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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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ASSOCIATION BETWEEN SERUM LEVELS OF ADIPOKINES IN PATIENTS WITH PROSTATE CANCER

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Abstract.

Background: Adipokines were proved to be the most important mediators involved in the development and progression of several types of obesity-associated cancers. This study aims to demonstrate the relationship between adipokines and prostate cancer to evaluate the possibility of using adipokines as an early marker for diagnosis of PC and monitoring its development and progression. **Methods:** The study was conducted with a total of 82 men aged between 45 years and 76 years. The study is divided into two groups: group 1 prostate cancer (n=42) and group 2 healthy control subjects (n=40). The prostate cancer group divided into 3 subgroups according to their Gleason's grading, group 1 of low level (10) group 2 of moderate level (14) and group 3 of high level (18). **Results:** Prostate cancer patients had significantly lower levels of adiponectin (2.87±0.73ng/mL; P<0.001) than did controls (9.9±1.25ng/mL). the level of Resistin was a significantly high in prostate patient group than control group (14.65±3.43ng/mL and 10.63±1.37ng/mL), respectively, when compared to controls (11.6±1.79ng/mL), the visfatin level in patients with prostate cancer was significantly greater (20.5±4.54ng/mL) regarding the level of chemerin there was a significantly increased in patients' group (979±149.6 pg/mL) than control group (204±41pg/mL) also, the present study confirm that there is a significant correlation between the parameters serum level and PSA as well as BMI. **Conclusion:** Our findings showed that the levels of adiponectin were strongly reduced in the patients' group. other parameters were significantly higher compared with control group. Also, there are strong correlation between the levels of chemerin/ adiponectin ratio and the severity of the disease, suggesting the importance of this ratio to monitoring response to the treatment of prostate cancer, predicating the possibility of using these findings as PCa markers in early stage of disease.

Key words. Adipokines, prostate cancer, adiponectin, chemerin, resistin, visfatin.

Introduction.

The second most popular cancer in men is prostate cancer (PC) being fifth leading cause for death due to cancer [1]. Adipokines is causative linker between obesity and prostate cancer [2,3]. Adipokines are synthesized and released by prostate gland and malsecreted in obese individuals [4]. The adipokines are responsible about the mediation and conjoinment between obesity and prostate cancer robustness [5]. Evidence has supported that adipokines mediated cellular proliferation [2]. Also, adipokines could reasonably be used as a diagnostic tool for cancer [6,7]. Adipocytes are responsible about synthesis and production of this adipokines and are linked to obesity, chronic inflammation, and increased risk of a variety of malignancies, including prostate cancer [2].

The elevated level of adiponectin has been conjoined with increased risk of PC, with no robust evidence indicating direct relationship between PC and adipokines level changes [8], with modulation of adipokines being noticed at cellular and molecular levels evaluated by proteomic and genetic assay [9], newer evidence could clarify such conjoinments [2,10]. This adipokines could be utilized as a tool for diagnosis and managements [11], mainly being linked to obesity [12]. Elucidating the linke could provide helpful tool for diagnosis and prognosis directing management and preventive measures [13]. Adipokines are signaling molecules secreted by adipose tissue and have various roles in the body, including regulation of metabolism, inflammation, and immune responses [14]. Some adipokines have been implicated in cancer development and progression, including prostate cancer [2,15].

The relationship between adipokines and the severity of prostate cancer has been strongly suggested by many studies. The form of this relationship varies from one adipokine to another [2,16]. Some of them have a direct relationship with the severity of the disease, while others have an inverse relationship. Some of them are affected more than others. Therefore, in the present study we are trying to find the adipokines most closely related to the severity of the disease and the possibility of taking them as a markers through which we can early diagnosed, monitor the development of the disease and response to the treatment [17], there are several adipokines that have been studied for their potential impact on prostate cancer, include the complex interplay between adipokines, obesity, inflammation, and prostate cancer is an area of active investigation in cancer research [2]. It's important to note that while certain adipokines may be associated with prostate cancer risk or progression, the relationship is multifaceted and influenced by various factors such as genetics, lifestyle, and the tumor microenvironment [18]. The study aims to understand the association of adipokines and prostate cancer and how may contribute to prostate cancer development and progression and which one of them could be used as a targets for treatment.

Materials and Methods.

