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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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UNDERSTANDING THE LONG-TERM INTERPLAY BETWEEN GLUCOCORTICOIDS, PARATHYROID HORMONE LEVELS, AND OSTEOPOROSIS IN PATIENTS

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Abstract.

Drugs called glucocorticoids (GC) are often prescribed for both inpatient and outpatient settings. They are often used to treat a number of disorders due to their anti-inflammatory activity. Long-term use of GCs, especially long-term high-dose administrations, may result in a variety of negative effects. In Hilla City, Babylon Governorate of Iraq, Merjan Teaching Hospital, Al-Hilla Teaching Hospital's Joint Enology Clinic, and Al-Imam Al-Sadiq Hospital, were the sites of this case-control research, which was carried out. There were 100 total participants in this trial, of whom 50 were patients with osteoporosis (OP). The ages of the patients and the control collection were. They were chosen since their gender and ages matched. The findings show extensively senior level of parathyroid hormone (PTH) in OP patients when compared to the control group, whereas calcium (Ca) level into the patient group significantly lowered during association toward the manage set. In summary, there is a positive correlation between PTH and the condition of bone mineralization. In those who use GCs for a long time, PTH may be used as a prognostic marker to predict when bone mineral abnormalities would develop.

Key words. Calcium (Ca), osteoporosis (OP), parathyroid hormone (PTH), glucocorticoids (GC).

Introduction.

A frequent skeletal condition known as osteoporosis (OP), which affects bone health and bone mineral density (BMD),strength, fracture risk is increased, which frequently have incapacitating effects. The intricate interaction of many different elements that contribute to its etiology, including hormone imbalance, genetic predispositions, and lifestyle decisions. Two important factors that influence the development and progression of OP have been identified among these factors: the use of glucocorticoids (GCs) and parathyroid hormone (PTH) levels [1]. The powerful anti-inflammatory and immunosuppressive properties of GCs, a subclass of steroid hormones, make them crucial for the treatment of inflammatory and autoimmune illnesses. However, GCs have been linked to damaging effects on bone health when used frequently or in large amounts. They have the potential to upset the delicate balance between bone formation and resorption, which is the main cause of these negative effects. GCs accomplish this by decreasing osteoblast activity, increasing renal calcium excretion, and decreasing intestinal calcium absorption. Osteoblasts are the cells that produce bones. As a result, there is a net decrease of bone mass, which greatly increases the risk of fractures [2]. PTH, on the other hand, is essential for preserving the body's calcium homeostasis. When necessary, PTH works with osteoblasts and osteoclasts, the cells that regulate bone, to release calcium from the bone matrix and maintain proper blood levels. This equilibrium can be upset by abnormal PTH levels, which can also aid in the emergence of OP. Underscoring the delicate nature of calcium management in bone health, hyperparathyroidism (excess PTH production) and hypoparathyroidism (insufficient PTH production) have both been associated with increased bone loss and fragility fractures [3]. For the management and treatment of individuals at risk to be effective, it is crucial to comprehend the long-term interactions between GCs, PTH levels, and OP. Although GCs are frequently used to treat immune system conditions and inflammation, continuous high-dose use of GCs can result in glucocorticoid-induced OP, a serious iatrogenic side effect. By promoting osteoclast development and maturation in the early phases, GCs encourage bone resorption. The essential participants in bone formation, osteoblasts and osteocytes, are killed off as a result of their prolonged use, which inhibits osteoblastogenesis [4]. Additionally, the recovery from bone fractures is a fascinating and complex event. Bones can recover without leaving fibrous scars, unlike other human organs. A series of cellular signaling mechanisms are started after a fracture. Increased blood flow to the fracture site brought on by inflammation makes it easier for cells, nutrients, and growth factors to enter, which is needed for the start of healing processes. These procedures combine to help the bone regenerate a new matrix, repairing the structural and functional damage [5]. Beyond bone health, the effects of therapeutic GCs and chronic inflammation also have an impact on the metabolism of both bones and muscles. Through different methods, therapeutic GCs and inflammatory processes cause systemic OP and muscular atrophy. The intricate linkages between in vivo GCs and the catabolic and anabolic signaling pathways that control metabolism further amplify the complexity of these connections. The interactions between therapeutic GCs and inflammatory bone loss and muscle atrophy have been studied in depth, revealing light on their complex nature [6].

