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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 INCIDENCE OF RESISTANCE TO ANTI-TUBERCULOSIS DRUGS AMONG DIFFERENT CATEGORIES OF TUBERCULOSIS PATIENTS IN THE REPUBLIC OF AZERBAIJAN

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Abstract.

In recent years, the epidemiological situation of tuberculosis in the world has remained tense. One of the main reasons for the epidemiological tension is the rapid increase in resistance to anti-tuberculosis drugs. The status and frequency of resistance among different categories of tuberculosis patients in the Republic of Azerbaijan have been investigated. In the last three years (2021-2023), sputum and other examination materials of 11,093 tuberculosis patients in our country were sent to the "National Reference" laboratory for susceptibility testing. 40.7% of those examined are initially registered, and 59,3% are recurrent patients. Resistance to various types of drugs was detected in 20,4% of initially registered patients and 31,2% of repetitive ones. Among the examined patients, the highest frequency of Mono-H and Poly-resistance (HS, HE, HSE) was found in those who did not previously applied to anti-tuberculosis institutions – 66,9%, in initially registered patients – 38,9%, in relapses – 36,7%, in those who violated the treatment regimen – 25,1%, and the least in patients after unsuccessful treatment – 15,0%. Mono, Poly-resistance (R, RS, RE, RSE) was found in 36,9% of those who violated the treatment regimen, 36.4% after unsuccessful treatment, 35.2% in relapses, 27,8% in initially registered patients, and 10,7% among those who had not previously registered. The level of MDR was higher among those who failed treatment and violated the treatment regimen. Thus, they are 32,0% and 24,9%, respectively. The incidence of GDD forms, 16,5%, was observed most often among patients with unsuccessful treatment. One of the main reasons for the epidemiological tension is the high prevalence of broad-spectrum drug resistance among persistent forms (49,2%). The increase in resistance among relapsers and treatment defaulters (20,1% and 19,9%, respectively) is one of the main reasons for the low treatment effectiveness.

Key words. Multidrug-resistant tuberculosis, extensively drug-resistant tuberculosis, patients with primary tuberculosis, patients with recurrent tuberculosis.

Introduction.

According to the World Health Organization (WHO), the incidence of tuberculosis in the world in 2022 was 131 people per 100 thousand population [1,2]. Drug-resistant forms of tuberculosis were 17% among primary patients and 25% among those previously treated [3,4]. Despite the decrease in epidemiological indicators of tuberculosis over the years, a rapid increase in severe clinical forms, especially multi-drug-resistant (MDR) and extensively drug-resistant (XDR) forms, is observed, which is an epidemiological threat to human health worldwide [5-10].

The effectiveness of treatment of drug-resistant forms of tuberculosis is low, the duration is long, and side effects are high [11-13] simultaneously. All these cast doubt on the goal of eliminating tuberculosis by 2035, which has been considered the main goal set by the WHO at the 2018 session of the United Nations (UN) [12,14].

Although the statistics of the disease have decreased in the Republic of Azerbaijan in recent years due to the strengthening of measures to combat tuberculosis, epidemiological tension still remains [15]. Thus, while the intensive level of tuberculosis incidence per 100.000 people in 2013 was 46.9, in 2023 this figure was 26.8. Drug resistance among primary patients was 10.3% in 2013 and 12.5% in 2023. Timely detection of drug-resistant forms of tuberculosis and correct determination of treatment regimens based on resistance indicators create the basis for increasing the effectiveness of chemotherapy treatment among patients, as well as preventing new types of resistance.

Purpose of the study: To study the incidence of resistance to anti-tuberculosis drugs among primary and recurrent patients in the Republic of Azerbaijan in 2021-2023.

Materials and Methods.

The analysis of susceptibility testing among patients with pulmonary and extrapulmonary tuberculosis registered in the Republic of Azerbaijan in the last three years (2021-2023), to study of the incidence of drug resistance among tuberculosis patients of different categories; the identification of the causes of drug resistance. The study was conducted on the basis of Form No. 8 "About Tuberculosis", approved by the State Statistical Committee of the Republic of Azerbaijan. The examinations were conducted in the "National Reference" laboratory of the Scientific Research Institute of Lung Diseases (SRİLD). Each of the initial patients was sent for examination underwent GeneXpert MTB/Rif molecular-genetic examination to determine their susceptibility to Rifampicin. The research was approved at a meeting of the local ethics committee of the Scientific Research Institute of Lung Diseases (protocol No. 4 dated 11.05.2022).

