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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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SEROTONIN AND AMYOTROPHIC LATERAL SCLEROSIS (ALS)

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Abstract.

Introduction: Selective degeneration of motoneurons is the pathological hallmark of amyotrophic lateral sclerosis (ALS). Does serotonin (5-HT) play a role in progression or development of disease is under the research.

Aim: The topic of the present paper is pressing as there is no data available regarding the spread of ALS. It is also noteworthy that previous studies have indicated that the pathogenesis of amyotrophic lateral sclerosis (ALS) is closely linked to 5-hydroxytryptamine (5-HT).

Materials and methods: The clinical research was conducted in Georgia . During the last five years, 60 patients from different parts of Georgia have been studied, searched, and examined by us. including from Samegrolo, Kartli, Adjara, Abkhazia, Guria, Kakheti regions. The Georgian Neurologists Corps participated and helped us in finding patients.

Brain MRI and electromyography were also performed. 60 patients with different forms of ALS participated in the study, including 34 (56.66%) men and 26 (43.33%) women. Their age ranges from 30 to 81 years. The study was conducted after obtaining the written consent of the patients, taking into account the ethical requirements for the study. we also compared the results of the serotonin level of patients with amyotrophic lateral sclerosis with a control group of 20 people (aged 18 to 50 years) who had no neurological disease in past medical history.

Results: Patients of the first group, with LMN damage, are observed with decreased amount of serotonin (61.3) %, compared to other pairs, followed by patients of the upper neuron and bulbar syndrome groups, the level of serotonin in the control group is quite high. Thus, the level of serotonin in the group of patients with bulbar events is higher than in the other groups.

Conclusions: Low serotonin requires further investigation. According to our research, the longer the anamnesis of amyotrophic lateral sclerosis patients is, the lower the level of serotonin is observed. It should also be taken into account that a low level of serotonin may be due to the presence of depression, which requires additional research.

We speculate that 5-HT could therefore be a potential therapeutic target for amyotrophic lateral sclerosis.

Key words. Serotonin, Amyotrophic lateral sclerosis (ALS), motoneuron, depression, Georgia.

Introduction.

Serotonin (5-HT) has been intimately linked with global regulation of motor behavior, local control of motoneuron excitability, functional recovery of spinal motoneurons as well as neuronal maturation and aging. Selective degeneration of motoneurons is the pathological hallmark of amyotrophic lateral sclerosis (ALS) [1-3]. Amyotrophic lateral sclerosis (ASL) is one of the heavy neurodegenerative diseases. It constitutes a progressive neuromuscular disease, first records of which have been made in medical literature in the first half of 19th century [4-10].

Contrary to the above, according to the WHO, epidemiology of the disease is based on 2016 meta-analysis results, which illustrate, that in north European countries, incidence of the disease varies at 1.92 (1.49-2.34), in southern European countries 2.22 (1.72-2.73) and in western European countries 2.35 (1.79-2.92). In USA, prevalence reaches 5.2 for 100,000 persons. Based on data as of 2014, 16 583 clinical cases were identifying in USA [11-16]. The incidence of amyotrophic lateral sclerosis is approximately two cases per 100,000 people per year. In addition, ALS has been observed to affect certain groups of people more, including football players and war veterans. However, the reasons for this phenomenon have not yet been established. Serotonin levels were determined in blood plasma, for which immunoenzymatically analysis was performed using ELISA method.

The pressing nature of the matter:

The topic of the present paper is pressing as there are no data available regarding the spread of ALS. It is also noteworthy, that previous studies have indicated that the pathogenesis of amyotrophic lateral sclerosis (ALS) is closely linked to 5-hydroxytryptamine (5-HT).

Recent studies have confirmed that serotonin stimulates the formation of new mitochondria in neurons, which leads to the synthesis of cellular ATP at the expense of reducing the demand for oxygen.

Purpose of the study.

The aim of the study was to analyze the clinical features of patients with ALS and their serotonin levels in the blood serum during and we also compared the results of the serotonin level of patients with amyotrophic lateral sclerosis with a control group of 20 people (aged 18 to 50 years) who had no neurological disease in their history.

Study design and Methods.

The clinical research was conducted in Georgia. During the last five years, 60 patients from different parts of Georgia have been studied, searched, and examined by us. including from Samegrolo, Kartli, Adjara, Abkhazia, Guria, Kakheti regions. The Georgian Neurologists Corps participated and helped us in finding patients. Brain MRI and electromyography were also performed. 60 patients with different forms of ALS participated

Table 1. *Patients by age and gender.*

	Women	Men
Among those born in 1937-1948, -9 (15%) patients	2(3.33%)	7(11.66%)
1949-1954 - 7 (11.66%)	2 (3.33%)	5 (8.33%)
1955-1965, - 33 (55%)	12 (20%)	11 (18.33%)
1966-1975, 13 (21.66%)	8 (13,33%)	5 (8,33%)
1976-1986, 5 (8,33%)	2 (3,33%)	3 (5%)
1986-1995, 2 (3,33%)	1 (1,66%)	1 (1,66%)
Among those born after 1995-1 patients	-	1 (1,66%)

