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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 ВИНТИ 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 ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებშიდან.

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. Корректур авторам не высылаются, 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 computer-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 საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ 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 შედეგების 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 ფხიხლებში 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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MEASLES IN PREGNANCY IN THE REPUBLIC OF KAZAKHSTAN: CLINICAL AND LABORATORY MANIFESTATIONS AND OUTCOMES

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Abstract.

Purpose: To study clinical and laboratory manifestations of measles in pregnant women, prognosis and outcomes of the disease in Kazakhstan (January 2023 - February 2024).

Methods: 334 medical records of women (20-43 years old) with confirmed diagnosis of measles (ELISA) were analyzed. General, biochemical blood tests and inflammatory markers were investigated.

Results:

- 20% of pregnant women were treated as inpatients and the rest as outpatients.

- A spike in hospitalizations was recorded during winter months.

- Low immunization: 48% of pregnant were unvaccinated and 52% had unknown vaccination status.

- Complications included marked intoxication, bacterial infections and perinatal disorders (miscarriages, premature births, fetal deaths).

Conclusions: Low vaccination rates and increased morbidity increase the risk of severe measles in pregnant women. Pre-pregnancy vaccination remains the only effective prevention method for mother and child.

Key words. Measles, measles in pregnant women, complications of pregnancy, vaccination, measles clinic, immunity in pregnancy, viral infections in pregnant women, measles treatment, obstetric complications, immunity in pregnancy.

Introduction.

Despite the availability of a safe and effective measles vaccine, which was developed back in 1963, there was an increase in measles cases worldwide in 2023-2024, including in the Republic of Kazakhstan. The main reason for the rise in morbidity was the decrease in childhood vaccination coverage due to the COVID-19 pandemic, which lasted for more than three years [1-3].

Measles is a highly contagious infection, caused by an RNA virus from the paramyxovirus family. Transmission of the infection occurs through airborne droplets, and measles patients pose a risk to those around them throughout the entire catarrhal period of 4 days after the rash appears. During pregnancy, due to a weakened immune system, measles can lead to serious consequences for both the mother and the fetus [4,5]. Conducted studies indicate that 60% of pregnant women require hospitalization and inpatient treatment, in 26% of cases viral and viral-bacterial pneumonia develop, and in 3% of cases the

disease results in fatal outcomes due to complications of measles. It should be noted that other complications are also diagnosed with measles: hepatitis, miscarriage, premature birth, and antenatal fetal death. Unlike the rubella virus, the measles virus does not cause congenital defects in the fetus; however, it has an increased risk of perinatal mortality and the distant development of subacute sclerosing panencephalitis. In the Republic of Kazakhstan, screening for immunity against measles is not conducted. In 2023, there was a significant increase in measles incidence, reaching 149.95 per 100,000 population, indicating a tense epidemiological situation regarding this disease [6-10].

The main reasons for the increase in morbidity were the rise in the number of susceptible individuals due to reduced vaccination coverage, late diagnosis of the infection as a result of insufficient vigilance among doctors regarding the possibility of measles developing in adults, and the presence of clinical features of its course in this category of patients [11,12].

Objective of the study.

To assess the clinical and laboratory features of measles in pregnant women, the outcomes and prognosis of the disease in the Republic of Kazakhstan during the period of epidemic instability in 2023-2024.

Materials and Methods.

We conducted a retrospective analysis of clinical, laboratory, and instrumental data, the main clinical symptoms of morbidity, and the frequency of their occurrence depending on the period and severity of measles in pregnant women.

334 medical records of pregnant and non-pregnant women of childbearing age who received treatment in infectious disease clinics and on an outpatient basis in the Republic of Kazakhstan from January 2023 to February 2024 with a verified diagnosis of measles were processed. The age of the pregnant women ranged from 20 to 43 years. In all 334 (100%) cases, the diagnosis of measles was confirmed by the results of the enzyme-linked immunosorbent assay (ELISA) (detection of IgM from day 4 to day 28 after the onset of the rash). The study included both pregnant and non-pregnant women of reproductive age to enable comparative analysis.

