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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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LEVELS OF OSTEOPROTEGERIN AND IRISIN IN POSTMENOPAUSAL OSTEOPOROSIS WOMEN

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Abstract.

Background: Osteoporosis (OP) is a highly prevalent disorder affecting 50 million individuals around the world. It is also a typical skeletal disorder described by low bone mass, which leads to reduced bone strength and an enhanced risk of fractures. Osteoprotegerin As a member of the TNF receptor superfamily, osteoprotegerin is well recognized for its protective effect against excessive bone resorption. Irisin is Irisin is a muscle-secreted hormone that is generated by the cleavage of membrane protein FNDC-5 (fibronectin type III domain-containing protein 5) (FNDC5). Irisin is widely distributed in the human body and is involved in the browning of white adipose tissue, improving insulin resistance, improving cognitive function, and regulating bone metabolism. **Methods:** This study was a prospective cross-sectional study involving 90 postmenopausal osteoporosis (PMOP) Iraqi women in Kirkuk City over one year time; from April 2023 to the end of July 2024. Sixty women with osteoporosis are diagnosed by DEXA. And 30 women as a control group. The blood samples were collected from each woman included in this study for the estimation of osteoprotegerin and irisin. Were measured using the ELISA kit.

Result: This was conducted on sixty postmenopausal osteoporosis women. The age range was (50-65) years and the mean body mass index was (30.05) and thirty women as a control group. The age range was (50-65) years, and the mean body mass index was (27.55). The study found that the mean serum level of osteoprotegerin, increased in postmenopausal osteoporosis women compared to control (P-Value = 0.0007, while the mean serum level of irisin was lower in postmenopausal osteoporosis women compared to control this result was highly significant at a P value of 0.0004.

Conclusion: This study reveals that there was a positive correlation between serum osteoprotegerin, level with irisin (R=0.175).

Key words. Postmenopausal osteoporosis, osteoprotegerin and irisin.

Introduction.

According to the World Health Organization's 1993 definition, osteoporosis is a systemic skeletal disease that causes bones to lose mass, their microarchitecture to deteriorate, and their fragility and fracture risk to rise [1]. Also, it has been shown that osteoporosis may happen when the function of bone cells is not balanced. Due to its impact on public health, this illness has been dubbed "the silent epidemic of the 21st century." Being the most prevalent metabolic bone disease, it is a silent killer that worsens with time [2].

The World Health Organization (WHO) definition of menopause is permanent menstruation termination due to the lack of follicular ovarian function. Thus, the start of menopause based on spontaneous amenorrhea was retroactively assessed for 12 months, postmenopausal osteoporosis (PMOP) is a relatively common skeleton that affects 50% of women over 45 years leading to bone fractures and disability [3]. To diagnose and track osteoporosis, the most reliable way to evaluate bone mineral density is via Dual Energy X-ray absorptiometry (DXA) scanning [4]. Nuclear magnetic resonance angiography (DXA) can measure bone density in both central and peripheral locations, such as the lumbar spine, hips, and distal forearms. Clinicians can monitor the development of BMD loss over time with the use of DXA due to its great accuracy [5]. DXA was used in the present study to aid in the diagnosis of OP.

Osteoprotegerin It is well-known that OPG, which is a member of the TNF receptor superfamily, protects against excessive bone resorption [6]. A signal peptide and seven functional domains make up the OPG protein as a whole. The mature OPG is released from the cytoplasm to the extracellular compartment after homodimerization and proteolytic cleavage of the signal peptide [7]. An important finding was that OPG could bind to and suppress the action of TRAIL (TNF-related apoptosis-inducing ligand), and it was proposed that cells may have a survival advantage if they produced OPG. Among the many tissues where OPG may be discovered are vascular tissues, bone, testicles, kidneys, liver, lungs, and heart [8].