The study [7] a list of the several OP remedies currently available, including bone-building and antiresorptive medications, is offered together with an assessment of potential future treatment choices. The study [8] examined the information that is currently known on the impacts of COVID-19, its treatment, and the pandemic's overall implications on bone health. They also examine the data and professional advice on

potential impacts of OP drugs on COVID-19 results and vaccine effectiveness, and they compile suggestions for continuing OP therapy during the pandemic. Article [9] provided a general summary of the variables governing the link between mental tension and osteoarthritis. These elements may be separated into a division between psychological and metabolic alterations brought on by mental pressure. Endocrinological alterations, such as elevated Leptin, PTH, GCs, prolactin, and decreased gonadal hormones, are among the physiological reasons. The research [10] examined the makeup of the effects of the human gut microbiome on osteoclastogenesis and bone healing, particularly in OP cases. A healthy microbiota is linked to bone homeostasis, according to recent studies, despite the fact that the pathophysiology of OP and other bone diseases as well as the normal physiologic mechanisms of bone repair are now fairly well understood. The research [11] examined bone metabolism in 30-50-year-old males with T2DM. 160 T2DM patients and 69 nondiabetics provided blood and anthropometric samples. PTH, PINP, Cross-linked type collagen C-telopeptide (-CTX) as well as OC be calculated. T2DM and control groups had similar ages, pounds, systolic blood pressure, blood minerals, creatine level, protein content in general, and the amount of albumin are all important considerations.

The article [12] examined the relationships between PTH, P, Fibroblast growth factor 23 (FGF23), Ca, a mineral calcitriol, and klotho with the Wnt/-catenin pathway, the Osteoprotegerin (OPG)/Receptor Activator of Nuclear Factor Kappa-B Ligand (RANKL) system, as well as the consequences of these relationships for bone and cardiovascular problems in Chronic Kidney Disease (CKD). The study [13] determined is to highlight possible multi-system consequences of pharmaceutical therapies and to outline potential linkages between psychological stress and OP. It is not meant to provide therapeutic advice. There are numerous possibly overlapping mechanistic pathways that may be of interest, according to a review of recent research. The research [14] examined contemporary genomic and biochemical viewpoints about osteosarcoma and chiropractic care and is based on a careful review of the obtainable material. For scholars and medical professionals, it offers knowledge that is backed up by research to help in fractures diagnosis. However, there are many unanswered problems concerning fractures and their management that need additional research. The study [15] provided bone-modifying drugs are used to treat and prevent Mineral and Bone Disorder (MBD). Bisphosphonates and denosumab are essential for MBD prevention. These substances don't really strengthen bone or treat MBD. MBD lesions may recover with the use of more recent anabolic drugs, including anti-sclerostin antibodies, PTH, anti-Dickkopf-1 antibodies, and others. In the next years, new medications may alter MBD treatment. The article [16] examined the most recent clinical care recommendations for osteonecrosis of the jaw (ONJ), the crucial role dental-medical management plays in reducing risks, and the most recent knowledge about how mostly osteoclast-modulating medications affect bone homeostasis. The research [17] provided to developing concept for GC-induced osteoporosis (GIOP) management and avoidance by considering the probable actions of GM and its derivatives on the OP in addition to the calming impact of GC on GM. The research [18] determined a current overview among the books analyzing the connection flanked by fillet biology and impulses for reproduction other than oestrogens and testosterone, such as prolactin, progesterone, luteinizing hormone, follicle-stimulating hormone, kisspeptin, gonadotropin-releasing hormone, inhibin, activin, and relaxin. The study [19] examined the state of the understanding of osteoclast lacunar mineralization, or micropetrosis. Micropetrosis be extra prevalent in elderly osteo and skeleton with OP and is a sign of previous osteocyte death. Given to the amount for each bone region, processed osteocyte spaces may discriminate between well, organic osteoporotic individuals with osteoporotic patients receiving bisphosphonate therapy, it may exist considered as a unique structural indicator of poor fillet excellence. The research [20] determined comprehend the current OP pathogenicity, which includes the factors chronic steroid use, malnutrition, and pro-inflammatory cytokines, to support the therapy approaches stating that diverse pathogenic processes might lead to OP a favable the results of fractures in persons with CD. The article [21] provides It is feasible to conceive of the number of calcified osteocyte gaps per bone area may be an architectural indication of poor oral health. Because the number of mineralized osteocyte lacunae may discriminate between healthy people with OP who are not being treated for their condition and patients who are being treated for their condition with bisphosphonates. The process of lacunar mineralization has to be clarified, and it also needs to be investigated in order to determine whether or not it might be a new target for preventing or treating bone fragility brought on by ageing and other endocrine problems.