The patients were also examined using the BACTEC-MGIT 960 and Levenshtein-Jensen methods in culture - liquid and solid media simultaneously. The initial patients were prescribed with an appropriate treatment regimen depending on the response to the Rifampicin test. After the response of the cultural examinations, the treatment regimens were corrected.

Results and Discussion.

In the last three years (2021-2023), 14,946 tuberculosis patients were registered in the Republic of Azerbaijan. Out of these, 7,839 were initially registered and 7,107 were re-treated patients.

During this period, 11,093 patients were culturally examined for tuberculosis mycobacteria, of which 4,516 (40,7%) were initially registered and 6,577 (59,3%) were re-treated patients (Table 1). The results of the susceptibility test among the initially registered patients in the Republic of Azerbaijan in the last three years (2021-2023) were analyzed. The results of the analysis are given in Table 1. From the analysis of Table 1, it has become clear that 7,839 primary tuberculosis patients were registered from 2021 to 2023.

Among the patients, pulmonary tuberculosis accounts for 77.8% (6096 people), and tuberculosis of extrapulmonary organs does for 22.2% (1743 people). Among the patients initially registered in the last three years, drug susceptibility was not determined in 3323 (42.4%) patients. The majority of those that have not been sent for susceptibility testing are patients with extrapulmonary tuberculosis. The test results were negative in 11 patients (0.2%).

Table 1. *Susceptibility test results among patients initially enrolled in the last three years (2021-2023).*

Years	Initial patients			Maintained susceptibility			Drug resistance			Non-susceptible			Initial patients, tested negative
	Total	Pulmonary tuberculosis	Extrapulmonary	Total	Pulmonary tuberculosis	Extrapulmonary	Total	Pulmonary tuberculosis	Extrapulmonary	Total	Pulmonary tuberculosis	Extrapulmonary	
2021	2416	1905	511	1058	987	71	242	234	8	1106	677	429	10
2022	2740	2153	587	1198	1085	113	344	309	35	1197	759	438	1
2023	2683	2038	645	1328	1202	126	335	305	30	1020	531	489	0
In total	7839	6096	1743	3584	3274	310	921	848	73	3323	1967	1356	11

Table 2. *The results of susceptibility testing among repeat patients in the last three years (2021-2023).*

Years	Repeat patients		Maintained susceptibility		Drug resistance		Negative test results		Non-susceptible	
	abs.n	%	abs.n	%	abs.n	%	abs.n	%	abs.n	%
2021	2345	33,0	1475	69,9	633	30,0	1	0,04	236	10,1
2022	2612	36,8	1492	62,0	913	37,9	1	0,04	206	7,9
2023	2150	30,2	1556	75,5	506	24,5	0	0	88	4,1
in total	7107	100	4523	68,8	2052	31,2	2	0,03	530	7,5

Table 3. *The incidence of resistance to anti-TB drugs among different categories of patients.*

Patients group	2021	2022	2023	Total
Initial patients	242	344	335	921 (100%)
Mono, Poly-resistance - H, HS, HE, HSE	80	138	140	358 (38,9%)
Mono, Poly-resistance - R, RS, RE, RSE	59	96	101	256 (27,8%)
MDR - HR, HRS, HRE, HRSE	80	81	65	226 (24,5%)
XDR - MDR MBT + Km/Am/Cm və Ofx	23	29	29	81 (8,8%)
Relapses	178	313	108	599 (100%)
Mono, Poly-resistance - H, HS, HE, HSE	56	98	66	220 (36,7%)
Mono, Poly-resistance - R, RS, RE, RSE	67	112	32	211 (35,2%)
MDR - HR, HRS, HRE, HRSE	37	69	10	116 (19,4%)
XDR - MDR MBT + Km/Am/Cm və Ofx	18	34	0	52 (8,7%)
After treatment failure	192	196	205	593 (100%)
Mono, Poly-resistance - H, HS, HE, HSE	15	41	33	89 (15,0%)
Mono, Poly-resistance - R, RS, RE, RSE	65	64	87	216 (36,4%)
MDR - HR, HRS, HRE, HRSE	74	58	58	190 (32,0%)
XDR - MDR MBT + Km/Am/Cm və Ofx	38	33	27	98 (16,5%)
Due to treatment discontinuation	213	239	166	618 (100%)
Mono, Poly-resistance - H, HS, HE, HSE	50	46	59	155 (25,1%)
Mono, Poly-resistance - R, RS, RE, RSE	77	88	63	228 (36,9%)
MDR - HR, HRS, HRE, HRSE	58	63	33	154 (24,9%)
XDR - MDR MBT + Km/Am/Cm və Ofx	28	42	11	81 (13,1%)
Others	50	165	27	242 (100%)
Mono, Poly-resistance - H, HS, HE, HSE	47	93	22	162 (66,9%)
Mono, Poly-resistance - R, RS, RE, RSE	1	22	3	26 (10,7%)
MDR - HR, HRS, HRE, HRSE	2	15	2	19 (7,8%)
XDR - MDR MBT + Km/Am/Cm və Ofx	0	35	0	35 (14,5%)