All pregnant women underwent studies of general and biochemical blood tests, hemostasis system indicators as needed, and inflammation markers, in accordance with the national standard for measles treatment.

On inpatient treatment daily from January 2023 to February 2024, an average of 45 to 105 pregnant women were hospitalized, which is about 20%-30%, while the remaining 70%-80% were

under the medical supervision of a general practitioner on an outpatient basis. The highest number of hospitalized patients was in November, December, and January 2023-2024 in Almaty, in the west and south of the country, and the incidence of the disease clearly correlated with the vaccination coverage.

Statistical data processing was carried out using the Statistica 6 package (StatSoft, Inc., USA). Quantitative indicators were described with the indication of the arithmetic mean and standard deviation. Differences were considered significant at $p < 0.05$.

The study was approved by the local ethical committee of «Astana Medical University», protocol №7 dated 08.01.2023y.

Results and Discussion.

The incidence of measles in 2023-2024, according to official data from the Sanitary and Epidemiological Control Committee of the Ministry of Health of the Republic of Kazakhstan, was caused by circulating imported strains of the measles virus with genotypes D8 and B3. Isolated cases of measles among pregnant women in the country began to be registered in February 2023, with the highest increase in incidence noted in October-November, followed by a gradual decline in February 2024. The improvement in the epidemiological situation regarding measles among pregnant women was parallel to the overall decrease in morbidity across the country and was associated with the implementation of additional mass immunization among vulnerable populations. Statistical analysis was performed using Statistica 6 (StatSoft, Inc., USA). Quantitative indicators were described with the arithmetic mean and standard deviation. Differences were considered significant at $p < 0.05$ (Figures 1 and 2).

A comparative analysis of clinical data and the results of laboratory-instrumental studies was conducted on 125 pregnant women who were hospitalized. From the medical history, it was established that 25 (20%) were vaccinated against measles in childhood, the frequency of vaccination could not be determined, 48 (38.4%) were not vaccinated, and the vaccination

history could not be established for 52 (41.6%) women due to incomplete medical documentation on vaccination. Contact with a measles-infected person was established in 45.4% of pregnant women, including measles infection as a result of contact with an infected child in 31.5% of cases, and the epidemiological history could not be determined in 23.1% of cases.

12% of the patients sought medical help within the first 3 days of the onset of the illness, while 88% of cases occurred on the 4th to 5th day of the illness (at the beginning of the rash period). The main group consisted of 100 pregnant women with measles, of which Group I - with moderate severity 91 (72.8%), Group II - with severe severity 9 (7.2%), and Group III - the control group of 25 (20%) non-pregnant women of fertile age with moderate severity of measles. All patients were in inpatient care.

The symptoms of the catarrhal period of measles in the comparison group were symptoms of a general infectious syndrome (fever, weakness), hyperemia of the mucous membranes of the oral cavity, oropharynx, and conjunctiva of the eyes, tearing, photophobia (Table 1).

All pregnant women showed an increase in body temperature, with the control group and moderate severity group having subfebrile levels of 37.5 ± 0.3 and 38.2 ± 0.5 , respectively, while in the severe severity group, it reached febrile levels, which were significantly higher ($p < 0.05$) compared to the control group and the moderate severity group.

In the catarrhal period of the disease, pharyngeal hyperemia was diagnosed in all patients regardless of the severity, conjunctivitis manifested with tearing and photophobia, and in cases of moderate and severe severity, it was observed in 97.8% and 100% of pregnant women, respectively. A common symptom of the catarrhal period in pregnant women was a frequent, dry, unproductive cough in moderate severity (82.4%) and severe severity (100%), as well as voice hoarseness (33.3%) and aphonia (44.4%), which were also concerning.

