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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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CLINICAL PREDICTORS OF BLASTOCYSTOSIS TREATMENT EFFICACY

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Abstract.

Improvement of methods and criteria for diagnostics of human blastocystosis and selection of drugs for etiotropic therapy remain urgent scientific tasks of the present day.

Clinical manifestations of blastocystosis in humans are diverse, and in this regard, their influential role on the effectiveness of blastocystosis therapy cannot be excluded.

Materials and methods: To assess the predictor properties of clinical symptoms, we retrospectively analyzed them in 300 patients with blastocystosis in alternative groups: group A − with good therapeutic effect (n = 162) and group B − with satisfactory effect (n = 138). Group A included patients who had an overall regression rate of clinical symptoms ≥ 33% after 1 month from the start of treatment and ≤ 32% in group B.

Results and discussions: Preliminary analysis showed that reliable differences between the groups were established for most clinical symptoms, which provided the basis for the development of a prognostic algorithm using a heterogeneous sequential Wald-Henkin procedure [19].

It was found that high prognostic informativity was shown by liver enlargement (J= 3,38), the presence of heaviness in the right subcostal area (J = 2,45), tachycardia (J = 1,76), decreased efficiency (J = 1,63), the degree of manifestation of clinical symptoms in general (J = 1,74), the nature of body temperature (J = 1,56), the presence of dizziness (J = 1,46) and duration of the disease (J = 1,07).

Moderate predictive properties were characterized for the patient's age (J = 0,67) and the presence of vegeto-visceral dysfunction (J = 0,96), joint pain (J = 0,87), headache (J = 0,67), heart pain (J = 0,64), and muscle pain (J = 0,53). Low prognostic informativeness was established with regard to the presence of seizures (J = 0,42), lymphoadenopathy (J = 0,33) and spleen enlargement (J = 0,30). No predictor value was found for symptoms such as abdominal pain syndrome (J = 0,09), memory impairment (J = 0,008), skin manifestations (J = 0,04), jaundice (J = 0,02), and patient gender (J = 0,01).

The testing of the predictive algorithm on the training group (n=300) established its high efficiency, as the erroneous predictions amounted to 3% and did not exceed the specified (5%; $p < 0.05$) level of reliability. Correct predictions amounted to 77% and uncertain predictions amounted to 20% of cases.

Conclusions: Using the heterogeneous sequential Wald-Genkin procedure, an algorithm was created to predict the effectiveness of therapy for patients with blastocystosis, which determined the values of the prognostic coefficients of each gradation of indicators and their general prognostic information content.

The highest prognostic informativeness was found for clinical symptoms such as liver enlargement (J = 3,38), right subcostal heaviness (J = 2,45), tachycardia (J = 1,76), degree of manifestation of clinical symptoms (J = 1,74) and body temperature (J = 1,56).

Testing the algorithm at 95% reliability level on the training group (n=300) revealed its high efficiency, as the erroneous predictions amounted to 3% and did not exceed the specified (5%; $p < 0,05$) reliability level. Correct predictions amounted to 77% and uncertain predictions amounted to 20% of cases.

Key words. Blastocystosis, clinic, effectiveness of therapy, predictors.

Introduction.

The issues of improving the diagnosis, treatment and prevention of parasitoses remain relevant for public health and health care in many countries. Human parasitic diseases are not only a medical but also a global human problem. Blastocystosis can be reasonably included among them [1-3]. There are large numbers of epidemiological studies in which Blastocystis spp. is often referred to as the most common unicellular eukaryota found in human fecal samples [1,2,4]. Indeed, its prevalence can be as high as 20% in industrialized countries, including European populations [5], and 50% in developing countries [6].

