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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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STUDY OF THE MORBIDITY RATES OF ENDOMETRIAL HYPERPLASIA IN THE REPUBLIC OF KAZAKHSTAN FOR THE PERIOD 2012-2022

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Abstract.

Relevance: Endometrial hyperplasia (EH) is a gynecological disease characterized by pathological overgrowth of the endometrium as a result of the unhindered action of estrogens. The relevance of studying this disease is based on the morbidity rate of this disease in women in the Republic of Kazakhstan, which, in the absence of timely diagnosis, treatment and dynamic monitoring, may lead to the rapid progression to endometrial cancer (EC).

Aim of the study: To analyze the morbidity rates of EH and its histological types in the Republic of Kazakhstan for the period 2012-2022.

Materials and methods: A descriptive, retrospective epidemiological analysis of the morbidity of EH and its main histological types among the female population of the Republic of Kazakhstan for the period from January 1, 2012, to December 31, 2022, was carried out. The study used data from the Information System "Electronic Register of Inpatient Patients" for newly identified cases with histologically confirmed diagnoses according to the International Statistical Classification of Diseases and Related Health Problems, 10 WHO revision, N85.0 – Glandular endometrial hyperplasia (non-atypical endometrial hyperplasia), N85.1 – Adenomatous endometrial hyperplasia (atypical hyperplasia endometrium). Epidemiological indicators were calculated per 100,000 female population. The database formation and statistical processing of the results were carried out using Microsoft Excel and the statistical package of the SPSS Statistics 27 program.

Results: The analysis showed an increase in the morbidity of EH and its main histological types in the Republic of Kazakhstan over the period 2012-2022. It was noted that with the alignment of the dynamic range indicators, the morbidity of EH increased by an average of 13.7% annually. During the analyzed period, the average annual morbidity of EH was 4.59±0.81 cases per 100,000 female population (95% CI=2.77-6.40), atypical EH - 4.32±0.78 (95% CI=2.61-6.04), atypical GE - 0.26±0.59 (95% CI=0.13-0.39), respectively. The main trends of changes in the morbidity of EH in the context of regions have been identified. It was found that the peak morbidity of EH and its main histological types occurred in the age group of 45-49 years.

Conclusion: The identified trends in the morbidity of EH and its histological types in the population of the Republic of Kazakhstan have shown the need for a more detailed study of risk factors contributing to the development of EH and the improvement of healthcare services.

Key words. Endometrial hyperplasia, morbidity, atypical endometrial hyperplasia, prevention, perimenopause.

Introduction.

Endometrial hyperplasia (EH) is a pathology of uterus characterized by morphological changes in the endometrium, leading to an increase in the ratio of endometrial glands to stroma compared with normal endometrium [1]. The World Health Organization (WHO, 2014) identifies two histological types of EH depending on the presence or absence of cytologic atypia: non-atypical endometrial hyperplasia (NAEH) and atypical endometrial hyperplasia (AEH) [2]. The morbidity of EH increases with age, and the overall morbidity is 133 per 100,000 female years [3]. However, the morbidity rates may exceed these figures, as there are undiagnosed asymptomatic cases of EH [4]. This pathology is rare in women under 30 years of age and reaches its peak in women in the age group of 50-54 years [3]. The clinical significance of EH is that, if left untreated, it can rapidly progress to endometrial cancer (EC) [5]. The risk of progression of NAEH into EC is 5%, while of AEH - 28% [6]. In addition, in 50% of cases, AEH can coexist with EC [7]. According to the World Cancer Research Fund, EC ranks 6th among all female malignant diseases in the world. In 2022, more than 420,000 new cases of EC and 90,000 deaths were registered [8]. Over the past 30 years, the overall morbidity of EC has increased by 132%, which is associated with an increase in risk factors contributing to the degeneration of EH into EC, such as early menarche, no childbirth in history, late menopause, hormone replacement therapy (HRT), polycystic ovarian syndrome, diabetes and obesity [9, 10]. It is predicted that in the next few decades, due to the increase in obesity, the morbidity of EC will increase to epidemic level [11]. EC usually occurs after menopause, 14% of cases occur in premenopausal women, 5% of cases are diagnosed in women between the ages of 35 and 44, and 2% occur in women between the ages of 20 and 24 [12].

According to the latest data from the statistical and analytical collection "Indicators of the Oncology Service of the Republic of Kazakhstan", EC ranks 3rd among all oncological diseases of the female genital organs [13]. Unfortunately, accurate data on the incidence of EH are not available in Kazakhstan. Therefore, the study of the morbidity of EH and its histological types in our country is relevant for determining the target risk group of the population, obtaining evidence in order to further develop control and prevention strategies that help reduce the risks of

EH degeneration into EC.

Objective.

To analyze the morbidity rates of EH and its histological types in the Republic of Kazakhstan for the period 2012-2022.

Materials and Methods.