They were the reason for them seeking medical help. The clinic of laryngitis was observed in 21 (23%) and bronchitis

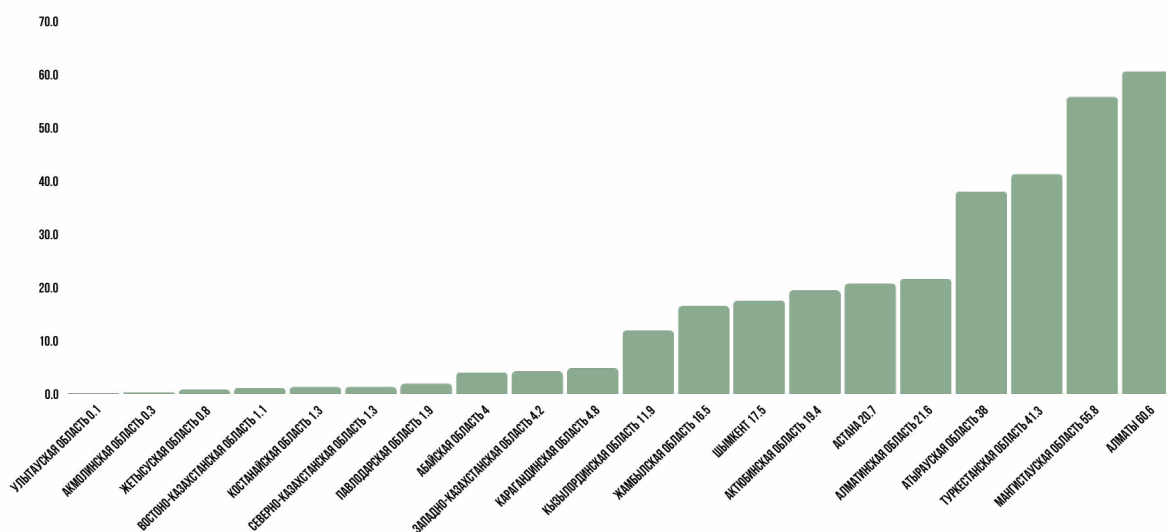


Figure 1. Regional Distribution of Pregnant Women Diagnosed with Measles in the Republic of Kazakhstan in regions with high disease incidence, such as Almaty (vaccination coverage – 74%), Mangistau (78%), Turkestan (80%), and Atyrau (82%), lower immunization levels were observed.

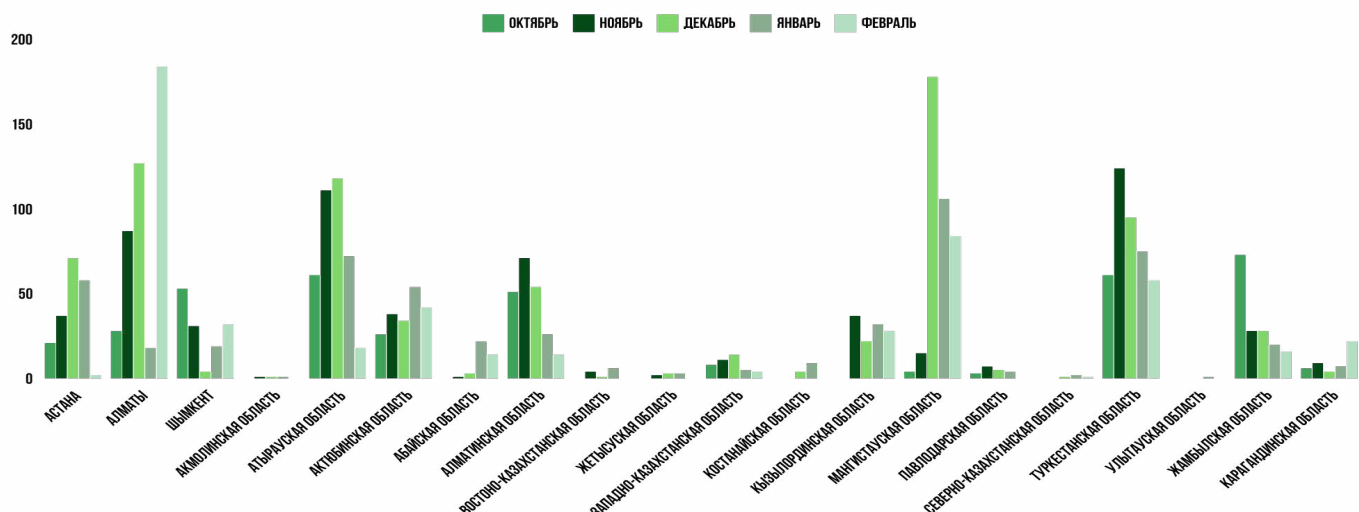


Figure 2. Monthly Distribution of Measles Cases among Pregnant Women in Different Regions.