Irisin, first discovered in animals and later in humans [9], Irisin is a thermogenic protein that increases energy expenditure via white adipose tissue browning; it is a member of the family of adipokines because of its dual action in adipose and muscle tissue [10]. Irisin dissipates energy as heat [11]. Irisin is a protein of 112 amino acids and a molecular weight of 12 kDa. Bostrom et al. isolated it from muscle tissue, gave it a name, and conducted its first chemical characterization [12]. The majority of irisin is produced by skeletal muscles. The pancreas, testes, liver, and stomach are other organs where it has been identified. The primary aim of the study on levels of osteoprotegerin and irisin in postmenopausal osteoporosis women is to elucidate the role these biomarkers play in the pathophysiology of osteoporosis, thereby contributing to enhanced diagnostic and therapeutic strategies.

Patients, Materials and Methods.

This study is a cross-sectional, hospital-based study. The protocol of this study was approved by the scientific committee of Tikrit University-College of Medicine, and the agreement of the attendance to Kirkuk General Hospital to collect samples from patients was approved by the Kirkuk Health Directorate. This study was carried out at the Kirkuk General Hospital in Kirkuk City- Iraq from the 1st of April 2022 to the end of July 2024. A verbal consent was taken from each woman included in this study whether considered as a case or control.

To take part in this study sixty women with osteoporosis who were 50-65 years old. The DEXA scan is used to detect osteoporosis in women. The T-score is a determining factor in bone density test findings. The following is how this number compares to the bone density of young, healthy individuals:

Proper result: more than -1.
Low bone density: -1 to - 2.5.
Osteoporosis: less than -2.5.

Thirty women without osteoporosis, ranging in age from 50 to 65 years, were contacted for participation in this research. Each woman who participated in this study had 5 millilitres of her venous blood drawn into a centrifuge tube using a sterile disposable syringe. After letting the blood clot at room temperature, the tubes were spun at 3000 revolutions per minute for 15 minutes. The serum that formed a supernatant was then removed, divided into portions in Eppendorf tubes, and kept in a deep freezer at -20°C until the estimation was ready. Serum osteoprotegerin and irisin assays were performed on both the patients' and the controls' samples.

Statistical analysis: All the data collected in this study were analyzed by using the student t-test, the mean, standard deviation, and P-value were also considered. The significance was considered at a P value of less than 0.05. The correlation was considered as follows:

Interpretation of R-value (correlation coefficient)

- 0.70. A strong negative correlation.
- 0.50. A moderate negative correlation.
- 0.30. A weak negative correlation.
+ 0.30. A weak positive correlation.
+ 0.50. A moderate positive correlation.
+ 0.70. A strong positive correlation.

Results.

The mean differences in OPG levels (pg/ml) in patients with OP and the control group. There were significant differences between the means of OPG level of the study group (P 0.01), the mean ±SD for patients (386.2±65.6 pg/mL) mean serum level of osteoprotegerin in PMOP women, was significantly higher than that of the control women (219.8±48.5pg/mL). This study reveals that the mean serum level of irisin in PMOP women 20.92 ± 7.60ng/mL was significantly lower than the control 34.27±6.23 ng/mL (Table 1). The results showed significantly lower serum irisin levels among osteoporosis women, compared to the control group at a p-value of 0.0004 (Table 1).

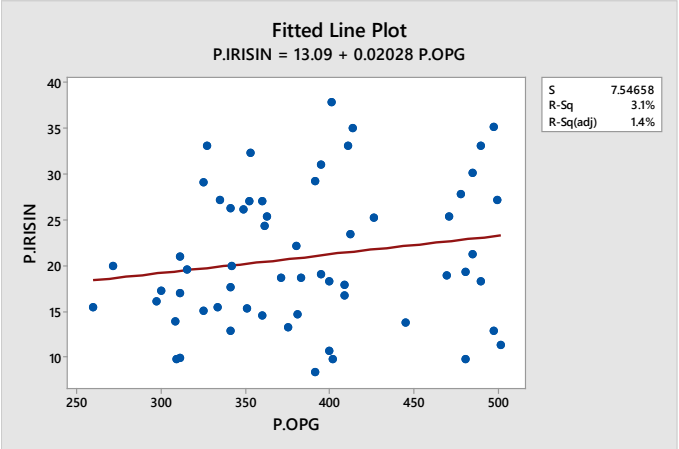

Figure 1. *The correlations between osteoprotegerin and irisin.*

Table 1. *Serum Level of Osteoprotegerin and Irisin in PMOP Women and the Control Group.*

Parameters	Control (n=30)	Patients (n=60)	p-value
OPG (pg/mL)	219.8±48.5	386.2±65.6	0.0007
Irisin (ng/mL)	34.27 ± 6.23	20.92 ± 7.60	0.0004

It is evident from this study that there was a positive correlation between serum osteoprotegerin, level with irisin (R=0.175) (Figure 1).