Data sources:

The study used data from the Information System "Electronic Register of Inpatient Patients" ("ERIP") for newly identified cases with histologically confirmed diagnoses according to the International Statistical Classification of Diseases and Related Health Problems, 10 WHO revision, N85.0 – Glandular endometrial hyperplasia (non-atypical endometrial hyperplasia), N85.1 – Adenomatous endometrial hyperplasia (atypical hyperplasia endometrium) for the period from January 1, 2012 to December 31, 2022. "ERIP" is the official leading center for the management and enforcement of a unified methodology and technology for the formation of medical databases in the healthcare system, approved by the authorized body in the field of healthcare of the Republic of Kazakhstan.

Data on the female population for 2012-2022, necessary for calculating the morbidity of EH and its histological types, were taken from the official website of the National Bureau of Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan [14].

Calculation and analysis of morbidity rates.

The morbidity rate of EH and its histological types were calculated in the whole country, regions and age groups of the female population. The Republic of Kazakhstan is administratively divided into 17 regions and 3 cities of republican significance [15]. The age groups were classified into 10 categories (under 29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70 and older). The number of cases by country, region, and age group was divided by the total female population, and then multiplied by 100,000, in order to calculate the morbidity rates. Special dynamic series methods were used to analyze changes in the intensive morbidity rates of EH over a certain period of time in the country. The indicators of absolute increase, increase coefficient, growth rate and increase rate were calculated. To analyze the dynamic series indicators, a trend (alignment of the dynamic series data) was calculated in order to obtain correct conclusions about the underlying development patterns and eliminate the influence of random factors. To align the indicators of the dynamic series (trends), the analytical method of least squares was used, which was calculated using the equation [16]:

$y = a0 + a1 \times X$

Where y - is the theoretical (calculated) levels of the series for each period; a0 – the initial level; a1 – the initial rate of the series; X - time points, natural numbers, placed from the middle (center) of the series to both ends.

For a generalized quantitative assessment of trends in the dynamic series, an indicator called the average rate of increase (decrease) "T incr.decr.", expressed in %, was used. When calculating it, the following formula can be used for most series [16]:

$$Tincr. = \frac{a1 * K}{a0} \times 100\%$$

Where K = 1 for an odd number of levels of the series; K = 2 for an even number of levels of the series.

a0 and a1 - linear dependence indicators used in the alignment of the series by the least squares method.

Database formation and statistical data processing were carried out using the Microsoft Excel software package. A linear graph was used to display trends in the morbidity of EH, and a table was used for changes in the morbidity rates of the dynamic range of EH. The morbidity of EH by region and age group was illustrated using a bar graph. The statistical package of the SPSS Statistics 27 program was used to calculate the average annual crude rate (M), average error (m), 95% confidence interval (95% CI) of EH and its histological types in general, in regions and age groups. The study was approved by the Ethics Committee of the Kazakhstan Medical University "KSPH" (Minutes No. IRB-335 dated 05.01.2023).

Results.

The trend in morbidity of EH in the Republic of Kazakhstan for 2012-2022.

Figure 1 shows the dynamics of the morbidity of EH in the female population of the Republic of Kazakhstan for 2012-2022. There was an increase in the morbidity rates of EH from 0.09 cases in 2012 to 6.60 cases per 100,000 female population in 2022. The analysis of the morbidity of EH in the female population of the Republic of Kazakhstan showed that there was a sharp increase in the indicator from 0.09 to 6.27 cases per 100,000 female population in 2012-2016. The peak morbidity was recorded in 2017 and amounted to 7.46 cases per 100,000 female population. In the next three years (2018-2020), the rate decreased to 5.21 cases per 100,000 female population. However, in 2021, the indicator increased again to 5.73 cases, followed by a 1.15-fold increase in 2022 (6.60 cases per 100,000 female population). The average annual morbidity of EH during the analyzed period was 4.59±0.81 cases (95% CI=2.77-6.40).

As shown in Table 1, the rate of change in morbidity rates varied over time, with the largest absolute increase recorded in 2015, and the highest increase coefficient, growth rate and increase rate in 2013. Despite the fluctuating morbidity rates of EH, with the alignment of the dynamic range indicators, there is a tendency of increase in the morbidity rates by an average of 13.7% annually.

The trend in morbidity of histological types of EH in the Republic of Kazakhstan for 2012-2022.

Table 2 shows the dynamics of morbidity of histological types of EH in female population of the Republic of Kazakhstan, where there was an increase in both NAEH from 0.08 in 2012 to 5.18 cases in 2022, and AEH - from 0.01 in 2012 to 0.56 cases in 2022. During the analyzed period, the average annual morbidity of NAEH was 4.32±0.78 (95% CI=2.61-6.04), AEH - 0.26±0.59 (95% CI=0.13-0.39) cases per 100,000 female population.

The trend in morbidity of EH by the regions of the Republic of Kazakhstan for 2012-2022.

