became apparent. The height of the implant was identical to that of the bordering bone. In the initial postoperative period, the beat was closed using simple interrupted sutures, and a pack of frost was applied externally to the operated area for three to five hours.

Medical Intervention.

The intended surgical location was mapped out using a radiovisiograph (RVG) before the procedure began depicts on figure 2. Infected granulation tissue was curetted from the extraction socket, and the area was irrigated with povidone-iodine. A graded UNC-15 probe acquired the socket dimensions that assisted implant sizing. At the beginning of the process, the base of the extraction socket was perforated with a large precision drill to function as a guide for future drilling operations. The use of Lance Pilot Drills continued a diameter of 3.2 millimeters was achieved via consecutive drilling. Drills were utilized between 800 and 1200 rpm while properly cooled. As an implant is inserted into a used extraction site, its main stability is enhanced by an osteotomy. After surgery, patients were instructed to take amoxicillin 500 mg, serratiopeptidase, and diclofenac potassium for seven days. Additionally, twice daily use of a chlorhexidine oral wash 0.2% for three weeks was recommended. Radiographic and medical information were collected at the beginning of this study.

Figure 2. *Radiovisiograph of test site baseline. (Source link: https://www.researchgate.net/figure/Baseline-radiovisiograph-RVG-of-the-right-mandibular-first-molar-region-vertical-bony_fig2_318481969).*

ANOVA test.

The ANOVA is a statistical method for comparing the means of three or more groups. The difference between a one way and a two-way analysis of variance is the number of independent variables are used. The effects of a CG and a TG on marginal bone loss at several time points were studied in a clinical investigation comprising 16 patients that expected 25 DI. The average marginal bone loss in the CG of 13 patients was 1.10 mm during the year-long study. In contrast, the TG that consisted of 12 patients exhibited some reduced average bone loss of 0.97 mm at the same time point. This analytical method determines that the TG marginal bone loss is statistically different from the CG and whether the timing of the examinations at 4, 8, and 12 months affects these differences. The ANOVA reveals that the test therapy reduces bone loss in DI patients. ANOVA provides appropriate for evaluating values between several groups, allowing investigators to determine whether differences in consequences are technically essential, assisting in the assessment of the performance of photodynamic treatment in dental decay instances with various experimental groups.

Results.

There were 25 implants inserted into 16 patients in ultimately. The test group (TG) consisted of 8 participants who received a total of 12 implants following non-surgical periodontal therapy (NSPT) in the form of scaling and root planing (SRP) with concomitant photodynamic therapy (PDT). The control group (CG) consisted of 6 participants who received a maximum of 13 implants after SRP.

Comparison of Sexes and Years:

In this investigation, a total of 16 patients were chosen, with an average age of 48.20 months in the TG and 46 years in the control group. The participants were distributed across different age groups as follows: 48.82% were aged 41-50 years, 26.1% were aged 51-60 years, 20.73% were aged 31-40 years, and 4.35% were aged 21-30 years. In terms of the sexual composition of the individuals, 64.4% of the TG consisted of males, while 37.8% were females. In the control group, 49% were mens and 51% were womens.

Medical assessment findings:

The medical characteristics of the TG are compared within the group and presented in Table 1. The ANOVA was conducted to evaluate “Plaque index score (LN)”, “Gingival index score (IN)”, “Pocket depth (OE)”, “Clinical attachment loss (LTO)”, and “marginal bone loss (AOO)” in the TG, “Independent t test (NP (T))”. The results of the numerous measures, together with Bonferroni's post hoc test, are provided in Table 2. Table 3 displays the comparison of clinical parameters within the CG. The Table 4 presents the ANOVA measures that were repeated, followed by Bonferroni's post hoc test for LN, IN, OE, LTO, and AOO, specifically for the control group.

Table 5 presents the intergroup variance in the average LN, IN, OE, LTO, and AOO in the test and control groups at baseline, 4 months, 8 months, and 12 months follow-up.

The average drop in penetrating intensity is explained in Figure 1. The average LTO and AOO (comparing across and within groups) are presented in Designs 2 and 3, correspondingly. Table 6 displays the intergroup comparisons of the average primary durability indices of the implantation for between the test and CG.