Table 1. Clinical Data and Symptoms of Measles.

Measles Symptoms	Severity Level		
	n=25 – Control group: non-pregnant women with moderate measles Group 1 - moderate severity	n=91 (72.8%) Group 1 - moderate severity	n=9 (7.2%) Group 2 - severe severity
Increase in body temperature,	37,5 ±0,3	38,2±0,5	39,5±0,7*
Duration of fever, %	2,1±0,7	5,7±1,2	7,1±1,3
Weakness, %	16 (84,2%)	91 (100%)	9 (100%)
Hyperemia of the oropharynx	25 (100%)	91 (100%)	9 (100%)
Conjunctivitis, abs	10 (40%)	89 (97,8%)	9 (100%)
Tears, abs	10 (40%)	31 (34%)	4 (44,4%)*
Photophobia, abs	5 (20%)	19 (20,8%)	5 (55,5%)
Rhinitis, abs	9 (36%)	87 (95,6%)	9 (100%)
Hoarseness of voice, abs (%) - 19 (20.8%) 3 (33.3%)	-	19 (20,8%)	3 (33,3%)
Aphonia, abs	-	2 (2,2%)	4 (44,4%)
Dry cough, abs	2 (8%)	75 (82,4%)	9 (100%)*
Presence of Koplik spots, abs	11 (44%)	31 (34%)	4 (44,4%)
Duration of the catarrhal period, days:	3±1,2	4,1±1,4	5±1,7
Maculopapular rash, abs	15 (60%)	91 (100%)	9 (100%)
Macular rash, abs	10 (40%)	-	-
Stage of eruption	24 (96%)	91 (100%)	9 (100%)
Average duration of the rash period:	4±0,3	4,5±0,8	5,1±1,2
Presence of Koplik spots in the first 2 days of the rash:	-	8 (8,8%)	4 (44,4%)
Laryngitis, abs	-	21 (23%)	7 (77,8%)
Bronchitis, abs	-	35 (38,4%)	-
Pneumonia, abs	-	46 (50,5%)	9 (100%)
Diarrhea, abs	-	16 (17,5%)	2 (22,2%)
Diabetes, abs	-	-	2 (22,2%)
Pigmentation, abs	8 (31,5%)	54 (59,3%)	8 (88,8%)
Peeling, abs	4 (10,5%)	23 (25,2%)	2 (22,2%)
Recovery, abs	25 (100%)	44 (48,3%)	-
Improvement, abs	-	47 (51,6%)	9 (100%)
Overall duration of the disease:	7,5±0,5	11,5±1,6	15, 7±1,8

Note *- the significance of the indicator between the control group and the severe disease group p < 0.05.

Table 2. Comparative analysis of pregnancy outcomes depending on the severity and trimester of pregnancy.

Gestational Age	Total Antepartum	Fetal Death	Premature Births	Spontaneous Abortions
0-12 weeks	30			6
12-24 weeks	42	4	2	2
25 weeks and above	28	1	6	
Total	100	5 (5%)	8 (8%)	8 (8%)

in 46 (50.5%) in pregnant women with moderate severity, pneumonia in 46. (50,5). In pregnant women with severe measles, pneumonia was diagnosed in 9 (100%), with 7 (77.8%) having it in combination with laryngitis, showing signs of respiratory failure of 2-3 degrees. All were treated and cared for in the intensive care unit according to indications. The clinical presentation of measles did not differ from the control group, but it was more severe in pregnant women of the second comparison group, which was characterized by the development of complications in the form of pneumonia in 100% of cases.