It is important to emphasize that in recent years, a lengthy scientific discussion has been completed on the feasibility of formally recognizing a separate nosological disease caused by Blastocystis sp. which is already included in the International Statistical Classification of Diseases and Related Health Problems, Eleventh Revision under the code “1A35 Blastocystosis” [7]. However, improving the methods and criteria for diagnosing blastocystosis in humans and choosing drugs for etiotropic therapy remains a pressing scientific challenge. Four major forms of Blastocystis spp. have been described at the morphological level, including the cyst infective cyst, which is able to survive for long periods of time in feces and environmental sources and is resistant to standard water chlorination, facilitating waterborne transmission of the parasite [1,8]. Thus, the fecal-oral route is considered the main route of transmission of Blastocystis spp. through consumption of food or water contaminated with cysts.

Four major forms of Blastocystis spp. have been described at the morphological level, including the cyst infective cyst, which is able to survive for long periods of time in feces

and environmental sources and is resistant to standard water chlorination, facilitating waterborne transmission of the parasite [1,8]. Thus, the fecal-oral route is considered the main route of transmission of Blastocystis spp. through consumption of food or water contaminated with cysts.

Until now, the effective treatment of human blastocystosis remains an unresolved problem because the parasite is often found in asymptomatic patients and is associated with a wide range of nonspecific symptoms, including diarrhea, abdominal pain, abdominal bloating, nausea and vomiting, and urethral lesions [1-3].

However, recent results using in vitro and in vivo approaches combined with in silico genomic data analysis and clinical reports strongly suggest the pathogenic potential of Blastocystis spp. by identifying putative virulence factors such as cysteine proteases. These proteases are secreted by the parasite and can cause epithelial barrier dysfunction [1-3,12-14].

The proposed models of pathogenesis of Blastocystis spp. [13-16] mainly involved parasite adhesion to the intestinal epithelium, apoptosis and degradation of intestinal epithelial cell tight junction proteins, resulting in increased intestinal permeability, IgA degradation and induction of pro-inflammatory cytokine response. Blastocystis spp. has also recently been linked to irritable bowel syndrome (IBS) [16,17], a multifactorial functional gut disorder partially attributed to dysbiosis [18].

All these new data indicate that the clinical manifestations of blastocystosis in humans are diverse and, as such, their influential role on the efficacy of blastocystosis therapy cannot be excluded.

The goal of the work. To determine the prognostic possibilities of clinical symptomatology data in relation to the efficacy of blastocystosis therapy and to develop a prognostic algorithm on this basis.

Materials and Methods.

To determine the predictor characteristics of clinical symptomatology, it was analyzed retrospectively in 300 patients with blastocystosis aged 15 to 54 years who received complex therapy. The degree of regression of clinical symptoms in general after 1 month from the beginning of treatment was used as a criterion of therapy efficacy.

The distribution curve of patients according to the regression index of clinical symptoms was preliminarily analyzed to justify the assignment of patients to the group with good or satisfactory effect.

It was revealed that the distribution curve is non-normal and has a double-hump character. At the same time, the mode of its first part is shifted to the extreme left and its second part to the right. The point of differentiation between these two groups of patients is the regression value of 30-31%. In this regard, the group with a good therapeutic effect included patients in whom the degree of dynamics of clinical symptoms was ≥ 31% (group A), and in the group with a satisfactory effect − ≤ 30% (group B).

The prognostic algorithm was developed using the heterogeneous sequential Wald-Genkin procedure [19], and the values of prognostic coefficients (PC) of each gradation of the index, as well as its overall prognostic informativeness (J) were determined.

The heterogeneous sequential procedure is an application of the sequential probability ratio criterion proposed by A. Wald (1947) and subsequently named (Wald's sequential analysis).

Statistical professor A. Wald proposed an original method of quality control, according to which the decision is made not at the end of experiments or observations, the number of which is determined before their beginning, but after each sample, each experience or observation. The sequential probability ratio criterion often requires 50% fewer observations than the most efficient criterion based on a fixed number of observations (A. Wald, 1947).