Figure 2 shows the average annual morbidity rates of EH in the

Table 1. *Morbidity rates of EH in female population of the Republic of Kazakhstan in 2012-2022.*

Year	Incidence of EH per 100,000 female population	Absolute increase	Coefficient rate	Growth rate, %	Increase rate, %
2012	0,09				
2013	0,38	0,28	4,07	406,88	306,88
2014	1,53	1,16	4,06	406,32	306,32
2015	4,02	2,49	2,62	262,44	162,44
2016	6,27	2,25	1,56	155,84	55,84
2017	7,46	1,19	1,19	119,04	19,04
2018	7,23	-0,23	0,97	96,90	-3,10
2019	5,93	-1,30	0,82	81,99	-18,01
2020	5,21	-0,72	0,88	87,90	-12,10
2021	5,73	0,52	1,10	110,01	10,01
2022	6,60	0,87	1,15	115,11	15,11

Table 2. *Dynamics n morbidity of histological types of EH in female population of the Republic of Kazakhstan for 2012-2022.*

Year	Incidence of NAEH per 100,000 female population	Incidence of AEH per 100,000 female population	Incidence of EH per 100,000 female population
2012	0,08	0,01	0,09
2013	0,37	0,01	0,38
2014	1,50	0,03	1,53
2015	3,87	0,16	4,02
2016	5,99	0,27	6,27
2017	7,16	0,30	7,46
2018	6,99	0,23	7,23
2019	5,56	0,37	5,93
2020	4,80	0,41	5,21
2021	5,18	0,56	5,73
2022	6,06	0,54	6,60
Average annual morbidity rate, * M ± m (95%CI)	4,32±0,78 (2,61-6,04)	0,26±0,59 (0,13-0,39)	4,59±0,81 (2,77-6,40)

Note: **M - the average annual morbidity rate, *m - the average error, *95% CI - confidence interval.*

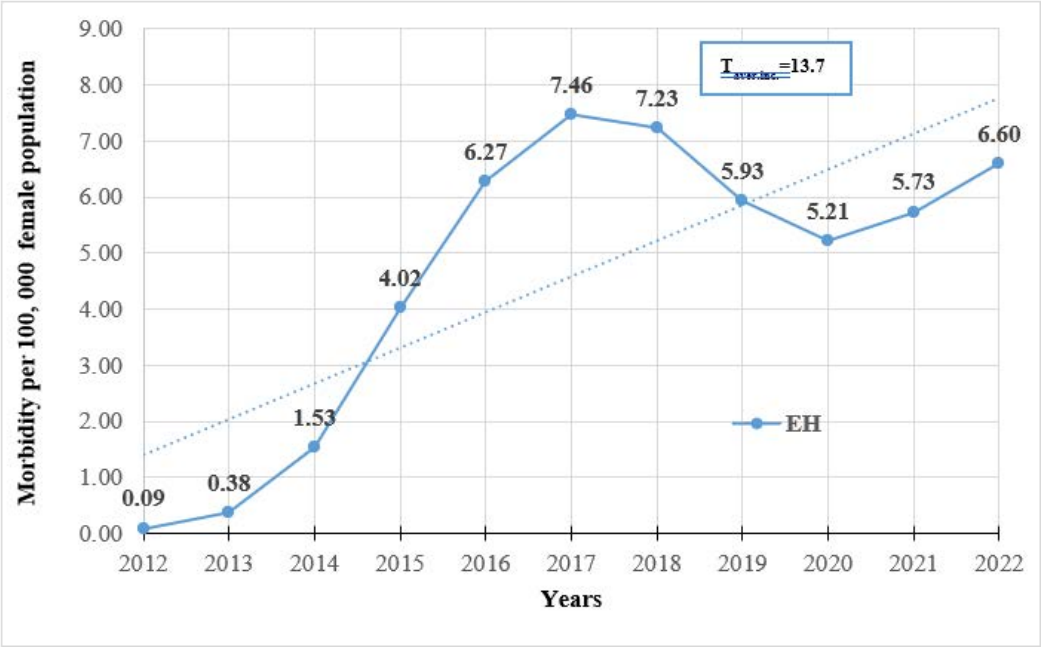

Figure 1. *The morbidity of EH and its histological types in the Republic of Kazakhstan for the period 2012-2022 (per 100,000 female population).*