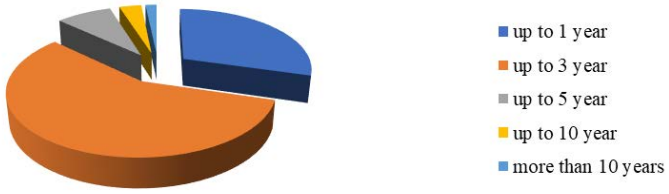

Figure 1. *History of patients with confirmed ALS.*

in the study, including 34 (56.66%) men and 26 (43.33%) women. Their age ranges from 30 to 81 years. The study was conducted after obtaining the written consent of the patients, taking into account the ethical requirements for the study.

Brain MRI and electromyography were also performed. 60 patients with different forms of ALS participated in the study, including 34 (56.66%) men and 26 (43.33%) women. Their age ranges from 30 to 81 years. Patients were included in the study according to the El Escorial criteria (Brooks B.R. et al., 2000; Ludolph A. et al., 2015) [1-4]. The control group consisted of 20 practically healthy patients.

Pedigree analysis was also performed: a pedigree was compiled using standard symbols, which includes information on the health status of the proband's relatives. As a result, relatives who are at risk of developing the disease or are carriers of the pathogenic allele have been identified. Such individuals were given appropriate genetic counseling and recommended for genetic testing. In addition, upon necessity, the risk of developing the disease for the next generation was calculated.

Statistical analysis performed with Statistical Package for Social Sciences SPSS 20.0. Baseline patient characteristics were reported using the mean (SD) for continuous variables according to their distribution. Student's T-paired test and ANOVA analysis was used to compare the means for normally distributed continuous variables. p value <0,05 was considered to be significant.

Results.

5 (8.33%) patients had confirmed diabetes mellitus, and one (1.6%) patient had a family history of athetosis. 4 (6.66%) patients had to come into contact with poisonous chemicals. 2 (3.33%) patients have a history of brain trauma, 35 patients (58.33%) are tobacco users.

- 8 (30%) patients have a one-year anamnesis of confirmed ALS disease.
- Three years old - 34 (56.66%) patients.
- 5 (8.33%) patients have a history of 5 years.
- 2 (3.33%) patients have a history of 10 years.
- One (1.66%) patient has an anamnesis of more than 10 years.

The first group consisted of patients suffering from amyotrophic lateral sclerosis with initial symptoms, including muscle weakness, fasciculations, 36 (60%), they also had pronounced muscle atrophy and atony.

The second group consisted of patients whose ALS disease (23 patients (38.33%)) started with limitation of movement of one or both legs, decrease in range and strength of movement; increase of deep reflexes and expansion of the reflexogenic zone, pathological reflexes; increase of spasticity. The third group consisted of patients whose disease started with bulbar events. ALS was diagnosed in 24 (40%) patients with speech difficulties, the patient spoke "through the nose", had difficulty swallowing, speech disorders (dysarthria, anarthria), voice production disorders (dysphonia, aphonia). Disappearance of soft palate and throat reflexes, salivation, breathing disorders were soon added to the symptoms.

Discussion.

60 patients with different forms of ALS diagnosed with amyotrophic lateral sclerosis were examined by us in Georgia over the last five years, including 34 (56.66%) men and women - 26 (43.33%) of which the most patients were from 1955-1965 33 (55%) were born, 12 women (20%), 11 men (18.33%). 5 (8.33%) patients with ALS disease in the anamnesis of our research have confirmed diabetes mellitus, 1 (1.6%) patient has a family anamnesis of athetosis. 4 (6.66%) patients had contact with poisons and chemicals, 2 (3.33%) patients have a history of brain trauma, 35 (58.33%) patients are tobacco users.

Among our patients, the most patients with a history of long-term disease have three years - 34 (56.66%), while the history of confirmed ALS disease with one year - 18 (30%) patients. 5 (8.33%) patients have a history of 5 years; 2 (3.33%) patients have an anamnesis of 10 years, one (1.66%) patient has an anamnesis of more than 10 years.

Patients of the first group, with damage to the lower motoneuron, are observed with a decreased amount of serotonin (61.3 %). Patients of the second group, with damage to the upper motoneuron, have a low level of serotonin (24.1%, $p < 0.05$). Patients of the third group with bulbar complaints have a higher level of serotonin than patients of the first group and its level reaches 2.541±0.149 μmol/L ($p < 0.01$), while the level of serotonin in the healthy group is only low in 12.1% ($p < 0$,04). Patient diagnosed with ALS had higher depression levels compared to control group, results will be presented in another manuscript, studies have proven our findings that the prevalence of depression in ALS ranges from approximately 20% to 50%, which is notably higher than in the general population.

