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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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ANALYSIS OF ANTIBIOTIC RESISTANCE OF CONDITIONALLY PATHOGENIC OROPHARYNGEAL MICROFLORA IN CHILDREN AFTER VIRAL RESPIRATORY INFECTIONS

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Introduction.

Today, antibiotic resistance is one of the most serious threats to human health, according to the World Health Organization (WHO). Bacterial resistance to antibiotics (antibiotic resistance, antimicrobial resistance - AMR) is growing every year. The reason for this was the excessive and uncontrolled use of antibiotics in medicine, veterinary medicine, and agriculture, as well as their entry into soil and water. According to the Expert Commission on Antibiotic Resistance (USA), the world annually uses about 73 billion single doses or 300 thousand tons of antibiotics [1,2]. Antibiotic resistance and a significant economic problem. According to the WHO, in the EU alone, the cost of treating patients with diseases caused by resistant pathogens is estimated at around 1.5 billion euros per year. The US Department of Technology estimates that the cost of managing AMR in the United States is $ 0.1-10 billion per year [3,4]. In the structure of childhood morbidity respiratory pathology is given a leading place. The average incidence in the world, according to the WHO, is about 2 cases per year per capita. Acute respiratory diseases accounts for more than 90% of human infectious diseases. Every year, people, depending on age, experience several episodes of Viral respiratory infections (VRIs): children under 3 years - 4-12, preschoolers - up to 6, schoolchildren - 3, adults - 2 times a year .VRIs accounts for more than 90% of human infectious diseases. Every year, people, depending on age, experience several episodes of VRIs: children under 3 years - 4-12, preschoolers - up to 6, schoolchildren - 3, adults - 2 times a year [5].

The etiological diagnosis of respiratory infections is rarely verified by laboratory methods, as their course is short, and it is not always advisable to conduct virological, serological or bacteriological examination to determine the cause. Use of antibacterial drugs VRIs is extremely common, both among doctors' appointments and the quality of self-medication, among people in the post-Soviet space, as antibiotics are available over the counter in pharmacies. The latter leads to the formation of secondary antibiotic resistance, in particular representatives of the opportunistic microbiota localized in the oropharynx [6].

The purpose of the study was to compare the antibiotic resistance of the oropharyngeal normoflora in children with frequent VRIs.

Materials and methods.

We investigated 33 children in 2016 and 33 children in 2021 who were treated in the Infectious Diseases Department of the Ternopil Regional Children's Clinical Hospital were investigated. In both groups, the children aged 1 to 7 years were examined (median - 4).

The obtained material from the oropharynx from the examined contingent was studied by a generally accepted microbiological method. Smears were taken with a sterile cotton swab, followed by thorough suspension in 1 ml of sterile saline. Subsequently, ten-fold dilutions were made and measured in elective and selective nutrient media, which were then incubated at the optimum temperature for 24-48 hours. Identified microbes according to Bergie's classification. In some cases, the identification was performed using a semi-automatic microbiological analyzer "Vitek-2". Determination of antibiotic susceptibility of the selected strains was performed by the method of standard disks (modified by Kirby-Bauer). The degree of dominance of a microorganism in the group was determined by the frequency of its detection. To do this, we used the constancy index C, which is expressed as the fraction of the product of the number of samples containing the test species (p) by 100% of the number of samples (P). The most common species (over 50%) were considered constant, within 20-50% - secondary, infrequent - from 1 to 20%, rare - less than 1%.

Data was collected and tabulated using Excel 2013 (Microsoft Corp., Redmond, WA, USA), qualitative data was presented as percentages and proportions and were analyzed using the statistical software (IBM SPSS Statistics 20) with the significance test p=0.05.

All studies were conducted after signing the informed consent of the parents of patients, which was approved by the Bioethics Commission of I. Horbachevsky TNMU. The research was conducted in accordance with the ethical norms and moral and legal requirements of the order of the Ministry of Health of Ukraine № 281 dated November 1, 2000.

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Results and Discussion.

In 2016, 95 strains of microorganisms, mainly aerobes and facultative anaerobes, were isolated from 33 children with VRIs. On the mucous membrane of the oropharynx persisted microbial associations, among which dominated by coccal forms of microorganisms - representatives of the genera Streptococcus, Staphylococcus.