Wald sequential analysis has been widely used in a number of fields of mathematics and engineering, as well as biology and medicine. A.A. Genkin (1962) proposed to apply Wald sequential analysis for medical diagnostics. Later, a method for determining the diagnostic informativeness of features was proposed based on the formula for calculating the amount of information proposed by C.E. Shannon (1948) as a method for determining the diagnostic informativeness of features. Shannon (1948) as a way of ranking the signs according to their differential informativeness.

The sequential procedure, being univariate, does not require the use of sophisticated multivariate statistical methods.

It also does not require knowledge of the laws to which empirical distributions are subject and is suitable for any form of distributions. Compared to other methods, it is simple and close to medical thinking in its logical basis. Due to its similarity to medical thinking, the procedure has a learning effect, improving the quality of conventional medical diagnosis. Due to the univariate approach to constructing the feature space, the training group size requirements of the procedure are smaller than those of multivariate procedures, and the resulting distributions are more reliable.

It allows for omissions in the examination of the patient, both in the training group and in the testing and operation of the tables. (Wald A. Sequential analysis. N. Y., 1947; Shannon C.E. Mathematical theory of communication. Bell System Techn. Journ. vol. 27, p. 379-423, 623-656).

According to the procedure, the algorithm (table) is tested by algebraic summation of the table PCs in the order of decreasing predictive informativeness of the indicators until the moment of reaching the predictive threshold, which for 95% ($p < 0.05$) level of reliability is the sum of PCs greater than or equal to 13,0. If the sign (+) is near the sum of PCs, the prognosis is good, and if the sign (−) − satisfactory therapeutic effect. In the case when summing up all indicators of the table the prognostic threshold is not reached − the prognosis is uncertain.

The difference between satisfactory and good treatment results were established on the basis of retrospective analysis of the distribution curve of the degree of regression of the clinical symptomatology of the patients as a whole after 1 month from the beginning of treatment.

The distribution curve was found to be non-normal and double-humped, indicating that the sample consists of two patient populations. The mode of one of the populations is shifted to the extreme left (low degree of regression of clinical symptoms),

and the mode of the other is shifted to the extreme right (high degree of regression).

The point of differentiation of these groups of patients on the curve was the interval of regression index values 31-32%. Therefore, all patients in whom the degree of regression of clinical symptoms was between 0% and 31% were classified in the group with satisfactory, and 32% and more − in the group with good therapeutic effect.

Results and Discussions.

Data analysis showed (Table 1) that high prognostic informativeness was established for the presence of liver enlargement (J = 3,38), heaviness in the right subcostal area (J = 2,45), tachycardia (J = 1,76), decreased work capacity (J = 1,63), dizziness (J = 1,46), as well as the nature of body temperature (J = 1,56), degree of severity of clinical symptoms (J = 1,74) and duration of the course of the disease (J = 1,07).

Moderate prognostic significance was characteristic of the patient's age (J = 0,67) and the presence of vegeto-visceral dysfunction (J = 0,96), heart pain (J = 0,64), joint (J = 0,67) and muscle (J = 0,53) pain, and low prognostic informativity for the presence of seizures (J = 0,42), lymphoadenopathy (J = 0,33) and enlargement of the spleen (J = 0,30). And such symptoms as dyspepsic syndrome (J = 0,10), abdominal pain syndrome (J = 0,09), memory impairment (J = 0,08), skin manifestations (J = 0,04), jaundice (J = 0,02) and sex of the patient (J = 0,01) showed no predictive properties.

As follows from the table, in favor of a good therapeutic effect are evidenced by: pronounced (≥ 11 points) manifestation of clinical symptomatology; duration of the disease − ≥ 3,1 years; age of the patient − ≤ 20 years; presence in the patient of decreased performance throughout the day, subfebrile body temperature, dizziness at physical activity, vegeto-visceral dysfunction, pain in single or in groups of joints, pain in the heart area, headaches, muscle pain, cramps, enlargement of single peripheral lymph nodes, as well as splenomegaly.