The research [22] determined the employing HR-pQCT, or high-resolution peripheral quantitative computed tomography, the long-term effects of robotic-assisted radical breast conservation surgery on the bone microarchitecture of a sample population of African American and Latina women. In addition, they wanted to increase knowledge by examining changes in trabecular morphology using HR-pQCT and a one-of-a-kind approach known as individual trabecula segmentation (ITS)-based morphological analysis. Both of these methods were used in conjunction with one another. After Roux-en-Y gastric bypass (RYGB), they hypothesised that the microarchitecture would degenerate, and both trabecular plates and connections would be lost. The study [23] examined the possible processes that are responsible for Medication-Assisted Treatment (MAT) expansion in the absence of oestrogen and provide a summary of the latest evidence about the pathogenic activities of MAT in bone remodelling, they discuss the OP therapies that are now available that focus on MAT. In instances when oestrogen levels are low, a complete sympathetic of the relationship among MAT development and fillet metabolism may reveal novel information regarding potential Postmenopausal Osteoporosis (PMOP) therapeutic targets. The research [24] examined to understand how many factors, both well-known and unknown, contribute to the emergence of OP in people with rheumatoid arthritis (RA). The objective is based on the relationship between autoantibodies and bone remodeling. In addition, their findings imply that other ways of determining bone mineral density when a person has early arthritis can be useful as an indicator of severity. The article [25] proposed on humans that

uses impact microindentation (IMI) in vivo not only tackles the many study designs, but also the prospective outcomes and the practical features of the method . There were forty-eight studies that were found in the results of the search that demonstrated the effectiveness of IMI in identifying patients who had primary OP and fractures, patients who had secondary OP brought on by a variety of different underlying systemic disorders, and patients who had alterations in the bone material strength index (BMSi) following bone-modifying therapy, which used corticosteroids as one of its components [26]. However, longitudinal data is lacking. On the other hand, the primary outcome indicator did not display a consistent degree of consistency across trials.

Materials and Methods.

Ethics-Related Matters: The study was carried out in conformity with ethical standards and was given the go-ahead by the ethics committee (Approval Reference Number: [Reference Number]). Before each person was enrolled in the study, their informed consent was obtained. Participants received thorough explanations of the study's goals, methods, potential risks, and the right to discontinue participation at any time. Each participant signed consent forms attesting to their voluntarily taking part in the study.

Analysis of Statistics: Statistical software or a package was used to analyze the data. For the demographic and clinical data, descriptive statistics such as means, standard deviations, and frequencies were computed. [Specify suitable statistical tests, e.g., t-tests for continuous variables, chi-squared tests for categorical variables] were carried out to evaluate differences between the patient and control groups. At p 0.05, statistical significance was considered to be present. To account for potential Type I errors, [if appropriate] post-hoc tests or corrections for multiple comparisons, such as the Bonferroni correction, were used. This updated Methods section provides a more thorough explanation of the study's methods by including information on ethics and statistical analysis.

Results.

OP affected 41-50-year-olds. Table 1 shows the mean standard deviation (SD) PTH levels for OP patients and controls, with a p-value of 0.0001.

Table 1 shows the mean SD Ca levels for patients and controls (7.5 and 9.06 mg/dl) and the p-value of 0.0001. The receiver operating characteristic (ROC) curve between patients and controls shows the prediction value of PTH levels on the impact of long-term GC usage on bone and its likely mechanism of producing OP. The area under the curve (AUC) =0.83, P= 0.00, and the 1Cut-off point was 198.1 pg/ml (specificity 84.5 %, sensitivity 78).Figure 1 demonstrate ROC curve analysis is a statistical technique used to evaluate a test's or a prediction model's diagnostic efficacy. Evaluation of a diagnostic tests or biomarker's capacity to discriminate between patients and controls is a typical task in medical research.

Long-term GC use, also known as glucocorticoid use, is the prolonged use of drugs like prednisone or dexamethasone that include synthetic corticosteroids. Usually, it lasts between weeks and months. In addition to possible side effects including weight gain, bone weakening, and increased susceptibility to infections, prolonged use may have hazards. When considering protracted GC therapy, thorough management and monitoring are essential. Although the exact process by which the usage of glucocorticoids (GC) modifies the levels of parathyroid hormone (PTH), it probably involves a number of variables. Lower serum calcium levels may result from GCs' ability to reduce intestinal absorption of calcium. The parathyroid glands may respond by producing more PTH in order to maintain calcium homeostasis as a result of this decrease in calcium. Furthermore, GCs may have a direct impact on the parathyroid cells' sensitivity to calcium levels. The specific mechanisms and interactions are intricate and could differ from person to person.

