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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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THE ROLE OF MARKERS OF SYSTEMIC INFLAMMATORY RESPONSE IN PATHOGENESIS OF THROMBOTIC COMPLICATIONS IN MALIGNANCY

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Abstract.

Background: Patients with malignancy have higher risk of developing venous thromboembolism. The incidence among different groups of cancer patients varies considerably depending on clinical factors, the most important being tumor entity and stage. The study was approved by the local ethics committee on human research, and written informed consent was obtained from all the study participants. After written informed consent was obtained, a precise medical history was taken, with particular attention to questions about the presence of thrombotic risk factors at the onset of VTE.

Method: We retrospectively enrolled 50 patients with Venous Thromboembolism (DVT and PTE) having malignancy and 50 healthy controls from January 2020 to December 2020. DVT were diagnosed using peripheral vascular duplex ultrasonography while PTE was confirmed in all cases by computed tomography. Patients having treatment with anticoagulant therapy, recent surgery less than 8 days previously, refusal or inability to give informed consent, and inability for ascending contrast venography or inadequate results of the venographic examination were excluded from the study.

Results: Biomarkers have been specifically investigated for their capacity of predicting venous thromboembolism (VTE) during the course of disease. The relationships between inflammation markers e.g., IL-6, IL-8 and CRP as indicators of the inflammatory process and clinical venous thromboembolism need to be investigated. We investigated IL-6, IL-8 and CRP in 50 patients with venous thromboembolism having malignancy and reported that patients having venous thromboembolism have increased levels of IL-6, IL-8 and CRP (p value < 0.05).

Conclusions: Our study concluded that in cancer patients, inflammatory biomarkers play significant role in developing venous thromboembolism. This supports the hypothesis that, markers of systemic inflammatory response are involved in development of thromboembolism in patients with malignancy.

Key words. Venous thromboembolism, inflammatory biomarkers, systemic inflammatory response syndrome, malignant neoplasms.

Introduction.

Systemic inflammatory response syndrome (SIRS) is a clinical expression of host response of the body towards virulent stimuli and involves the release of acute-phase reactants, which are direct mediators of widespread autonomic, endocrine, hematological, and immunological alteration in the subject. Even though the purpose is defensive, the dysregulated cytokine storm can cause a massive inflammatory cascade leading to reversible or irreversible end-organ dysfunction and even death [1]. It is present in one-third of the indoor patients and 50 % of the patients admitted in ICU [2]. According To latest studies, chronic inflammation plays an essential role in the development and progression of malignancies [3] and it is involved in the mechanism that determine thrombus formation which is characterized by damage to the vascular walls leads to the activation of platelets, leukocytes, and endothelial cells activating the coagulation cascade [4]. Armand Trousseau first reported on the relationship between thrombosis and cancer in 1865 [5]. Since then, several studies reported that thrombosis is most common complication of malignancy and second leading cause of mortality in cancer patients [6]. Despite advancement, the association between inflammation and thrombus formation in malignancies has not yet been established. Recent studies demonstrated that the correlation between the thrombus formation and markers of system inflammatory markers i.e., CRP, IL-6, IL-8, Leukocytes exists [7]. Cancer patients have 4 to 7 times higher risk of having VTE than those without cancer. Around 20–30% of deep venous thrombosis cases occur in cancer patients [8]. Khorana et al found in the ANC Study Group Registry that cancer patients with leukocytosis had a twofold increased risk of venous thromboembolism [9]. In a subsequent, several studies observed significantly higher incidence of venous thromboembolism (3%) due to persistence of leukocytosis even after first cycle of chemotherapy. Not only leukocytosis but absolute neutrophil and absolute monocyte count also associated with greater incidence of venous thromboembolism [10]. Pro-inflammatory cytokines i.e., IL-6, IL-8 produced by various types of cells including inflammatory cells, keratinocytes, fibroblasts, and endothelial cells play their part in promoting pro-coagulant status especially by inducing TISSUE FACTOR expression and it induces several acute phase reactants including CRP [11]. However, the real connection between markers of systemic inflammatory response and thromboembolism in cancer patient is not completely understood. In this study we ought to determine the role of markers of systemic inflammatory response in thrombus formation by knowing the molecular and immune mechanisms and identifying the inflammation markers relevant for venous thrombosis to identify targets for future therapies in malignancies. Role of biomarkers in the pathophysiology of venous thromboembolism is shown below (Table 1).