Among the surveyed children in 2016 year were 20 (60.60%) carriers of staphylococci, with 12 children of them actually S. aureus. In 2021 were different types of streptococci were isolated from almost half (15 patient) of the subjects: α-hemolytic - 51.60%, β-hemolytic - 45.50% of patients with VRIs (Table 1).

According to the study of the structure of the oropharyngeal microbiota, the constant strains of microorganisms for this biotope are Staphylococcus spp. and Streptococcus spp., so further study of antibiotic resistance was performed on these microorganisms. With VRIs in children, antibacterial therapy is

required only in 6-8% of cases, including otitis, sinusitis, sore throat and bronchitis and pneumonia. However, the frequency of prescribing antibacterial drugs in children with VRIs significantly exceeds this figure, reaching 65-85% in outpatient practice and 98% in hospitals. At the same time, antibiotics are administered parenterally even in outpatient settings in more than 40%, and in hospitals - in 90% of cases [5]. The choice of antibacterial drugs to determine the sensitivity was dictated by the analysis of the results of the literature, indicating the most frequent use for the treatment of respiratory diseases of beta-lactam antibiotics, quinolone derivatives and macrolides [7]. The results of antibiotic sensitivity showed high activity against staphylococci and streptococci of cephalosporin and penicillin, moderate - against aminoglycosides and chloramphenicol. Almost all of the studied microorganisms were insensitive to erythromycin, which may be due to the widespread use of macrolides for the treatment of respiratory diseases and the formation of secondary resistance to them in cocci (Table 2).

Analysis of antibiotic susceptibility of staphylococci and streptococci revealed a significant reduction in the number of susceptible staphylococcal strains to cephalosporin and penicillin, which is probably due to the widespread use of cephalosporin in clinical practice and penicillin, especially oral in outpatient treatment for outpatient treatment. The results of the study showed slight changes, so the sensitivity of streptococcal strains to ceftriaxone was 41.5%, which is only 2.5% lower than five years ago (44.0%), which probably indicates a slow development of resistance to this drug. On the other hand, the number of susceptible strains of staphylococci decreased, so in 2016 it was detected 65.0%, and in 2021 - 14.3% to ceftriaxone. This may be due to parenteral administration of the drug and, accordingly, more frequent use in the hospital, where it is known to distinguish multidrug-resistant strains of staphylococci (nosocomial). At the same time, the sensitivity of streptococci to ampicillin (semi-synthetic penicillin) decreased by 69.0% (2016) and 43.0% (2021), and in staphylococci 53.95 (2016) and 28.6% (2021), respectively. The analysis of antibiotic resistance to the group of macrolides deserves special attention, because for a long time these drugs were considered the most effective against the microflora causing respiratory diseases, the so-called pneumotropic microflora, but in the last 10-15 years resistance of these microorganisms to penicillin and -2 generation and macrolide, reaching 40-80% [2]. In particular, 73.1% of isolated strains were resistant to azithromycin, and it was the least sensitive to streptococci (11.5%), which may be associated with frequent use of this tool in the case of viral-bacterial pneumonia associated with COVID-19 [8,9]. Although erythromycin is an older antibiotic, only 23.0% of streptococcal strains were resistant to it and 77.0% were intermediate. There were no strains sensitive to this antibiotic at all (Table 2), which may indicate a slower development. antibiotic resistance to erythromycin in comparison with azithromycin (sensitivity to it remained 11.5% of isolated strains of streptococci), despite the fact that both drugs belong to one group - macrolides (Figure 1).

Thus, our study suggests that streptococci - representatives of the normoflora of the oropharynx, are more resistant to azithromycin than to erythromycin, but among moderately resistant strains, erythromycin holds a huge margin, which may indicate a slower development of the drug comparable to azithromycin. The formation of antibiotic-resistant strains of bacteria is

a variety of side effects of antibiotic therapy [8]. The emergence of antibiotic-resistant bacteria can be encoded in the chromosomal apparatus or stored and transmitted by plasmids, this process is facilitated by a violation of the mode of administration of antibiotics. The formation of antibiotic-resistant strains of bacteria is a type of side effects of antibiotic therapy [9]. In particular, to macrolides, the formation of resistance occurs due to changes in antibiotic-sensitive targets - changes in the protein structure of ribosomes 70S, 50S, and 30S [10,11].