When comparing the TG and CG, the findings indicated that conventional clinical variables including gingival, probing

Table 1. *Medical characteristics of the TG compared within the group Treatment results of dental implants.*

		LN	IN	OE	LTO	AOO
	Mean	(S.D)				
Baseline	2.55	0.30	2.50 (0.20)	5.60 (0.89)	8.90 (0.98)	0.0 (0.0)
4 Month	1.45	0.29	1.35 (0.20)	4.7 (1.10)	7.99 (0.90)	0.42 (0.38)
8 Months	1.60	0.35	1.45 (0.35)	4.3 (0.89)	7.20 (1.10)	0.70 (0.37)
12 Months	1.80	0.30	1.6 (0.40)	4.15 (0.90)	7.0 (1.25)	0.96 (0.42)
p Value(Significance)		p < 0.001				
ANOVA F Value		< 0.001**	< 0.001**	< 0.001**	< 0.001**	< 0.001**

Table 2. *TG measures repeated using ANOVA and Bonferroni's post hoc test.*

	IN		LN		LTO score		AOO score		OE score	
	Mean	P value	Mean	P value	Mean	P value	Mean	P value	Mean	P value
Baseline vs. 4 Months	1.110	($p < 0.001$)	1.10	($p < 0.001$)	0.95	($p < 0.001$)	0.42	($p < 0.001$)	0.92	(p < 0.001)
Baseline vs. 8 Months	1.020		0.99		1.6		0.70		1.36	
Baseline vs. 12 Months	0.855		0.81		1.10		0.97		1.43	
4 Months vs. 8 Months	0.10	(0.872)	0.2	(0.855)	0.70	($p < 0.417$)	0.28	(0.221)	0.44	(0.681)
4 Months vs. 12 Months	0.27	(0.162)	0.30	(0.148)	0.97	($p < 0.417$)	0.55	(0.04)	0.51	(0.566)

Table 3. *Diagnostic indicator relation within the control group.*

	LN		NI	OE	LTO	AOO
	Mean	S.D				
4 Month	1.74	0.35	1.37 (0.28)	4.15 (0.90)	7.22 (0.72)	0.41 (0.22)
8 Months	1.88	0.33	1.60 (0.35)	3.9 (0.95)	7.0 (0.89)	0.75 (0.25)
12 Months	1.96	0.27	1.80 (0.38)	3.4 (0.81)	6.4 (0.55)	1.09 (0.45)
Baseline	2.69	0.25	2.54 (0.28)	4.84 (0.79)	8.0 (0.82)	0.0 (0.0)
ANOVA F Value		24.645	30.819	6.698	9.439	29.342
p Value (Significance)	p < 0.001					

Table 4. *Statistical analysis for the CG using multiple assessments ANOVA and Bonferroni's post hoc test.*

	IN score		LN		LTO score		OE score		AOO score	
	Mean	P value	Mean	P value	Mean	P value	Mean	P value	Mean	P value
Baseline vs. 4 Months	1.17	($p < 0.001$)	0.97	($p < 0.001$)	0.69	($p < 0.001$)	0.71	($p < 0.001$)	0.41	($p < 0.001$)
Baseline vs. 8 Months	1.1		0.81		1.1		1.02		0.75	
Baseline vs. 12 Months	0.742		0.73		1.6		1.46		0.10	
4 Months vs. 8 Months	0.18	(0.588)	0.15	(1.648)	0.32	(1.733)	0.32	(1.782)	0.336	(1.005)
4 Months vs. 12 Months	0.426	(0.013)	0.23	(1.260)	0.92	(1.024)	0.76	(1.124)	0.685	(1.04)
8 Months vs. 12 Months	0.27	(0.217)	0.084	(1.902)	0.61	(1.221)	0.08	(1.558)	0.349	(1.032)

Table 5. *Means of LN, IN, OE, LTO, and AOO among test and CG at various scheduling intervals.*

		Baseline		4 Month	8 Month	12Month	
IN		Mean	SD				
TG (n = 12)		2.50	0.20	1.35 (0.20)	1.45 (0.29)	1.6 (0.37)	TG (n = 12)
CG (n = 13)		2.54	0.28	1.37 (0.28)	1.60 (0.35)	1.80 (0.38)	CG (n = 13)
NP (T)	p value	0.438	0.438	0.836	0.494	.235	NP(T)
AOO							
TG (n = 12)		0.0	0.0	0.42 (0.38)	0.70 (0.37)	0.96 (0.42)	
CG (n = 13)		0.0	0.0	0.41 (0.22)	0.75 (0.25)	1.09 (0.45)	
NP (T)	p value	-	-	0.931	0.751	0.463	
LTO							
TG (n = 12)		8.9	0.98	7.99 (0.90)	7.20 (1.10)	7.0 (1.25)	
CG (n = 13)		8.0	0.82	7.22 (0.72)	7.0 (0.89)	6.4 (0.55)	
NP (T)	p value		0.024	0.050	0.486	0.120	
OE							
TG (n = 12)		5.6	0.90	4.65 (1.03)	4.3 (0.89)	4.15 (0.90)	
CG (n = 13)		4.9	0.80	4.15 (0.90)	3.9 (0.95)	3.37 (0.81)	
NP (T)	p value		0.052	0.182	0.318	0.039	
LN							
TG (n = 12)		2.55	0.30	1.45 (0.29)	1.60 (0.35)	1.80 (0.26)	
CG (n = 13)		2.54	0.28	1.74 (0.35)	1.88 (0.33)	1.96 (0.27)	
NP (T)	p value		0.16	0.035	0.025	0.033	