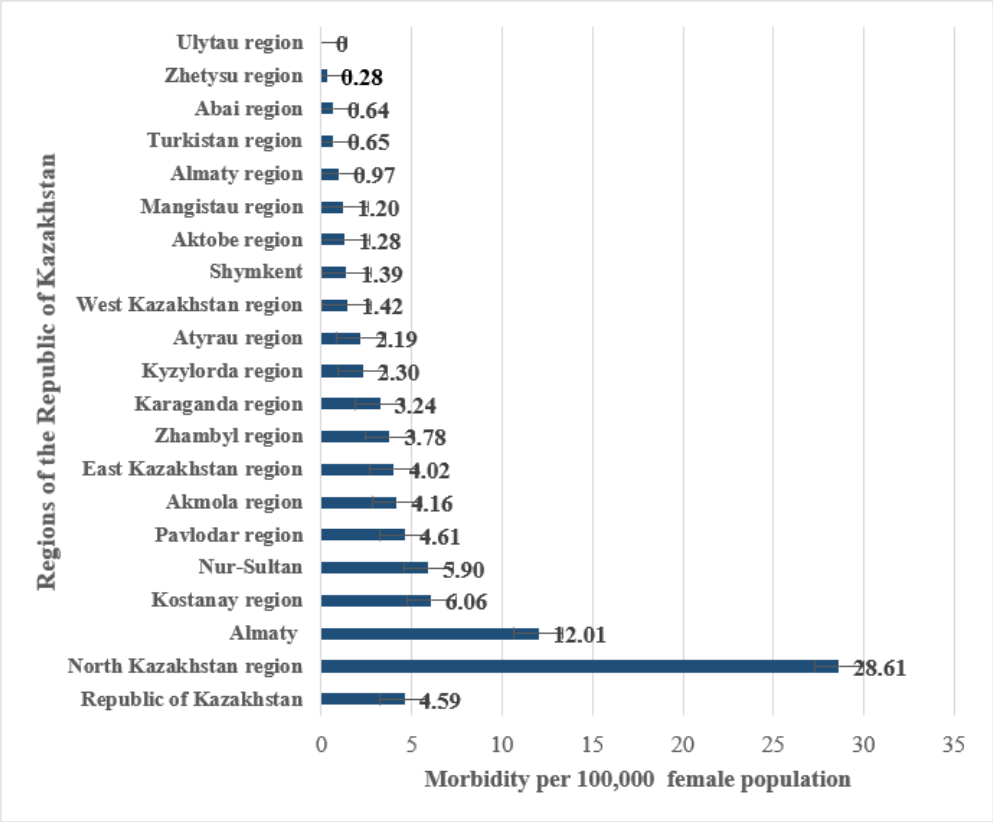

Figure 2. *The morbidity of EH in the regions of the Republic of Kazakhstan for the period 2012-2022 (per 100,000 female population).*

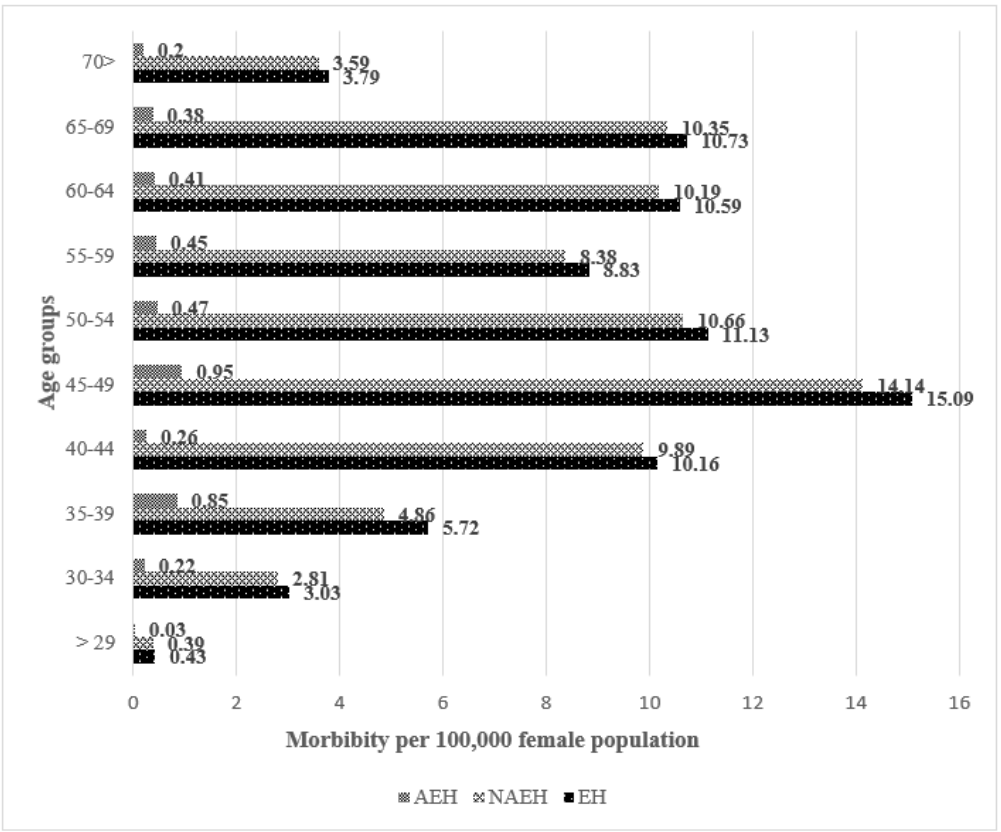

Figure 3. *The average annual morbidity of EH and its histological types in the age groups of women in the Republic of Kazakhstan for 2012-2022 (per 100,000 female population).*