Table 1. *Role of biomarkers in the pathophysiology of venous thromboembolism.*

Biomarkers	Role in the Pathophysiology of venous thromboembolism
C-Reactive protein	CRP is a non-glycosylated protein, synthesized mainly in the hepatocyte. Its production is stimulated by cytokines. It modulates innate immunity [12].
Interleukins	Released by leukocytes, endothelial cells, and other cell types that promote inflammation, they influence endothelial function, and the expression of tissue factor.IL-6 increases tissue factor production and factor VIII transcription, along with fibrinogen production [13]. IL-8induces tissue factor production and adhesion of monocytes to the endothelium, thus inducing a procoagulant surface [14].

Materials and methods.

We retrospectively enrolled 50 patients with Venous Thromboembolism (DVT and PTE) having malignancy and 50 healthy controls from January 2020 to December 2020. DVT were diagnosed using peripheral vascular duplex ultrasonography while PTE was confirmed in all cases by computed tomography. Patients having treatment with anticoagulant therapy, recent surgery less than 8 days previously, refusal or inability to give informed consent, and inability for ascending contrast venography or inadequate results of the venographic examination were excluded from the study. The study was approved by the local ethics committee on human research, and written informed consent was obtained from all the study participants. After written informed consent was obtained, a precise medical history was taken, with particular attention to questions about the presence of thrombotic risk factors at the onset of VTE. Interleukin-6 and interleukin-8 concentrations were determined with a commercially available enzyme-linked immunosorbent assay. CRP was assayed with an immunoassay on a Vitros 250.

Diagnosis of VTE.

Distal and proximal DVT were diagnosed using peripheral vascular duplex ultrasonography. Proximal DVT was defined as thrombosis at the level of the popliteal veins or above. Distal DVT was defined as thrombosis occurring within the calf veins. Duplex examinations were performed by 2 experienced vascular technicians using Mindray DC-T6 (Shenzhen, China) with a 7-MHz probe. The examination was performed with the patient in a reverse Trendelenburg position at 45o, the knees flexed, and the feet resting on a foot support. The common femoral vein, the femoral vein (proximal and middle), the great saphenous vein (proximal, middle, and distal), the popliteal vein, the short saphenous vein, the posterior and anterior tibial veins, and the peroneal and gastrocnemial veins were examined. The diagnosis of PTE was confirmed in all cases by computed tomography. The VTE was defined as idiopathic if the event occurred in the absence of a known triggering condition, such as surgery, trauma, fracture, immobilization, pregnancy, puerperium, and the use of oral contraceptive. The VTE was defined as secondary if it occurred in the presence of at least1 of the previous conditions.

Statistics.

The significance of differences in concentrations between the patients and the control subjects was tested with the Mann-Whitney test. Elevated levels of interleukin-6, interleukin-8, and CRP were defined as concentrations of more than the 90th percentile of the distribution in the control subjects. The significance of the difference in concentration during the time course was evaluated with the Mann-Whitney test for paired samples P values of less than 0.05 were considered significant.

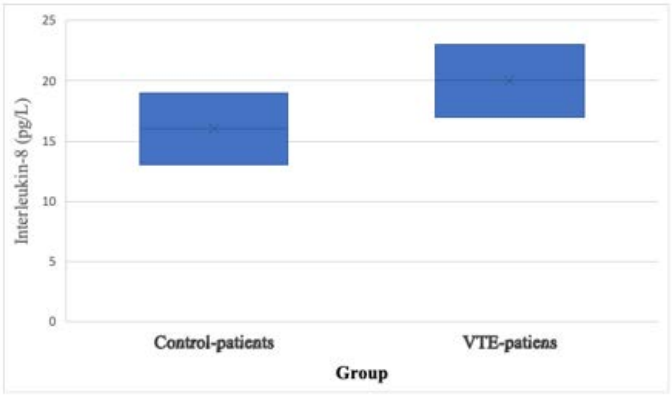

Figure 1. *Plasma levels of IL-8 in control patients and patients with Venous Thromboembolism.*