Table 6. *Average fundamental stability in the experimental and CG compared TG.*

Groups	TG (n = 12) Mean (SD)	CG (n = 13) Mean (SD)	Independent t test p value
Baseline	32.82 (7.84)	38.09 (6.56)	0.095

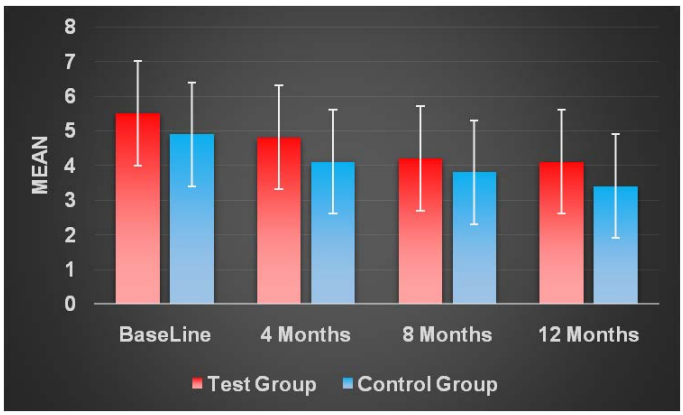

Figure 3. *Intergroup assessment of mean PD.*

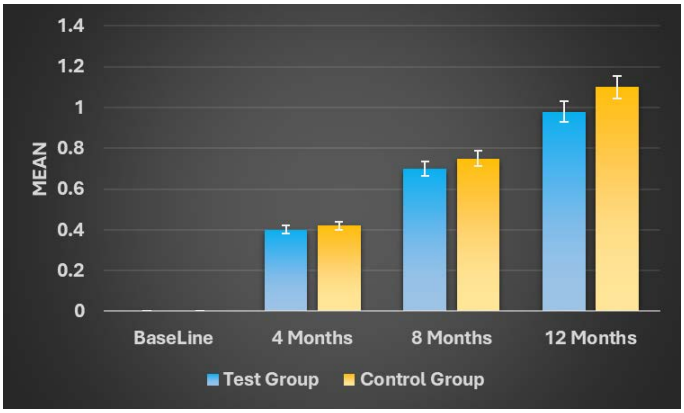

Figure 4. *Intergroup assessment of Mean LTO.*

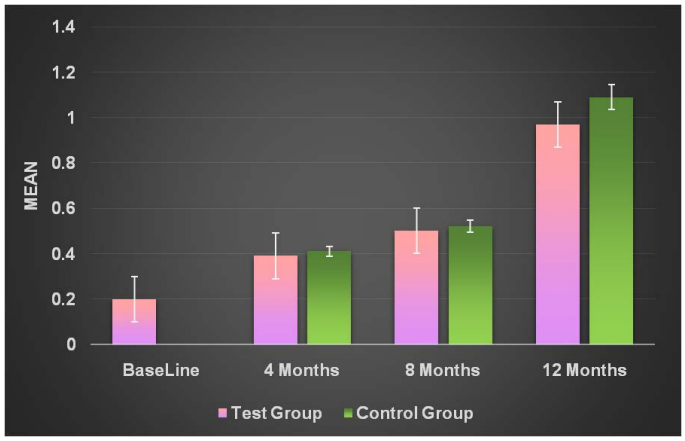

Figure 5. *Evaluation of AOO among groups.*

depth, plaque index, and clinical attachment level all improved after 12 months compared to the the beginning. However, when it came to probing depth and plaque index, the variance was not statistically significant. A 12-month follow-up was conducted on the implants in both groups. According to Table 5, there was no significance variation in the marginal bone loss.

The surviving rate of initial implants in the photodynamic therapy (PDT) group was comparable to that in the scaling and root planing (SRP) group. The soft and hard tissues surrounding the implant were in a state of good health. All the implantation between the TG and CG remained intact without any complications, and the recovery measure, as assessed by the Lein Huin Hang index, was typically considered effective.

Conclusion.

The early findings of PDT treatment for dental deterioration in adults with dental implant patients. Photosensitive chemicals and light target and remove germs in DD, possibly improving early dental implant success and healing. According to the findings of this controlled research, individuals with chronic periodontitis require a fast implant placement that benefits from PDT as an adjunct to SRP. The early implantation of implants for patients with a history of periodontitis is an excellent therapy choice that contradicts earlier results. It seemed that the survival rate of immediate implantation was high in the period considered. In an experiment of 16 patients with 25 dental implants, CG and TG were examined for marginal bone loss at various periods. The 13-patient CG attended 1.10 mm marginal bone loss during the year. The TG of 12 patients had 0.97 mm less bone loss during the same period. The long-term effectiveness and endurance of such therapies are likely to be well-established due to a limited investigation on this purpose. Future studies of efficacy are providing important insights into the success rates, healing mechanisms, and general patient satisfaction related to dental implants after photodynamic therapy for DD.

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