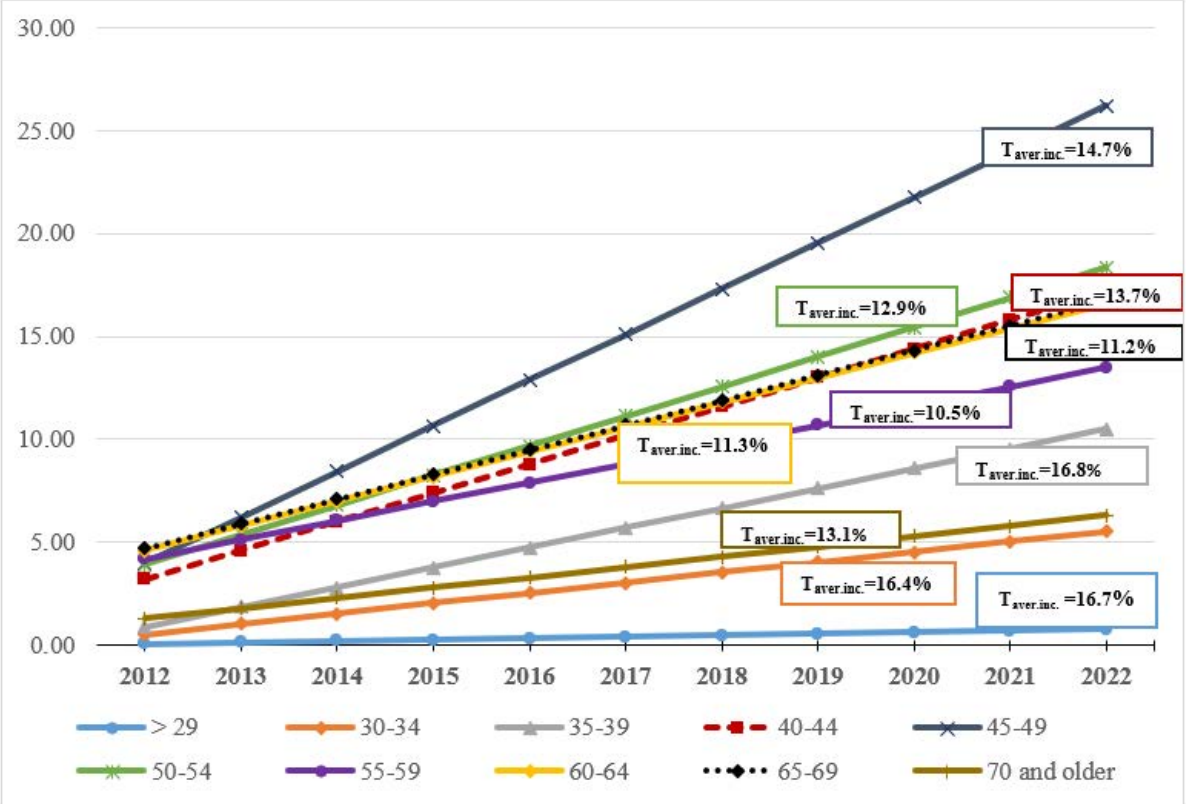

Figure 4. *Trends in the equalized morbidity rates of EH in the age groups of women in the Republic of Kazakhstan for 2012-2022 (per 100,000 female population).*

regions of the Republic of Kazakhstan from 2012 to 2022. It is noted that the highest morbidity rates are observed in 3 regions: North Kazakhstan region (28.61 cases), Kostanay region (6.06 cases), Pavlodar region (4.61 cases); and in 2 cities of republican significance: Almaty (12.01 cases) and Nur-Sultan (5.9 cases). The lowest morbidity rates are observed in Turkistan region (0.65), Abai region (0.64), Zhetysu region (0.28).

The trend in morbidity of EH and its histological types among the age groups of the female population of the Republic of Kazakhstan in 2012-2022.

The distribution of the average annual morbidity rates of EH and its histological types are shown in Figure 3. According to the analysis, it was revealed that the peak morbidity of EH and its histological types occurred in the age group of 45-49 years (15.09 cases), where the main increase was due to an increase in the incidence of NAEH (14.14 cases), while the incidence of AEH in this age group was 0.95 cases per 100,000 female population. It should be noted that women in the age category of 50-54 years (10.66 cases), 65-69 years (10.35 cases), and 60-64 years (10.19 cases) were more susceptible to NAEH. On the contrary, women in the age groups 35-39 years (0.85 cases), 50-54 years (0.47 cases), and 55-59 years (0.45 cases) were more susceptible to AEH. The lowest morbidity rates of both NAEH and AEH were observed in the group of 29 years and younger, which amounted to 0.39 cases and 0.03 cases, respectively.

Figure 4 shows trends in the equalized morbidity rates of EH by age group. Despite the different distributions of average annual morbidity levels, the balanced data of the dynamic series showed an increase in morbidity in all age groups of the female population of our country over the analyzed period (2012-2022). The highest average rate of increase in the morbidity of EH was observed in the age group of 35-39 years ($T_{aver.inc..}$=16.8%), and the lowest rate is in the group of 55-59 years ($T_{aver.inc..}$=10.5%).

Note: * To align the indicators of the dynamic series (trends), the analytical method of least squares was used, which was calculated using the equation [21]:

$y = a0 + a1 \times X$

where y is the theoretical (calculated) levels of the series for each period.

a0 - the arithmetic mean of the level of the series, calculated using the formula:

$$a0 = \frac{\Sigma\, y\ actual}{n}$$

a1 - a direct coefficient showing the difference between the theoretical levels of the series for adjacent periods, determined by calculating using the formula:

$$a1 = \frac{\Sigma\, xy\ actual}{\Sigma\, x^2}$$

where n - the number of levels of the dynamic series.