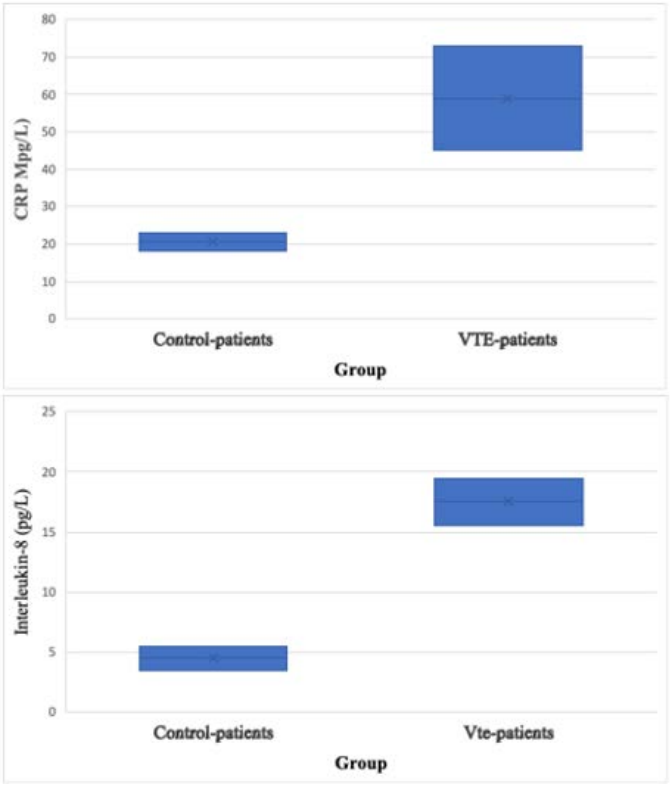

Figure 2. *Plasma levels of CRP in control patients and patients with Venous Thromboembolism.*

Results.

The median age of the patients with DVT was 53.7 years (range, 26 to 88 years) and of the control subjects was 54.0

years (range, 28 to 85 years). The median plasma concentrations of interleukin-6, interleukin-8, and CRP were higher in the patients with VTE as compared with the control subjects. In the patients with VTE, the median plasma levels of interleukin-6, interleukin-8, and CRP were 16.0 pg/mL (range, <4 to 72 pg/mL), 14.5pg/mL (range, <4 to 78 pg/mL), and 42.5 mg/L (range,<6 to 166 mg/L), respectively, and in the control subjects were less than 5 pg/mL (range, <1 to 12 pg/mL; P <.001), 9.0 pg/mL (range, <2 to 55 pg/mL; P < .001), and 8.5mg/L (range, <2 to 65mg/L; P < .001), respectively (Figures 1 and 2).

Discussion.