Study design: The study was approved and registered in College of Medicine, Tikrit University. A total of 82 subjects (age 38 to 69 years), attending Rizgary hospital (Kirkuk, Iraq) during first of September 2023 till the end of December 2023, were participated in this research, these subjects were 40 apparently healthy controls subjects compared to 42 prostate cancer patients, diagnosed clinically and histologically. The later were subdivided into subgroups according to severity of

cancer based on Gleason's grading system; group 1 low (less than 7), group 2 moderate (=7 mg/dl), and group 3 sever (more than 7). Informed consents were signed and collected from all participants. Blood samples were collected from fasting subjects, immediately centrifuged (3,000 rpm; 10min) and serum separated to be frozen at -20°C for future analysis. The serum was analysed for measuring adiponectine, resistin, chemrin and visfatin using the enzyme-linked immunsorbent assay (ELISA) method using kit supplied by Biosciences Company (USA). Prostate cancer subjects were further subdivided according to BMI (values ≤18.5 ≤ 25, ≤ 30, and > 30).

Statistical analysis: Data expressed as mean±SD, an unpaired student t-test was used to compare the research biochemical parameter means between the PC patient and healthy control groups using SPSS statistical analysis software (V21, USA). All P-values were two-sided, and values less than 0.05 were regarded as significant with Confidence Interval (CI) was 95%.

Results.

Analysis of samples of serum revealed that serum concentrations (ng/ml) of adiponectin in PC patients (2.9±0.7) were significantly (P=0.001) lower than the control group (9.9±1.3). The serum concentrations (pg/ml) of chemerin in PC patients (980±150) were significantly (P=0.01) higher than the control group (204±41). The serum concentrations (ng/ml) of visfatin in PC patients (20.5±4.5) were significantly (P=0.01) higher than the control group (11.6±1.8). The serum concentrations (ng/ml) of resistin in PC patients (14.7±3.4) were significantly (P=0.01) higher than the control group (10.6±1.4) (Figure 1).

When measured parameters sub-classified according to severity based on Gleason's grading, the level of adiponectin was significantly (P<0.01) higher in low grading compared to intermediate or high grading with non-significant changes exists between adiponectin level in intermediate versus high grading. Conversely, the level of chemerin were significantly (P<0.01) higher in high grading compared to intermediate or low grading with non-significant changes exists between adiponectin level in intermediate versus low grading. In the other hand, no changes between levels were noticed compared low, intermediate, or high grading regarding visfatin and resistin. Analysis of data also confirmed, strong association between the level of chemerin/adiponectin ratio and Gleason's Grading, which showed a significant increase in the level of this ratio with an increase in the severity of the disease (Table 1).

The study also showed that there is significant elevation of adiponectin, chemerin, visfatin, and resistin in overweight (>25 kg/m2) when compared levels between Body Mass Indices of normal, overweight or obese patients (Table 2).

The correlation is positive between visfatin/resistin, chemerin /resistin, and chemerin/visfatin, conversely, chemerin and adiponectin were negatively correlated (Figure 2).

Discussion.

The present study confirmed that PC associated with modulated adipokines levels represented by declined adiponectin alongside elevated chimerin, vesfatin, and resistin. Enlargement of prostate gland with advanced ageing is mainly associated imbalance of testosterone levels, hence, resulted in modulated serum adipokines. Moreover, the severity of the cancer reciprocally associated with the modulation of adipokines, represented by reduced adiponectine with increased Gleason's grading and increased chemerin/visfatin with no changes in resistin levels. Moreover, BMI has increased all adiponectin levels. The correlation is positive between visfatin/resistin, chemerin /resistin, and chemerin/visfatin, conversely, chemerin and adiponectin were negatively correlated.

The present study confirmed that adiponectin level has been reduced in PC patients, this finding harmonized with previous studies [8,19], who have confirmed reduced adiponectin levels in PC patients. Adiponectin has a role in prognosis of carcinogenesis, via triggering of the adenosine monophosphate-activated protein kinase (AMPK) thereby hindering proliferation and provoking apoptosis [19-21]. The expression of adiponectin receptors has been associated with different types of cancers alongside activation of AMPK by adiponectin reducing mTOR activation, thereby reducing protein translation and minimizing cell growth [22].