X - time points, natural numbers, placed from the middle (center) of the series to both ends.

In the presence of an odd number (in our study, an odd level, since the study was conducted over 11 years), the level occupying the middle position is taken as 0. For example, at 11 levels of the series: -5 -4, -3, -2, -1, 0, +1, +2, +3, +4, +5.

The calculations were carried out in the following sequence (see the appendix to the article):

1) Representing the actual levels of the dynamic series (Yactual).

2) Summing up the actual levels of the series and get the sum of the Yactual.

3) Conditional (theoretical) time points of the series X are found so that their sum (Σx2) is equal to 0.

4) The theoretical time points are squared and summed to get ΣX^2.

5) The product of x by y is calculated and summed up to get ΣXY.

6) The parameters of a straight line are calculated:

$$a0 = \frac{\Sigma\, y\ actual}{n} \quad a1 = \frac{\Sigma\, xy\ actual}{\Sigma\, x^2}$$

7) Substituting y = a0 + a1 x X values sequentially into the equation, the aligned levels of y are found.

For a generalized quantitative assessment of trends in the dynamic series, an indicator called the **average rate of increase (decrease)** "T incr.decr.", expressed in %, was used. When calculating it, the following formula can be used for most series:

$$Tincr. = \frac{a1 * K}{a0} \text{ x } 100\%$$

where K = 1 for an odd number of levels of the series; K = 2 for an even number of levels of the series.

a0 and a1 - linear dependence indicators used in the alignment of the series by the least squares method.

Discussion.

The scientific literature has a little information on the prevalence of EH, especially its histological types, since there are no routine screening procedures for detecting EC and its preceding pathological endometrial lesions [17].

Our study showed that during the analyzed period (2012-2022) there was a steady increase in the morbidity of EH, and two of its types, in the Republic of Kazakhstan. The average annual morbidity of EH was 4.59±0.81 cases per 100,000 female population (95% CI=2.77-6.40) with: NAEH - 4.32±0.78 cases per 100,000 female population (95% CI=2.61-6.04), AEH - 0.26±0.59 cases per 100,000 female population (95% CI=0.13-0.39). Moreover, the increase in the morbidity of EH was mainly due to NAEH. The results of our study are consistent with the data of global indicators, where cases of NAEH predominate over AEH, and account for 70% of all cases of EH [18]. The trend towards an increase in the incidence of EH among the female population of the Republic of Kazakhstan may be inextricably linked with the implementation of state programs ("Salamatty Kazakhstan 2011-2015", "Densaulyk 2016-2019"), where one of the tasks was to improve prevention measures and improve the detection of precancerous and malignant pathologies during screening examinations [19,20].

According to our study, the morbidity of EH had a heterogeneous distribution among the regions of Kazakhstan. The highest morbidity rates of EH were observed in the northern part of our country (North Kazakhstan region, Kostanay region, Pavlodar region), which may be related to the age structure of the population, where a high proportion of people over working age live, namely in the North Kazakhstan region - 17.7%, Kostanay region - 15.9%, Pavlodar region – 14.8%. [21]. The works of many authors indicate that the increase in the incidence of EH has a direct correlation with age [22,23]. The increase in morbidity rates in large cities of our country (Almaty, Nur-Sultan) can be explained by the availability of modern diagnostic and treatment methods for the population, as well as the lifestyle of a modern person in an intense rhythm of urban life, where high levels of stress and sedentary lifestyle lead to the development of metabolic diseases such as obesity, diabetes, cardiovascular diseases. It is known that these diseases are risk factors for the development of EH [22,24,25].

The results of our study showed that a high concentration of EH was observed in the group of women of the peri- and postmenopausal period, where age groups occupy the first three places: 45-49 years (15.09 cases), 50-54 years (11.13 cases), 65-69 years (10.73 cases). The increase in morbidity in this age group was due to cases of NAEH. Whereas cases of AEH were more often observed in women of reproductive age 45-49 years (0.95 cases) and 35-39 years (0.85 cases), as well as of perimenopausal age 50-54 years (0.47 cases). The increase in the morbidity of EH in women over the age of 45 can be explained by the current demographic situation in our country, due to the aging of the population and a larger number of women over the working age. According to the data of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, the change in the age structure of the population of Kazakhstan since 2009 has been expressed in a slight decrease in the proportion of the working-age population with increase in the proportion of the population over working age, associated with an increase in life expectancy [21]. On the one hand, the growth of EH morbidity in women of the perimenopausal period may be associated with the peculiarity of the course of this period, when ovarian function fades with the loss of female fertility, which leads to the development of menopausal disorders [1]. Therefore, in order to manage the symptoms of menopause, women use HRT as the main treatment. However, excessive and uncontrolled use of HRT can lead to the development of pathological overgrowth of the endometrium [26]. On the other hand, older women have many concomitant diseases, such as hypertension, diabetes mellitus, metabolic syndrome, thyroid diseases, which are risk factors leading to the development of EH [1]. Our results are comparable with the results of foreign colleagues who conducted a systematic review of the prevalence and morbidity of EH, according to which the morbidity of EH increased with age and peaked in South Korean women aged 46-50 years and women in the United States aged 45-49 years – 121 and 270 cases per 100,000 female years, respectively [27].