Table 1. *PTH & Ca comparison among patients as well as controls.*

Group	(PTH (pg/ml)	Ca (mg/dl)
P-value	0.0001	0.0001
Patients	858.03±42.64	7.34±0.18
Control	613.84±23.14	8.98±0.10

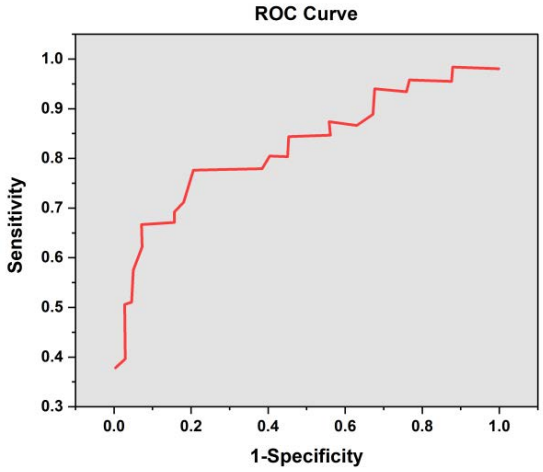

Figure 1. *ROC curve study for PTH distinguishing patients from controls.*

Discussion.

The current research found that long-term GC users had significantly lower levels of PTH than the control group, with significant differences. The results of the current investigation are consistent, which ascribed their findings to the production of OP by GCs, one of the most prevalent secondary OP. Fracture risk and bone BMD are influenced by GCs. The current study concurs with Yamamoto and Sugimoto's study, which found that the use of GCs causes OP to affect bone metabolism by temporarily enhancing bone resorption and continuously suppressing bone formation. The hormone that controls vitamin D metabolism and renal Ca absorption is called PTH. Circulating PTH concentrations increase in long-term GC usage as renal function declines. The long-term use of GCs on bone and their method of causing OP include secondary hyperparathyroidism, which is linked to fast bone turnover, ectopic calcification, and greater cardiovascular mortality. Raised PTH and reduced blood Ca are two biochemical alterations brought on by long-term GC usage on bone.

The findings of the current investigation were in agreement with those of the Patschan et al. study, which revealed the following: Clinically severe bone loss is typically caused by long-term GC therapy. Numerous GC-mediated mechanisms, such as the following, contribute to the loss of bone density. (i) Although D vitamin has a little role in the pathophysiology of steroid-induced OP, its effects may be amplified in the presence of GCs. (ii) When GCs are present, PTH's effects can be more obvious. (iii) GCs inhibit the osteoanabolic effects of sex hormones and lower gonadal activity. (iv) A negative Ca balance, which is brought on by higher renal excretion and lower intestine absorption of Ca, has been linked to secondary hyperparathyroidism. It has long been believed from a mechanistic standpoint that only genomic events may mediate the aforementioned effects at the molecular level. Despite this, there is mounting evidence that challenges this conventional mode of action and supports rapid GC effects. These quick effects, also known as nongenomic effects, are the consequence of GCs' interactions with cellular membranes, whether by binding to membrane receptors or through physicochemical interactions. Even though it hasn't been shown, these effects presumably have an impact on the pathogenesis of GC-induced osteoporosi. Medical professionals attempted to replace or lower the amount of corticosteroids by employing adjuvant anti-inflammatory medicines given by central nervous system (CNS) pharmaceuticals or biological treatment such as stem cells or cytokines. Cellular surrounding the mellium had a significant impact on the localised adverse effects profile.

Conclusion.

According to the data, it would seem that individuals who used GCs often had lower levels of PTH. Ca and the hormone produced by the parathyroid gland known as PTH may both have a role in successfully signaling the condition of bone mineralization. PTH levels may be utilized as a prognostic indicator to foresee the development of bone mineral abnormalities in patients who have been taking GCs for an extended length of time. This can be done in patients who have been using GCs for an extended period of time.