Low Gleason's grading has been associated with the highest adiponectin level, similarly Goktas et al. reported that adiponectin is low at low cancer grades and elucidated that its level being relevant to cancer progression [23]. This finding provides helpful tool for the diagnosis of the stage of the disease. The inverse association of adiponectin with cancer grade is

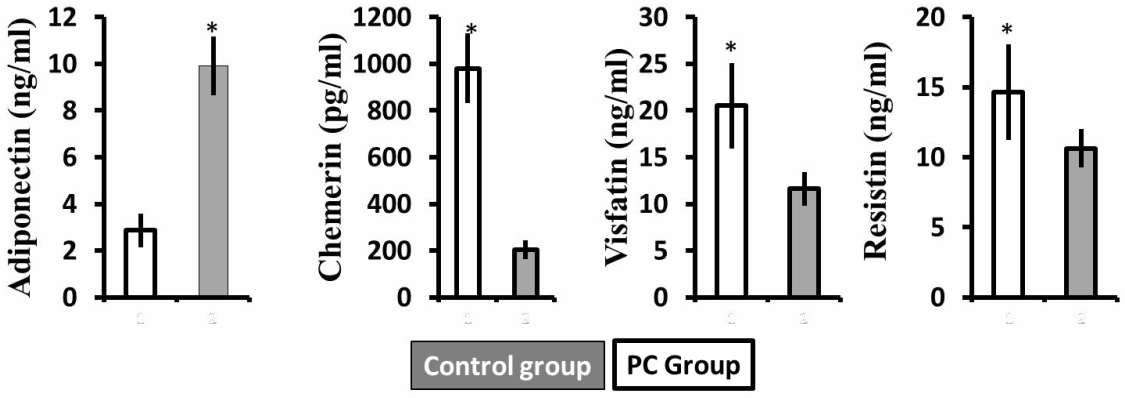

Figure 1. *Serum concentration of measured parameters (adiponectin, chemerin, visfatin, and resistin) in PC patients compared to control healthy group. Data expressed as mean±SD, *indicate significantly higher group at p value >0.05 using independent two sample t-test.*

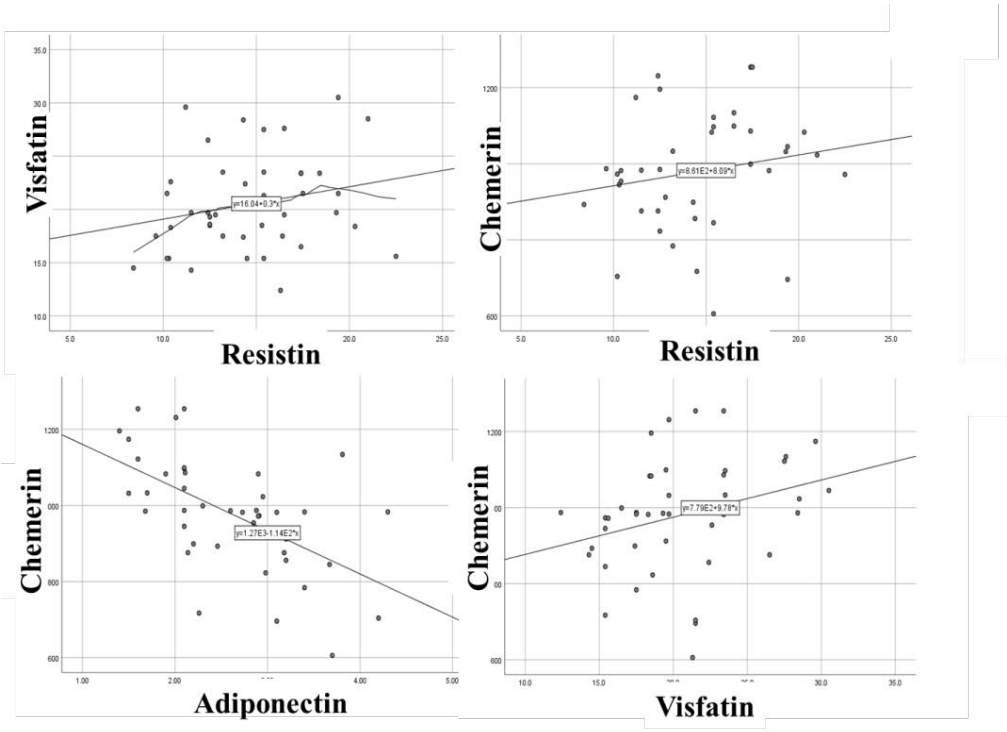

Figure 2. *The correlation between measured adipokines.*

Table 1. *Serum concentration of measured parameters (adiponectin, chemerin, visfatin, and resistin) in PC patients compared to control healthy group according to their Gleason's grading.*