According to literature data, AEH is most frequently found on in women over 50 years of age, and is a clinically more dangerous type of EH, as it can rapidly progress to EC [28]. However, the results of our study showed that the age group of 35-39 years and 45-49 years turned out to be more susceptible to AEH. The shift in the incidence of AEH towards a younger age may be associated with a global increase in obesity and

metabolic disorders, the widespread prevalence of polycystic ovary syndrome, as well as women's reproductive behavior in relation to late marriage and conception of a child [29].

It should be noted that the analysis of the equalized indicators of the dynamic range of EH morbidity showed the highest average increase rate of EH in the age group of 35-39 years ($T_{aver.inc.}$=16.8%). There is a tendency of increase in the morbidity of EH among women of reproductive age, as well as their "competition" in this aspect with the age group of women of peri- and postmenopausal age. The probable reasons for the increase in the rate of growth of EH morbidity in this group of women is the tendency to postpone the first pregnancy to a later age in order to acquire a stable financial position, as well as the annual increase in infertility in our country. According to the literature, the most critical risk factor for the progression of EH in women of reproductive age is the absence of pregnancy for a long time [22]. Every year, 15% of infertile marriages are registered in Kazakhstan. WHO notes this level of infertility as a national problem, as it affects the demographic indicators of the country [30].

Strengths and weaknesses of the study.

The strengths of our study is that we analyzed the morbidity rates based on officially registered cases of EH and its histological types by age groups and regions of our country. We have not seen any previously published works devoted specifically to the study of the morbidity and prevalence of EH and its histological types among age groups, perhaps we are the first to conduct such work. The results of our study provide a scientific basis for understanding the epidemiological situation of the morbidity of EH and its histological types in our country in order to develop preventive programs.

The weaknesses of our study is that we did not analyze the medical histories of patients with EH, and therefore we were limited in understanding exactly which factors contributed to the development of this disease in each region and the age structure of our population. We intend to study the medical history and conduct a sociological survey among patients with EH in our further studies for thorough examination of the risk factors contributing to the progression of EH.

Conclusion.

Our analysis showed an increase in the morbidity rates of EH and its main histological types in the Republic of Kazakhstan over the period 2012-2022, with an increase in the morbidity due to an increase in cases of NAEH. It is noted that the highest morbidity rates are observed in the North Kazakhstan region (28.61 cases) and Almaty (12.01 cases per 100,000 female population). It was found that the peak morbidity of EH and its main histological types occurred in the age group of 45-49 years.

Thus, the revealed trends in the morbidity of EH and its histological types nation-wide and in each region, as well as the different distribution of EH among the age groups of the female population of the Republic of Kazakhstan reflect population changes in the estimated risk factors for the progression of EH. This circumstance requires an in-depth study of the risk factors contributing to the progression of EH in order to develop strategies and programs of therapeutic and preventive measures.

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Conflict of interest.

The authors claim that there is no conflict of interest.

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Абстракт

Актуальность: Гиперплазия эндометрия (ГЭ) – гинекологическое заболевание, характеризующееся патологическим разрастанием эндометрия в результате беспрепятственного действия эстрогенов. Актуальность данного заболевания заключается в заболеваемости женщин Республики Казахстан, что при отсутствии своевременной диагностики, лечения и динамического наблюдения может способствовать быстрому прогрессированию в рак эндометрия (РЭ).

Цель: Проанализировать показатели заболеваемости ГЭ и ее гистологических типов в Республики Казахстан за период 2012 – 2022 гг.

Материалы и методы: Проведен описательный, ретроспективный эпидемиологический анализ заболеваемости ГЭ и ее основных гистологических типов среди женского населения Республики Казахстан за период с 1 января 2012 г. по 31 декабря 2022 г. Материалом для исследования послужили данные из информационной системы «Электронный регистр стационарных больных» по впервые выявленным случаям с гистологическими подтвержденными диагнозами по Международной статистической классификации болезней и проблем, связанных со здоровьем, 10 пересмотра ВОЗ: N 85.0 – Железистая гиперплазия эндометрия (неатипичная гиперплазия эндометрия), N 85.1 – Аденоматозная гиперплазия эндометрия (атипичная гиперплазия эндометрия). Эпидемиологические показатели рассчитывались на 100 000 женского населения. Формирование базы данных и статистическая обработка результатов проводилась с помощью Microsoft Excel и статистического пакета программы SPSS Statistics 27.

Результаты: Проведенный анализ показал увеличение показателей заболеваемости ГЭ и ее основных гистологических типов в Республике Казахстан за период 2012-2022 гг. Отмечено, что при выравнивании показателей динамического ряда уровень увеличения заболеваемости ГЭ происходил в среднем на 13,7% ежегодно. За анализируемый период среднегодовой уровень заболеваемости ГЭ составил 4,59±0,81 случая на 100 000 женского населения (95% ДИ=2,77-6,40), неатипичной ГЭ - 4,32±0,78 (95% ДИ=2,61-6,04), атипичной ГЭ - 0,26±0,59 (95% ДИ=0,13-0,39) соответственно. Определены основные тенденции изменений показателей заболеваемости ГЭ в разрезе областей. Установлено, что пик заболеваемости ГЭ и ее основных гистологических типов приходился на возрастную группу 45-49 лет.