During the examination of the oropharynx, Belsky-Koplik whitish spots were identified on the buccal mucosa opposite the premolars in the control group in 44%, with moderate severity in 34%, and with severe severity in 44.4%. Among those with moderate severity, 8 (8.8%) of pregnant women and among those with severe severity, 4 (44.4%) had spots that persisted during the first 2 days of the rash. In 16 (17.5%) with moderate severity and in 2 (22.2%) with severe cases, enteritis was observed (with a stool frequency of 6.5 ± 2.3 times and a duration of 4.1 ± 1.2 days) as a manifestation of measles - a pathology of the gastrointestinal tract. The duration of the catarrhal period depended on the severity of measles and ranged from 3 ± 1.2 days in the control group to 5 ± 1.7 days in the severe form of the disease (Table 1). An interesting finding was that 2 (22.2%) pregnant women with a severe course were diagnosed with diabetes mellitus with elevated glucose levels (8.51 ± 2.5); the measles virus was likely the trigger, as glucose levels were previously within the reference range.

The period of measles rash was characterized by the intensification of the catarrhal syndrome, worsening of the cough, and an increase in body temperature to febrile levels with severe severity. Pathognomonic for measles was the staged nature of the rash (day 1 on the face and neck, day 2 on the torso and shoulders, day 3 on the forearms and legs) regardless of severity, with the rash being maculopapular with a greater tendency to merge on the face and torso in moderate severity and more pronounced with individual hemorrhagic components in severe (52.6%) cases.

The regression of the rash was noted from the 4th day after its appearance in the same order, from top to bottom, and ended with pigmentation in 8 (31.5%) people in the control group and up to 8 (88.8%) in severe cases; peeling was uniformly diagnosed regardless of the severity.

The average duration of the rash ranged from 4 ± 0.3 to 5.1 ± 1.2 days. The average duration of the illness was directly dependent on the severity (Table 1), ranging from 11.5 ± 1.6 for moderate severity to 15.7 ± 1.8 for severe cases, which was higher compared to the control group by 1.5 and 2 times, respectively.

Out of the total number of pregnant women, 52.9% recovered from measles, and 47.1% were discharged from the hospital

with improvement. The cause of the severe course of the disease was complications from the bronchopulmonary system of viral-bacterial etiology, leading to respiratory failure. Lung damage was characterized by clinical and instrumental (X-ray, computed tomography) data, characteristic of focal and polysegmental pneumonia, bronchopneumonia.

Hematological and biochemical blood parameters in the control group patients were within reference values, except for the increase in C-reactive protein (20.22 ± 3.24), indicating an inflammatory process. In cases of moderate measles severity in pregnant women, a slight lymphocytosis (37.40 ± 1.33), a moderate increase in procalcitonin (5.4 ± 1.20), and a significant increase in C-reactive protein (38.97 ± 5.36) were observed, indicating pronounced inflammatory changes in the body. The severe degree of measles in all pregnant women was characterized by a complication of bacterial infection, which was confirmed by leukocytosis (15.55 ± 3.32) with a left shift (12 ± 2.03), an increase in C-reactive protein (58.8 ± 6.33) and procalcitonin (25.5 ± 2.2), and D-dimer (1389.54 ± 18.6).

A comparative analysis of pregnancy outcomes in cases of measles showed that adverse outcomes were observed in 100% of cases with a severe course of the disease, manifesting as antenatal fetal death in 5 (62.5%), spontaneous miscarriage in 1 (12.5%), and preterm birth in 2 (25%). In cases of moderate severity, preterm labor was diagnosed in 6 (46%) cases and spontaneous miscarriage in 7 (54%). Predominantly, spontaneous miscarriages occurred in the first trimester and early second trimester, while antenatal deaths and preterm births occurred in the second and third trimesters. The results of our study show that serious perinatal complications develop in each trimester of pregnancy; however, their severity depends on the gestational age. In the early stages of pregnancy, they are caused by perinatal losses: spontaneous miscarriage, antenatal fetal death; in the third trimester of pregnancy – preterm birth (Table 2).

In the treatment of measles, etiotropic antiviral treatment has not been developed, so pregnant women received symptomatic treatment—antipyretic drugs, non-steroidal anti-inflammatory drugs for elevated body temperature, respiratory oxygen support, and antibacterial drugs in case of a bacterial infection.