One proposed mechanism through which serotonin may exert its neuroprotective effects in ALS is by modulating neuroinflammation. Neuroinflammation, characterized by the activation of immune cells and release of inflammatory molecules in the central nervous system, plays a crucial role in the progression of ALS. Serotonin has been shown to inhibit the activation of microglia, the primary immune cells of the central nervous system, and reduce the production of pro-inflammatory cytokines, thereby attenuating neuroinflammation

and protecting against neuronal damage in ALS. One study that investigated Potential Effects of Serotonin in the Cerebrum of SOD1 G93A Transgenic Mice, concluded that 5-HT (Serotonin) plays a protective role in ALS, likely by regulating neural stem cells in the subventricular zone that might be involved in neuron development in the piriform cortex.16 Serotonin may also promote neuroprotection by enhancing neuronal survival and function. Animal studies have demonstrated that serotonin can stimulate the production of neurotrophic factors, such as brain-derived neurotrophic factor (BDNF), which support the survival and growth of neurons. Furthermore, serotonin receptors are expressed on motor neurons, and activation of these receptors has been shown to promote neuronal survival and regeneration in experimental models of ALS.

Conclusion.

Patients of the first group, with lower motoneuron damage, are observed with decreased amount of serotonin (61.3) %, compared to other pairs, followed by patients of the upper neuron and bulbar syndrome groups, the level of serotonin in the control group is was higher.

Thus, the level of serotonin in the group of patients with bulbar events is higher than in the other groups, although both upper and lower motoneuron group patients are distinguished by the age of the disease. Low serotonin requires further investigation. According to our research, the longer the anamnesis of amyotrophic lateral sclerosis patients is, the lower the level of serotonin is observed. It should also be taken into account that a low level of serotonin may be due to the presence of depression, which requires additional research. 5-HT could therefore be a potential therapeutic target for amyotrophic lateral sclerosis. It's important to note that the role of serotonin in ALS is complex, and its effects may depend on various factors, including the stage of the disease and the specific neuronal populations involved. While some studies suggest a neuroprotective role for serotonin in ALS, others have reported conflicting findings or no significant effect. Further research is needed to fully elucidate the mechanisms underlying the potential protective effects of serotonin in ALS and to explore its therapeutic potential as a target for disease-modifying treatments.

Conflict of interest: Nothing to declare.

Authors' contribution: Conceptualization, methodology, formal analysis, investigation, resources, data curation, formal analysis-Nana Kvirkvelia, Maia Beridze, Mariam Kekenadze. Formal analysis, investigation, resources, data curation-Shorena Vashadze.

Redaction-Mariam Kekenadze.

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Серотонин и боковой амиотрофический склероз (АЛС)

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Резюме

Дегенерация мотонейронов является патологическим признаком бокового амиотрофического склероза (БАС).

Тема актуальна, поскольку данных о распространении в Грузии про БАС нет. Также примечательно, что исследования показали, что патогенез бокового амиотрофического склероза (БАС) тесно связан с 5-гидрокситриптамином (5-НТ).

Целью исследования было проанализировать клинические особенности больных БАС и уровень серотонина в сыворотке крови у них.

Материалы и методы. Клинические исследования проводились в Грузии. За последние пять лет нами были изучены, обысканы и обследованы 60 пациентов из разных уголков Грузии. в том числе из Самегроло, Картли, Аджарии, Абхазии, Гурии, Кахетии. Корпус неврологов Грузии принял участие и помог нам в поиске пациентов. Также были проведены пациентам МРТ головного мозга и электромиография. В исследовании приняли участие 60 пациентов с различными формами БАС, из них 34 (56,66%) мужчин и 26 (43,33%) женщин. Их возраст колеблется от 30 до 81 года. Исследование проводилось после получения письменного согласия пациентов с учетом этических требований к исследованию. и сравнили результаты уровня серотонина у больных боковым амиотрофическим склерозом с контрольной группой из 20 человек (в возрасте от 18 до 50 лет), не имевших заболевания в анамнезе.

Результаты У пациентов первой группы с поражением нижних мотонейронов наблюдается пониженное количество серотонина (61,3) %, по сравнению с другими парами, за ними следуют пациенты групп верхних нейронов и бульбарного синдрома, уровень серотонина в контрольной группе достаточно высок. высокий. Таким образом, уровень серотонина в группе больных с бульбарными явлениями выше, чем в остальных группах, хотя по возрасту заболевания различаются пациенты как верхней, так и нижней мотонейронной группы.

Выводы.Низкий уровень серотонина требует дальнейшего исследования. По данным наших исследований, чем длительнее анамнез больных боковым амиотрофическим склерозом, тем ниже наблюдается уровень серотонина. Также следует учитывать, что низкий уровень серотонина может быть следствием наличия депрессии, что требует дополнительных исследований.

Таким образом, 5-НТ может быть потенциальной терапевтической мишенью при боковом амиотрофическом склерозе.

КЛЮЧЕВЫЕ СЛОВА: Серотонин, Боковой амиотрофический склероз (АЛС), Мотонейрон Депрессия, Грузия.