Discussion.

Previous research has shown that osteoporotic women have higher levels of circulating OPG compared to controls. This may be a protective mechanism that slows down the increased bone resorption and subsequent bone loss that occurs in osteoporosis. This study's results also support the idea that serum OPG levels, independent of bone density and turnover markers, are associated with vertebral fracture status [13,14], and this result disagrees with a study done in (2022) demonstrated that patient serum OPG levels were much lower than control levels [15]. Possible causes for this outcome include individual and genetic variances, variations in the study's methodology, and variations in the tests and laboratories used.

The secretory glycoprotein OPG was first identified in 1997 as a product of a single-copy gene with five exons and twenty-nine pairs of kilobases [16]. In humans, this gene is found on chromosome 9. In addition to encoding osteoblast-stimulating Core-binding factor alpha-1 (CBFA-1), this gene [17]. The available data suggests that a possible link between decreased bone resorption and osteoporosis and increased OPG levels. On the other hand, we demonstrated in this paper that osteoporosis patients had elevated OPG levels.

The results showed significantly lower serum irisin levels among osteoporosis women, compared to the control group at a p-value of 0.0004 ** This result was in agreement with a previous study done in 2021 by Roomi et al. [18] showed significant differences in irisin levels in cases vs. controls (p< 0.0001) the mean serum level of irisin in the patient is lower than the control group. Another study showed serum irisin levels were decreased in women with osteoporosis compared to control [19].

Research has shown that individuals suffering from osteoporosis tend to have lower serum irisin concentrations. Myokine irisin may protect against metabolic diseases. There is evidence that serum irisin concentrations are lower in osteoporosis patients, which is consistent with our findings [20,21]. Zhang et al. revealed that. Irisin also induces osteoblast differentiation [22].

It is evident from this study that there was a positive correlation between serum osteoprotegerin, level with irisin (R=0.175), This study agrees with a previous study that found these associations are particularly interesting as these osteogenic factors are secreted by osteoblasts and contribute to regulating bone cell differentiation [23,24]. The skeletal muscles are the principal sites of irisin secretion. According to reports, irisin is crucial for the connection between bone metabolism and muscle tissue,

indicating a robust relationship between the two [25]. However, it was shown that irisin significantly regulates osteoblast-led bone growth, which in turn increases bone formation [26]. Curiously, the results of the second research show a substantial correlation between irisin and OPG. In addition, it has been shown that irisin therapy increases OPG levels by inducing osteoblast differentiation [27]. The correlation between irisin and OPG levels found in this investigation is consistent with these results. Similarly, in research that looked at the genes that have a role in the differentiation of osteoblasts. These changes could be partially enhanced due to the long-term use of oral contraceptives at child-bearing ages [28] or low vitamin D levels [29].

Conclusion.

This study elucidates the positive correlation between serum osteoprotegerin (OPG) levels and irisin, with a correlation coefficient of R=0.175, suggesting a modest yet significant association. Osteoprotegerin, a glycoprotein involved in bone metabolism by inhibiting osteoclast differentiation and activation, has been implicated in various physiological processes beyond skeletal health. Irisin, on the other hand, is a myokine released during physical exercise that influences energy expenditure and exhibits multiple metabolic effects. The detected correlation implies that higher levels of OPG may be associated with increased levels of irisin in the bloodstream. This relationship could potentially underscore a broader regulatory mechanism were bone health indicators interplay with muscle activity markers. Given this positive correlation, future research might delve deeper into whether interventions aimed at boosting irisin through exercise or other means could indirectly benefit bone metabolism by modulating OPG levels or vice versa. Moreover, understanding this interaction could also provide insights into integrated therapeutic strategies targeting both metabolic health and skeletal integrity concurrently.

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