Note: *H-izoniazid, HS-izoniazid+streptomisin, HE-izoniazid+etambutol, HSE izoniazid+streptomisin+etambutol, R-rifampisin, RS-rifampisin+streptomisin, RE-rifampisin+etambutol, RSE-rifampisin+streptomisin+etambutol, MBT-mycobacterium tuberculosis.*

Among those whose susceptibility was determined, 3,584 people (79,4%) maintained their susceptibility to anti-TB drugs. Among those being sent for susceptibility testing, 921 patients (20,4%) were found to have various types of resistance to anti-TB drugs. Pulmonary tuberculosis was recorded in 2,038 people in 2023, which decreased by 5,3% compared to 2022. Tuberculosis of extrapulmonary organs increased by 9% in 2023. Among primary patients, maintenance of susceptibility was maintained in 1,328 patients (37,1%) in 2023, which increased by 20,3% compared to 2021.

The drug-resistant forms of tuberculosis amounted to 335 people in 2023, which increased by 27,8% compared to 2021. In 2023, this figure was 12,5% (335 people) (Table 2). Patients with undetermined drug sensitivity were 42,4% (3323 people), this indicator was recorded in 1020 people (38,0%) in 2023. Thus, the analysis shows that the number of tuberculosis patients decreased between 2021 and 2023, but there was an increase tendency of extrapulmonary tuberculosis. There is also an increase in the drug-resistant forms of tuberculosis.

The results of susceptibility testing among repetitive patients in the Republic of Azerbaijan over the last three years (2021-2023) were analyzed in table 2.

Due to the analysis of Table 2, it is clear that the examination materials of 530 patients (7,5%), had previously received treatment, were not sent for susceptibility testing. Among the patients whose examination materials were sent for examination, susceptibility was maintained in 68,8% (4523 people), drug resistance was observed in 31,2% (2052 people), and the results were negative in 0,03% (2 people).

In the last three years (2021-2023), out of 11093 tuberculosis patients examined in the "National Reference" laboratory of SRİLD, various types of resistance were detected in 2973 (26,8%). Out of the persistent forms, 921 are initially registered, and 2052 are repetitive patients. Out of them: - 599 patients relapsed, 593 after unsuccessful treatment, 618 after violation of the treatment regimen for various reasons, and 242 patients were previously unknown to anti-tuberculosis institutions. Examinations of patients were carried out in liquid and solid nutrient media in addition to GeneXpert MTB/Rif examination. Anti-tuberculosis treatment was not prescribed to patients, were initially registered until the results of the GeneXpert MTB/Rif examination (Table 3). Patients in other categories previously received treatment for different periods and with different treatment regimens. Susceptibility testing was previously performed on patients who relapsed, failed treatment, and violated the treatment regimen. Patients who were unknown to anti-tuberculosis institutions did not have any examination results. The incidence of resistance to anti-TB drugs among different categories of patients is shown in table 3.

Table 3 shows that among patients of different categories, Mono-H and Poly-resistance - HS, HE, HSE accounted for 33,1% (984 people), Mono-R and Poly-resistance - RS, RE, RSE did for 31,5% (937 people). 23,7% (705 people) of the examined patients had multidrug-resistant forms of tuberculosis, and 49,2% (347 people) did extensively drug-resistant forms.

As can be seen from the table, Mono, Poly-resistance (H, HS, HE, HSE) is 38,9% (358 people) among the initially registered patients, 36,7% (220 people) in relapses, 15,0% (89 people) after unsuccessful treatment, 25,1% (155 people) in those who were re-examined due to discontinuation of treatment, i.e. violation of the treatment regimen, 66,9% (162 people) in others, i.e. in those who were not previously registered in anti-tuberculosis institutions.

In the GeneXpert MTB/Rif and cultural examinations of the initially registered patients, Mono, Poly-resistance (R, RS, RE, RSE) was detected in 27,8% (256 people), 35,2% (211 people) among relapsers, 36,4% (216 people) after failed treatment, 36,9% (228 people) among those who were included in the examination after violation of the treatment regimen, 10,7% (26 people) among those who were not previously registered with the dispensary.