In patients with venous thromboembolism, this study found an apparent systemic inflammatory response with increased plasma levels of interleukin-6,interleukin-8, and CRP. The most common cause of morbidity and mortality is found to be venous thromboembolism [15]. It has been observed that low-grade inflammation results in venous thromboembolism because inflammatory markers like interleukin-6, interleukin-8, and monocyte chemo attractive protein-1 concentration were raised in patients after a thrombotic event [14]. And some studies also suggest the involvement of inflammation not only in the pathophysiology of arterial thrombosis but also, in venous thromboembolism [16,17]. According to some studies, it is evident that there is an established relationship between inflammatory status and the prothrombotic state [18]. Inflammation impedes various levels of hemostasis, by activation of coagulation or inhibition of fibrinolysis and anticoagulant pathways. Proinflammatory cytokines are the primary mediators of inflammation induced coagulation activation. Cytokines, particularly IL-6, stimulate the synthesis of acute-phase proteins, like CRP in the liver [19,20]. The role of CRP in venous thromboembolism, on the other hand, remains unknown. CRP's causative significance in development of venous thromboembolism was shown to be weak in recent studies [21]. According to population-based study, individuals with high CRP have 1.6-fold greater risk of venous thromboembolism. These results contradict the findings of two major prospective trials that found no association between blood CRP levels and the incidence of venous thromboembolism [22]. Except for elevated CRP levels at the diagnosis of venous thromboembolism, no other studies have been published on inflammatory markers in the acute phase of venous thromboembolism in patients with malignancy [23]. A study by Edith M. stated that an apparent inflammatory response with highest measured concentrations of inflammatory markers on the day of admission and a subsequent decrease during the next days. This response supports the hypothesis that elevated inflammatory markers are a result rather than a cause of venous thrombosis [16]. Although numerous studies have been done on the relationship between various inflammatory biomarkers such as IL-6, IL-8, sP-selectin, MCP1, TNFα, and CRP,4,6,17 and VTE, our study demonstrated the role of inflammatory markers in thromboembolism in patients with malignancy and observed raised concentrations of inflammatory markers in patients with venous thromboembolism.

Conclusions.

We concluded that, in the acute phase of venous thromboembolism, there is an apparent systemic inflammatory response with highest measured concentrations of inflammatory markers in patients with malignancy. This supports the hypothesis that, markers of systemic inflammatory response are involved in development of thromboembolism in patients with malignancy.

Conflict of interest statement.

The authors declared that there is no conflict of interests.

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None to declare

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Роль маркеров системного воспалительного ответа в патогенезе тромботических осложнений при злокачественных опухолях

Аннотация

Предпосылки: У пациентов со злокачественными опухолями наблюдается повышенный риск развития венозной тромбоэмболии. Уровень заболеваемости среди различных групп онкологических больных значительно варьирует в зависимости от клинических факторов, наиболее важными из которых являются тип опухоли и стадия заболевания. Исследование было одобрено местным этическим комитетом по исследованиям на людях, и от всех участников исследования было получено письменное информированное согласие. После получения письменного информированного согласия был собран точный анамнез, особое внимание уделялось вопросам о наличии факторов риска тромбозов при возникновении ВТЭ.

Метод: Мы ретроспективно включили 50 пациентов с венозной тромбоэмболией (ТГВ и ТЭЛА), имеющих злокачественные опухоли, и 50 здоровых пациентов контрольной группы с января 2020 года по декабрь 2020 года. Диагностика ТГВ проводилась с помощью дуплексного ультразвукового исследования периферических сосудов, а ТЭЛА во всех случаях подтверждалась компьютерной томографией. Из исследования были исключены пациенты, получавшие антикоагулянтную терапию, пациенты, перенесшие операцию менее 8 дней назад, отказавшиеся или неспособные дать информированное согласие, а также неспособные к проведению восходящей контрастной венографии или пациенты, у которых были неадекватные результаты венографического исследования.

Результаты: Биомаркеры были специально изучены на предмет их способности предсказывать венозную тромбоэмболию (ВТЭ) в течение болезни. Необходимо изучить взаимосвязь между маркерами воспаления, например, IL-6, IL-8 и CRP, как показателями воспалительного процесса и клинической картины венозной тромбоэмболии. Мы исследовали IL-6, IL-8 и CRP у 50 пациентов со злокачественной венозной тромбоэмболией и сообщили, что у пациентов с венозной тромбоэмболией повышен уровень IL-6, IL-8 и CRP ($p<0,05$).

Выводы: Наше исследование показало, что у онкологических больных биомаркеры воспаления играют значительную роль в развитии венозной тромбоэмболии. Это подтверждает гипотезу о том, что маркеры системного воспалительного ответа участвуют в развитии тромбоэмболии у пациентов со злокачественными опухолями.

Ключевые слова: венозная тромбоэмболия, биомаркеры воспаления, синдром системного воспалительного ответа, злокачественные новообразования.