The predictors of a satisfactory therapeutic effect are: duration of the disease up to 3 years, age of the patient − ≥ 21 years, as well as the absence of liver enlargement, heaviness in the right subcostal area, tachycardia, decreased work capacity, increased body temperature, dizziness, vegeto-visceral dysfunction, heart pain, joint pain, headaches, muscle pain, cramps, lymphoadenopathy, as well as a minor (≤ 5 points) degree of manifestation of clinical symptoms.

According to this methodology, prediction is performed by algebraic summation of PCs (Table) of the indicators in descending order of their informativeness until the moment of reaching the prognostic threshold, which for 95% level of reliability ($p<0,05$) is $\sum PC \geq 13,0$. If a sign (+) is near the sum of PCs, a good therapeutic effect is predicted, and if a sign (−) is predicted, a satisfactory therapeutic effect is predicted. If the threshold is not reached, the prognosis is uncertain.

Testing the predictive algorithm on the training group (n=300) found that correct predictions were 77%, uncertain predictions were 20%, and incorrect predictions were 3%

Conclusion.

Using the heterogeneous sequential Wald-Genkin procedure, an algorithm was created to predict the effectiveness of therapy for patients with blastocystosis, which determined the values of the prognostic coefficients of each gradation of indicators and their general prognostic information content.

The highest prognostic informativeness was found for clinical symptoms such as liver enlargement (J = 3,38), right subcostal heaviness (J = 2,45), tachycardia (J = 1,76), degree

Table 1. *Prognostic properties of clinical symptomatology of blastocystosis patients.*

Indicators	Gradations of the indicator	PC	J
hepatic enlargement	present	+3,0	3,38
	absent	−11,1	
right subcostal heaviness	present	+3,0	2,45
	absent	−7,2	
tachycardia	absent	−7,0	1,75
	during physical activity	0	
	on exertion and at rest	+5,4	
severity of clinical symptoms, scores	≤ 5	−8,0	1,74
	6-10	−0,8	
	11-15	+2,6	
	≥ 16	+3,0	
performance degradation	absent	−10,0	1,63
	by the end of the day	0	
	throughout the day	+3,0	
body temperature	normal	−6,0	1,56
	subfebrile	+2,6	
	febrile	−3,6	
dizziness	absent	−4,3	1,46
	during physical activity	+4,3	
	on exertion and at rest	−0,5	
disease duration, years	≤ 0,5	−5,9	1,07
	0,7-3,0	−0,5	
	≥ 3,1	+4,5	
vegeto-visceral dysfunction	absent	−4,6	0,96
	present	+1,8	
joint pains	absent	−3,0	0,87
	single joints	+2,3	
	group of joints	+4,2	
headaches	absent	−10,0	0,67
	during physical activity	+1,5	
	on exertion and at rest	+1,0	
patient's age, years	≤ 20	+3,8	0,67
	≥ 21	−2,0	
heart pains	absent	−1,6	0,64
	present	+3,0	
muscle pains	absent	−2,3	0,53
	during physical activity	+1,0	
	on exertion and at rest	+2,8	
cramps	absent	−2,6	0,42
	present	+2,0	
lymphoadenopathy	absent	−3,6	0,33
	single lymph nodes	+1,6	
	lymph node groups	0	
spleen enlargement	absent	−0,5	0,30
	present	+2,3	

Note: *The sign (+) indicates in favor of good, and the sign (−) − satisfactory therapeutic effect.*

of manifestation of clinical symptoms (J = 1,74) and body temperature (J = 1,56).

Testing the algorithm at 95% reliability level on the training group (n=300) revealed its high efficiency, as the erroneous predictions amounted to 3% and did not exceed the specified (5%; $p < 0,05$) reliability level. Correct predictions amounted to 77% and uncertain predictions amounted to 20% of cases.

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