Multidrug resistance (MDR - HR, HRS, HRE, HRSE) was found in 24,5% (226 people) among the initially registered patients, 19,4% (116 people) among relapsers, 32,0% (190 people) among those with unsuccessful treatment results, 24,9% (154 people) among those who violated the treatment regimen, 7,8% (19 people) among those who were not previously registered with the dispensary.

Extensive drug resistance (XDR - MDR MBT + Km/Am/Cm and Ofx) was determined in 8,8% (81 people) of initially registered patients, 8,7% (52 people) of relapses, 16,5% (98 people) of unsuccessful treatment results, 13,1% (81 people) of those who violated the treatment regimen, and 14,5% (35 people) of those who were not previously registered in the dispensary.

Thus, the results of the examination show that drug resistance among initially registered patients is 20,4%, and among previously treated patients is 31,2% in the last three years (2021-2023). The highest incidence of Mono-H and Poly-resistance (HS, HE, HSE) among the examined patients is in those who have not previously applied to anti-tuberculosis institutions comprises 66,9% of patients, this form of resistance was 38,9% among patients initially registered, 36,7% among relapsers, 25,1% among those who violated the treatment regimen, and the least among patients after unsuccessful treatment – 15,0%. The reason for the high resistance in patients who did not previously applied to anti-tuberculosis institutions is the incorrect selection of treatment regimens by unqualified doctors and the incomplete course of treatment. Mono, Poly-resistance (R, RS, RE, RSE) was 36,9% among those who violated the treatment regimen, 36,4% after unsuccessful treatment, 35,2% among relapsers, 27,8% among patients initially registered, and 10,7% among those who were previously unknown to anti-tuberculosis institutions.

Since more amplification occurred in patients who violated the treatment regimen and failed treatment, the level of resistance in these patients was high. The level of multidrug resistance is also high among treatment failures and defaulters, at 32,0% and 24,9%, respectively.

Conclusion.

The incidence of extensively drug-resistant forms, being at 16,5%, was highest among patients with treatment failures. One of the main reasons for the epidemiological tension is the high prevalence of extensively drug resistance among resistant forms (49,2%). The increase in resistance among relapsers and treatment defaulters (20.1% and 19.9%, respectively) is one of the main reasons for the low treatment efficacy.

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Резюме

Частота возникновения резистентности к противотуберкулезным препаратам среди различных категорий больных туберкулезом в Азербайджанской Республике

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В последние годы эпидемиологическая ситуация по туберкулезу в мире остается напряженной. Одной из основных причин эпидемиологической напряженности является быстрый рост устойчивости к противотуберкулезным препаратам. Изучены состояние и частота встречаемости лекарственной устойчивости среди различных категорий больных туберкулезом в Азербайджанской Республике. За последние три года (2021-2023) в нашей стране в «Национальную Референс» лабораторию были направлены мокрота и другие биологические материалы 11093 больных туберкулезом для определения лекарственной чувствительности. Из числа обследованных 40,7% были первично зарегистрированными пациентами, а 59,3% — повторными пациентами. Устойчивость к различным видам лекарственных препаратов выявлена у 20,4% первично взятых на учет больных и у 31,2% повторно взятых на учет больных. Среди обследованных больных самая высокая частота моно- и поли-резистентности (HS, HE, HSE) выявлена у лиц, ранее не обращавшихся в противотуберкулезные учреждения (66,9%), у больных, первично взятых на учет (38,9%), у рецидивировавших больных (36,7%), у нарушивших режим лечения (25,1%), а самая низкая – у больных после безуспешного лечения (15,0%). Моно- и поли-резистентность (R, RS, RE, RSE) составила 36,9% у пациентов, нарушивших режим лечения, 36,4% у пациентов после безуспешного лечения, 35,2% при рецидивах, 27,8% у пациентов, первично взятых на учет, и 10,7% среди пациентов, ранее не состоявших на учете в противотуберкулезных учреждениях. Уровень МЛУ выше среди больных после безуспешного лечения и больных, нарушивших режим лечения (32,0% и 24,9% соответственно). Частота форм ШЛУ составила 16,5% и чаще всего наблюдалась среди пациентов с безуспешным лечением. Одной из основных причин эпидемиологической напряженности является высокая распространенность широкой лекарственной устойчивости среди резистентных форм (49,2%). Увеличение уровня лекарственной устойчивости среди больных с рецидивами и больных, прервавших лечение (20,1% и 19,9% соответственно), является одной из основных причин низкой эффективности лечения.

Ключевые слова: туберкулез с множественной лекарственной устойчивостью, туберкулез с широкой лекарственной устойчивостью, первичные больные, больные с рецидивом туберкулеза.