On the other hand, azithromycin penetrates well and accumulates in the tonsils, inflammatory exudate of the middle ear, bronchial secretions, bronchial mucosa lining the epithelium of the alveoli. Azithromycin was developed in 1980, and in 2011 it was an antibiotic that doctors often prescribed to patients,

Table 1. *The degree of dominance of microorganisms in the oropharynx, children with VRIs (2016, 2021).*

Microorganisms[a]	**Constancy index - C, %**	
	2016	2021
Staphylococcus spp.	60,60 %	48,5 %
Streptococcus spp. with α- hemolysis	51,60 %	60,6 %
Streptococcus spp. with β- hemolysis	45,50 %	42,4 %
Streptococcus spp. with γ- hemolysis	-	27,3 %
E.coli	45,50 %	15,2 %
Candida spp.	27,30 %	6,1 %
Neisseria spp.	15,20 %	-
Moraxella spp.	15,20 %	9,1 %
Corynebacterium spp.	9,10 %	12,1 %
Klebsiella spp.	9,10 %	-
Streptococcus pneumoniae	3,00 %	3,0 %
Branhamella spp.	3,00 %	-
Enterococcus spp.	-	6,1 %
P. aureginosa	-	3,0 %

(a) Used "The Bergey's Manual of Determinative Bacteriology" 9th Edition

Table 2. *Antibiotic sensitivity of strains of microorganisms isolated from the oropharynx, patients with VRIs (2016, 2021).*

Strain	**Antibiotic / sensitive strains, %**											
	ceftriaxone (Third generation cephalosporins)		erythromycin (macrolides)		chloramphenicol (amphenicols)		ampicillin (beta-lactams)		ofloxacin (fluoroquinolones)		penicillin (macrolides)	
	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021
Staphylococcus spp.	65.0	14.3	3.0	14.3	43.0	14.3	43.0	28.6	28.0	28.6	1.3	-
Streptococcus spp.	44.0	41.5	-	-	26.0	23.0	69.0	53.9	29.0	26.2	-	-

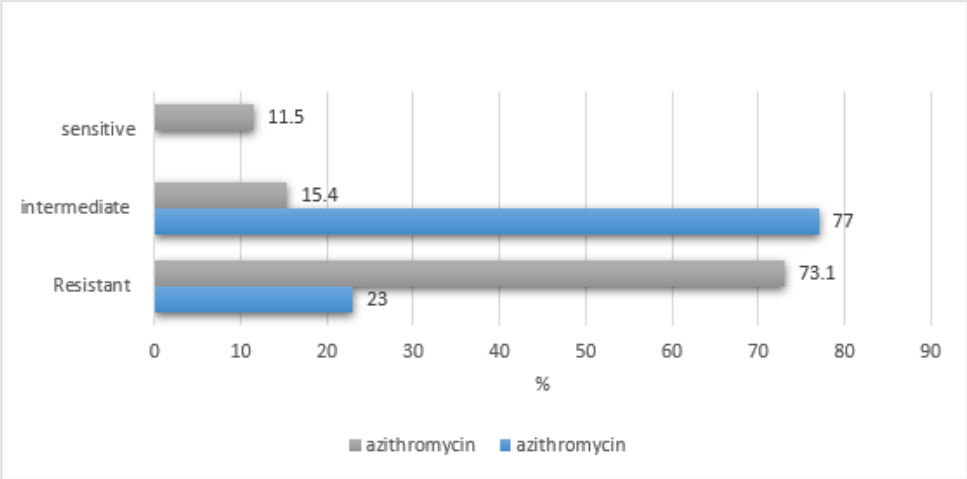

Figure.1. *Antibiotic resistance of streptococcal strains isolated from children with VRIs to macrolides.*

which apparently caused the development of resistance. That is, we are dealing with acquired secondary resistance to macrolides [12].

Also, ceftriaxone showed quite good results, sensitive strains of which were 61.5%, the formation of resistance to which is due to the destruction of the antibiotic molecule under the influence of enzymes of microorganisms [13]. Therefore, we can recommend this group of drugs for the correction of bacterial complications in respiratory infections and the use of probiotic drugs to prevent dysbiotic lesions in this habitat and in violation of the intestinal microflora[14,15].

Conclusions.