Заключение: Выявленные тенденции заболеваемости ГЭ и ее гистологических типов населения Республики Казахстан показали необходимость более детального изучения факторов риска, способствующих развитию ГЭ и

совершенствованию деятельности служб здравоохранения.

Ключевые слова: гиперплазия эндометрия, заболеваемость, атипичная гиперплазия эндометрия, профилактика, перименопауза.

ანოტაცია

Topicality: ენდომეტრიუმის ჰიპერპლაზია არის გინეკოლოგიური დაავადება, რომელსაც ახასიათებს ენდომეტრიუმის პათოლოგიური ჭარბი ზრდა ესტროგენების შეუფერხებელი მოქმედების შედეგად. ამ დაავადების აქტუალობა მდგომარეობს ყაზახეთის რესპუბლიკაში ქალების სიხშირეში, რამაც დროული დიაგნოზის, მკურნალობისა და დინამიური მონიტორინგის არარსებობის შემთხვევაში შეიძლება ხელი შეუწყოს ენდომეტრიუმის კიბოს სწრაფ პროგრესირებას (RE).

მიზანი: ანალიზი სიხშირე განაკვეთები და მისი ჰისტოლოგიური ტიპის ყაზახეთის რესპუბლიკაში პერიოდში 2012-2022. მასალები და მეთოდები: განხორციელდა GE-ს და მისი ძირითადი ჰისტოლოგიური ტიპების შემთხვევების აღწერითი, რეტროსპექტიული ეპიდემიოლოგიური ანალიზი ყაზახეთის რესპუბლიკის ქალ მოსახლეობაში 2012 წლის 1 იანვრიდან 2022 წლის 31 დეკემბრამდე პერიოდისთვის. კვლევის მასალა იყო სტაციონარულ პაციენტთა საინფორმაციო სისტემის ელექტრონული რეესტრის მონაცემები ახლად გამოვლენილი შემთხვევებისთვის ჰისტოლოგიურად დადასტურებული დიაგნოზებით დაავადებებისა და ჯანმრთელობასთან დაკავშირებული პრობლემების საერთაშორისო სტატისტიკური კლასიფიკაციის მიხედვით, WHO გადასინჯვა 10: N 85.0-ენდომეტრიუმის ჯირკვლის ჰიპერპლაზია (ატიპიური ენდომეტრიუმის ჰიპერპლაზია), N 85.1 – ენდომეტრიუმის ადენომატოზური ჰიპერპლაზია (ატიპიური ენდომეტრიუმის ჰიპერპლაზია). ეპიდემიოლოგიური მაჩვენებლები გამოითვლება 100,000 ქალი მოსახლეობაზე. მონაცემთა ბაზა ჩამოყალიბდა და შედეგები სტატისტიკურად დამუშავდა Microsoft Excel-ისა და SPSS Statistics 27 სტატისტიკური პროგრამული პაკეტის გამოყენებით.

შედეგები: ანალიზმა აჩვენა e-ს და მისი ძირითადი ჰისტოლოგიური ტიპების შემთხვევების ზრდა ყაზახეთის რესპუბლიკაში 2012-2022 წლების პერიოდში. აღინიშნა, რომ დინამიური დიაპაზონის ინდიკატორების გასწორებით, G-ს სიხშირე ყოველწლიურად საშუალოდ 13.7% - ით გაიზარდა. გაანალიზებული პერიოდის განმავლობაში, E-ს საშუალო წლიური სიხშირე იყო 4.59±0.81 შემთხვევა 100,000 ქალის პოპულაციაზე (95% CI=2.77-6.40), ატიპიური GE - 4.32±0.78 (95% CI=2.61-6.04), ატიპიური GE - 0.26±0.59 (95% CI=0.13-0.39), შესაბამისად. რეგიონების კონტექსტში GE-ს შემთხვევათა ცვლილებების ძირითადი ტენდენციები გამოიკვეთა. აღმოჩნდა, რომ E-ს პიკური სიხშირე და მისი ძირითადი ჰისტოლოგიური ტიპები მოხდა 45-49 წლის ასაკობრივ ჯგუფში.

დასკვნა: ყაზახეთის რესპუბლიკის მოსახლეობაში GE-ს და მისი ჰისტოლოგიური ტიპების შემთხვევების გამოვლენილმა ტენდენციებმა აჩვენა ge-ს განვითარების ხელშემწყობი რისკ-ფაქტორების უფრო დეტალური შესწავლის საჭიროება და ჯანდაცვის სერვისების გაუმჯობესება.

საკვანძო სიტყვები: ენდომეტრიუმის ჰიპერპლაზია, ავადობა, ატიპიური ენდომეტრიუმის ჰიპერპლაზია, პრევენცია, პერიმენოპაუზა.