Conclusion.

The increase in measles cases among pregnant women in the Republic of Kazakhstan was a result of the overall rise in the number of cases among children, as well as the low vaccination rate: 48% of children were not vaccinated, and 52% had an uncertain vaccination status. This is a worrying trend that requires attention.

Measles in pregnant women progresses through the characteristic stages of this disease, including specific rashes and possible complications. Severe measles in pregnant women

can be accompanied by pronounced intoxication, abundant skin rashes, and the development of bacterial complications, especially in the bronchopulmonary system. Perinatal complications, such as spontaneous miscarriages, preterm births, and antepartum fetal deaths, can occur at any stage of pregnancy, but the severity of these complications depends on the gestational age.

The only reliable method of preventing measles remains vaccination, and it is extremely important to get vaccinated before planning a pregnancy. This will not only protect the future mother but also ensure the health of her child. The results we obtained have not only scientific value but also great practical significance, emphasizing the need for active vaccination and informing the population about the risks associated with measles.

These findings hold significant practical potential for informing public health strategies aimed at improving measles prevention and antenatal care.

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Аннотация.

Цель исследования: Изучить клинико-лабораторные проявления кори у беременных, прогнозы и исходы заболевания в Казахстане (январь 2023 – февраль 2024 гг.).

Методы: Проведён анализ 334 медицинских карт женщин (20–43 лет) с подтверждённым диагнозом кори (ИФА). Исследовались общие, биохимические анализы крови и маркеры воспаления.

Результаты:

- 20% беременных лечились стационарно, остальные амбулаторно.
- Всплеск госпитализаций зафиксирован в зимние месяцы.
- Низкая вакцинация: 48% беременных не привиты, у 52% прививочный статус неизвестен.
- Осложнения включали выраженную интоксикацию, бактериальные инфекции и перинатальные нарушения (выкидыши, преждевременные роды, гибель плода).

Выводы: Низкий уровень вакцинации и рост заболеваемости увеличивают риск тяжёлого течения кори у беременных. Вакцинация до беременности остаётся единственным эффективным методом профилактики для матери и ребёнка.

რეზიუმე.

მიზანი: ორსულ ქალებში წითელას კლინიკური და ლაბორატორიული გამოვლინებების შესწავლა, დაავადების პროგნოზი და შედეგები ყაზახეთში (2023 წლის იანვარი - 2024 წლის თებერვალი).

მეთოდები: გაანალიზდა წითელას (ELISA) დადასტურებული დიაგნოზით ქალების (20-43 წლის) 334 სამედიცინო ჩანაწერი. გამოიკვლიეს ზოგადი, ბიოქიმიური სისხლის ტესტები და ანთებითი მარკერები.

შედეგები:

- ორსულთა 20% სტაციონარში მკურნალობდა, დანარჩენი კი ამბულატორიულად.
 - ზამთრის თვეებში ჰოსპიტალიზაციის ზრდა დაფიქსირდა.
 - დაბალი იმუნიზაცია: ორსულთა 48% არ იყო ვაქცინირებული და 52% - ს ჰქონდა უცნობი ვაქცინაციის სტატუსი.
 - გართულებები მოიცავდა მკვეთრ ინტოქსიკაციას, ბაქტერიულ ინფექციებს და პერინატალურ დარღვევებს (აბორტები, ნაადრევი მშობიარობა, ნაყოფის სიკვდილი).
- დასკვნები: დაბალი ვაქცინაციის მაჩვენებლები და გაზრდილი ავადობა ზრდის ორსულ ქალებში მძიმე წითელას რისკს. ორსულობის წინა ვაქცინაცია რჩება დედისა და ბავშვის პრევენციის ერთადერთ ეფექტურ მეთოდად.

Summary.

The study was conducted under conditions of rising morbidity in the Republic of Kazakhstan in 2023–2024. The increase in the number of cases is associated with a decrease in the coverage of children vaccinated against measles, mumps, and rubella during the pandemic. The prognosis of measles in pregnant women depends on the timing of infection and is associated with an increased risk of severe perinatal complications depending on the trimester.