In children with VRIs, the oropharyngeal microbiota is significantly dominated by representatives of the normoflora, namely the genera Staphylococcus and Streptococcus, which necessitates the determination of their antibiotic sensitivity to antimicrobials, which are often used in the treatment of this pathology. Over the past 5 years, the number of staphylococcal strains sensitive to ceftriaxone decreased by more than 50% (65.0% in 2016 and 14.3% in 2021), to chloramphenicol by 28.7%, ampicillin by 14.4%, but the number of strains sensitive to erythromycin increased slightly (by 10%), which may be due to the lower popularity of this antibiotic at present. The number of streptococci sensitive to all groups of antibiotics decreased by 3-4% 2021 compared to 2016, only to ampicillin the number of sensitive strains decreased by 16%. Of particular note is the determination of antibiotic susceptibility of streptococci to macrolides: resistance to erythromycin develops much more slowly than to azithromycin, which may be caused by frequent use of this drug for the treatment of viral-bacterial pneumonia associated with COVID-19.

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SUMMARY

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The purpose of the was to compare the antibiotic resistance of the oropharyngeal normoflora in children with frequent Viral respiratory infections (VRIs).

Investigated were 33 children in 2016 and 33 children in 2021 who were treated in the Infectious Diseases Department of the Ternopil Regional (Ukraine) Children's Clinical Hospital. The obtained material from the oropharynx from the examined contingent was studied by a generally accepted microbiological method. Determination of antibiotic susceptibility of the selected strains was performed by the method of standard disks. Among surveyed children in 2016 year were 20 (60.60%) carriers of staphylococci, with 12 children of them actually S. aureus. In 2021 were different types of streptococci were isolated from almost half (15 patient) of the subjects: α-hemolytic - 51.60%, β-hemolytic - 45.50% of patients with VRIs and S. aureus. -48.5 %. Analysis of antibiotic susceptibility of staphylococci and streptococci revealed a significant reduction in the number of susceptible staphylococcal strains to cephalosporin and penicillin, moderate - against aminoglycosides and chloramphenicol. Almost all of the studied microorganisms were insensitive to erythromycin.

Over the past 5 years, the number of staphylococcal strains sensitive to ceftriaxone decreased by more than 50% (65.0% in 2016 and 14.3% in 2021), to chloramphenicol by 28.7%, ampicillin by 14.4%. The number of streptococci sensitive to all groups of antibiotics decreased by 3-4% 2021 compared to 2016, only to ampicillin the number of sensitive strains decreased by 16%.

Key words: Microbial associations, oropharynx, antibiotic susceptibility, viral respiratory infections (VRIs).

РЕЗЮМЕ

АНАЛИЗ АНТИБИОТИКОРЕЗИСТЕНТНОСТИ УСЛОВНО-ПАТОГЕННОЙ МИКРОФЛОРЫ РОТОГЛОТКИ У ДЕТЕЙ ПОСЛЕ ПЕРЕНЕСЕННЫХ ОСТРЫХ РЕСПИРАТОРНЫХ ЗАБОЛЕВАНИЙ

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Целью исследования являлось сравнение антибиотикорезистентности нормофлоры ротоглотки у детей с частыми вирусными респираторными инфекциями (ОР).

Обследовано 33 ребенка в 2016 году и 33 ребенка в 2021 году, которые находились на лечении в инфекционном отделении Тернопольской областной (Украина) детской клинической больницы. Полученный материал из ротоглотки от исследовали общепринятым микробиологическим методом. Определение антибиотикочувствительности выделенных штаммов проводили методом стандартных дисков. Среди обследованных детей в 2016 году было 20 (60,60%) носителей стафилококков, из них 12 детей – собственно S. aureus. В 2021 году были выделены различные виды стрептококков почти у половины (15 пациентов) обследованных: α-гемолитическое – 51,60%, β-гемолитическое – 45,50% пациентов с ВРИ и S. aureus. – 48,5%. Анализ антибиотикочувствительности стафилококков и стрептококков выявил значительное снижение количества чувствительных штаммов стафилококков к цефалоспоринам и пенициллинам, умеренное – к аминогликозидам и хлорамфениколу. Почти все изучаемые микроорганизмы были нечувствительны к эритромицину.

За последние 5 лет количество штаммов стафилококка, чувствительных к цефтриаксону, уменьшилось более чем на 50% (65,0% в 2016 году и 14,3% в 2021 году), к левомицетину на 28,7%, ампициллину на 14,4%. Количество стрептококков, чувствительных ко всем группам антибиотиков, в 2021 году уменьшилось на 3-4% по сравнению с 2016 годом, только к ампициллину количество чувствительных штаммов уменьшилось на 16%.

Ключевые слова: микробные ассоциации, ротоглотка, чувствительность к антибиотикам, вирусные респираторные инфекции