REFERENCES

1. Mei J, Hu H, Ding H, et al. Investigating the causal relationship between ankylosing spondylitis and osteoporosis in the European population: a bidirectional Mendelian randomization study. Frontiers in Immunology. 2023;14:1163258.
2. Buhre J.S, Becker M, Ehlers M. IgG subclass and Fc glycosylation shifts are linked to the transition from pre-to inflammatory autoimmune conditions. Frontiers in Immunology. 2022;13:1006939.
3. Wilkens M.R, Nelson C.D, Hernandez L.L, et al. Symposium review: Transition cow calcium homeostasis—Health effects of hypocalcemia and strategies for prevention. Journal of dairy science. 2020;103:2909-2927.
4. Llorente I, García-Castañeda N, Valero C, et al. Osteoporosis in rheumatoid arthritis: dangerous liaisons. Frontiers in medicine. 2020;7:601618.
5. Samadian H, Maleki H, Fathollahi A, et al. Naturally occurring biological macromolecules-based hydrogels: Potential biomaterials for peripheral nerve regeneration. International journal of biological macromolecules. 2020;154:795-817.
6. Webster J.M, Kempen L.J, Hardy R.S, et al. Inflammation and skeletal muscle wasting during cachexia. Frontiers in physiology. 2020;11:597675.
7. Föger-Samwald U, Dovjak P, Azizi-Semrad U, et al. Osteoporosis: Pathophysiology and therapeutic options. EXCLI J. 2020;19:1017-1037.
8. Cromer S.J, Yu E.W. 2021. Challenges and opportunities for osteoporosis care during the COVID-19 pandemic. J of Clin Endocrinol Metab. 2021;106:e4795-e4808.
9. Ng J.S, Chin K.Y. Potential mechanisms linking psychological stress to bone health. International J of Medical Sciences. 2021;18:604.
10. Seely K.D, Kotelko C.A, Douglas H, et al. The human gut microbiota: a key mediator of osteoporosis and osteogenesis. International J of Molecular Sciences. 2021;22:9452.
11. Lippi L, Folli A, Curci C, et al. Osteosarcopenia in Patients with Chronic Obstructive Pulmonary Diseases: Which Pathophysiologic Implications for Rehabilitation?. International Journal of Environmental Research and Public Health. 2022;19:14314.
12. Carrillo-López N, Martínez-Arias L, Fernández-Villabrille S, et al. Role of the RANK/RANKL/OPG and Wnt/β-catenin systems in CKD bone and cardiovascular disorders. Calcified Tissue International. 2021;108:439-451.
13. Chen L.R, Ko N.Y, Chen K.H. Medical treatment for osteoporosis: from molecular to clinical opinions. International J of molecular sciences. 2019;20:2213.
14. Ng J.S, Chin K.Y. Potential mechanisms linking psychological stress to bone health. International J of Medical Sciences. 2021;18:604.
15. Lu H, Pundole X, Lee H.C. The role of bone-modifying agents in myeloma bone disease. JBMR plus. 2021;5:e10518.
16. Carrillo-López N, Martínez-Arias L, Fernández-Villabrille S, et al. Role of the RANK/RANKL/OPG and Wnt/β-catenin systems in CKD bone and cardiovascular disorders. Calcified Tissue International. 2021;108:439-451.
17. Wan J.T, Sheeley D.M, Somerman M.J, et al. Mitigating osteonecrosis of the jaw (ONJ) through preventive dental care and understanding of risk factors. Bone research. 2020;8:14.
18. Zhou R.X, Zhang Y.W, Cao M.M, et al. Linking the relation between gut microbiota and glucocorticoid-induced osteoporosis. J of Bone and Mineral Metabolism. 2023;41:145-162.
19. Mills E.G, Yang L, Nielsen M.F, et al. The relationship between bone and reproductive hormones beyond estrogens and androgens. Endocrine Reviews. 2021;42:691-719.
20. Milovanovic P, Busse B. Phenomenon of osteocyte lacunar mineralization: indicator of former osteocyte death and a novel marker of impaired bone quality?. Endocrine connections. 2020;9:R70.
21. Anabtawi A, Le T, Putman M, et al. Cystic fibrosis bone disease: pathophysiology, assessment, and prognostic implications. J of Cystic Fibrosis. 2019;18:S48-S55.

22. Milovanovic P, Busse B. Phenomenon of osteocyte lacunar mineralization: indicator of former osteocyte death and a novel marker of impaired bone quality?. Endocrine connections. 2020;9:R70.
23. Krez A, Agarwal S, Bucovsky M, et al. Long-term bone loss and deterioration of microarchitecture after gastric bypass in African American and Latina women. The Journal of Clinical Endocrinology & Metabolism. 2021;106:1868-1879.
24. Li J, Chen X, Lu L, et al. The relationship between bone marrow adipose tissue and bone metabolism in postmenopausal osteoporosis. Cytokine & growth factor reviews. 2020;52:88-98.
25. Llorente I, García-Castañeda N, Valero C, et al. Osteoporosis in rheumatoid arthritis: dangerous liaisons. Frontiers in medicine. 2020;7:601618.
26. Schoeb M, Hamdy N.A, Malgo F, et al. Added value of impact microindentation in the evaluation of bone fragility: a systematic review of the literature. Frontiers in Endocrinology. 2020;11:15.