Gleason's grading	n	Adiponectin	Chemerin	Visfatin	Resistin	chemerin/ adiponectin ratio
Low	10	3.5±0.46*	830±131	18.6±3	15±3.8	241±52
Intermediate	14	2.6±0.4	959±99	19.6±4.7	14±3.5	375±70
High	18	2.1±0.6	1078±115*	22.2±4.8	15±3.3	535±192*
Data expressed as mean±SD, *indicate significantly higher group at p value <0.05 using one way ANOVA and Bonferroni test. The comparison conducted between groups according to Gleason's grading						

Table 2. *Serum concentration of measured parameters (adiponectin, chemerin, visfatin, and resistin) in PC patients compared to control healthy group according to their BMI of patients.*

BMI	n	Adiponectin	Chemerin	Visfatin	Resistin
<18.5	7	2.3±0.7	878±144	17.7±2.2	13.5±2.7
18.5-24.9	10	2.5±0.5	912±125	17.7±4	13.7±3.7
25-29.9	18	3±0.56*	1045±117*	23.7±4.3*	15±3.2*
>30	7	3.8±0.57*	1029±201*	19.3±2.3*	16.4±4.5*
Data expressed as mean±SD, *significant at p value <0.05 using one way ANOVA and Bonferroni test.					

explained in physiological context, since adiponectin blocks the multiplication of myelomonocytic progenitor cell, inhibits phagocyte functions, and inhibit the tumor necrosis factor-alpha release by macrophage and thereby reduction of adiponectin level enhances cancer progression [24]. Adiponectin also suppresses neovascularization and thereby induces apoptosis [25]. The full mechanism of adiponectin anticancer effects is still obscure, but anti-apoptotic and anti-inflammatory via activation of caspase-8, caspase-9, and caspase-3—key enzymes in the apoptotic pathway [26]. Overweight associated with increased adiponectin level, this has been reviewed in earlier study [1,27], nonetheless, low grade of PC has no association with BMI [5,27].

The chemerin increased in PC in the present study and the level were increased more with severity of cancer (by Gleason's grading) and increased BMI. The serum chemerin levels were demonstrated no differences between benign and malignant prostate neoplasm, nonetheless, when sever cases or high BMI cases were compared the levels were higher in malignant cases than benign tumor [28,29], due to the role of adipose tissue cell and cancer cells in chemerin synthesis and expression [30,31].

The visfatin increased in PC in the present study and the level were increased more with severity (by Gleason's grading) of cancer and increased BMI. The serum visfatin levels were demonstrated no differences between benign and malignant neoplasms, nonetheless, when sever cases or high BMI cases

were compared the levels were higher in malignant cases than benign tumor, due to the role of adipose tissue cell and cancer cells in chemerin synthesis and expression. At the molecular level, the expression of visfatin is conjoined with the progression of the PC disease with associated tumour multiplication through ERK pathway [32].

The resistin increased in PC in the present study and the level were increased more with severity of cancer and increased BMI. The serum visfatin levels were demonstrated no differences between benign and malignant neoplasms, even when sever cases or high BMI cases were compared the levels were shown no differences in malignant cases than benign tumor [33]. These findings also observed in earlier study with more increment with recurrence of cancer [34] and decreased in advanced stages [33]. In contrast, reduced resistin levels observed in breast cancer patients [35], hyperthyroidism [36] and anorexia nervosa patients [37]. This correlation between cancer and resistin has been explained in the context of signalling pathway that potentially conjoin cancer with TLR4, PI-3 K, and NFκβ. However, PC mainly allocate the progression of cancer with resistin through AKT pathway compared to other cancer type which could be progressed through PI-3 K, NFκβ, EGFR and TLR4 expression (e.g. lung cancer) [38-40].

Conclusion.

According to the results of the current study, low serum levels of adiponectine and high serum levels of chemerin, resistin and visfatin revealed in patients with prostate cancer may have a important role as biomarkers for diagnosis of patients with prostate cancer as well as identifying individuals at high risk. Also the association between the chemerin and adiponectine, a strong correlation between the levels of chemerin/ adiponectin ratio and the severity of the disease, which shows the importance of this ratio in early diagnosis of the disease in addition to monitoring response to the treatment and perhaps being a target for future treatment of the disease. Further investigation focusing on the relation between the serum level of these parameters and prostate tissue expression may helpful the clarify the mechanism of cancer progression.

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