GEORGIAN MEDICAL NEWS

ТБИЛИСИ - NEW YORK

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

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.

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 ინგ-ლისურენოვან 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 რეზიუმების (ინგლისურ,რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენ-ტული 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, შემა-ჯამებელი 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. მიკროფოტო-სურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი,ანათლების შედებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სუ-რათის 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 უცხო-ური 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 შემოხვევაში 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 ხელმძღვანე-ლის 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 შე-ჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემოხვევაში სტატიები არ განიხილება.

Содержание:

EARLY PROGNOSIS OF HYPOGALACTIA IN BREASTFEEDING MOTHERS: NEW OPPORTUNITIES FOR PRIMARY PREVENTION

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Abstract. An increase in the hypogalactia frequency diagnosis in breastfeeding mothers is one of the world-spread medical and social problems and is especially high in women with risk factors of lactation disorders. Early estimation of risk factors creates opportunities for physicians to diagnose the lactation problem that mothers face and solve it.

Aim. To identify and calculate prognostic criteria for determining the risk of hypogalactia in breastfeeding mothers and strategies to help women overcome them.

Materials and methods. Twenty-two factors that cause the most significant impact on the development of hypogalactia were selected, and their frequency was determined in 208 mothers with hypogalactia (group 1) and 388 mothers with normal lactation (group 2). The sequential Wald analysis, which compares the frequencies of distribution of traits in the study groups and determines their informativeness by calculating prognostic coefficients (PC) for different risk factors and estimating the individual risk of hypogalactia was used.

Results. The elder age of the breastfeeding mother (36 years and older) and its lower educational level promoted hypogalactia. Low security of the mother was associated with hypogalactia (PC -1,4). It was also found that mothers engaged in heavy physical labor suffer from hypogalactia more often than employees. Mothers' return to work, have been reported as factors that influence breastfeeding. Occupational hazards (noise, dyes, vibration, lead soldering, dust factors) and bad habits caused hypogalactia (PC -5,4). Prenatal breastfeeding education has been shown to prevent hypogalactia. A burdensome obstetric history (PC -3,9), habitual miscarriage (PC-1,4), and female genital diseases worsen the prognosis of lactation. Extragenital pathology was characterized by negative PC of hypogalactia, especially rheumatic fever, compensated heart defect (PC -3,2), chronic cardiovascular insufficiency (PC -11,4), congenital heart disease (PC -11,4), obesity (PC -4,8), diabetes mellitus (PC -5,8). The time of the first application to the breast affected the mothers' milk production.

Summary. The mathematical model of the individual prognosis of lactation in mothers contributes to the early detection of hypogalactia and the corresponding correction.

Key words. Prognosis, hypogalactia, mathematical model, prevention.

Раннее индивидуальное прогнозирование гипогалактии: новые возможности первичной профилактики

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Рост частоты гипогалактии у матерей является одной из актуальных медико-социальных проблем, особенно у женщин с факторами риска нарушения лактации. Ранняя оценка факторов риска дает возможность составить индивидуальный прогноз лактации, диагностировать и профилактировать ее нарушения.

Цель. Определить и расчитать прогностические критерии для раннего прогнозирования и выявления гипогалактии у кормящих матерей для дальнейшей профилактики.

Материалы и методы. В результате математического анализа отобрано 22 фактора, имевших наибольшее влияние на снижение лактации, и определена их частота у 208 матерей с гипогалактией (группа 1) и 388 матерей с полноценной лактацией (группа 2). Методом последовательного анализа Вальда, в основе которого лежит сравнение частот распределения признаков в исследуемых группах, определена их информативность с подсчетом прогностических коэффициентов (ПК) и оценки индивидуального суммарного риска гипогалактии.

Результаты. Старший возраст (более 36 лет) и низкий образовательный и материальный уровень матери способствуют развитию гипогалактии. Матери, занятые тяжелым физическим трудом, страдают гипогалактией чаще. Возвращение матери к профессиональной деятельности негативно влияет на лактацию. профессиональные и бытовые вредности (шум, краски, вибрация, свинцовая пайка, пылевые факторы) способствут гипогалактии (ПК -5,4). Пренатальное обучение вопросам грудного вскармливания матери и ее семьи, формируют мотивацию и предупреждают развитие гипогалактии. Отягощенный акушерский анамнез (ПК -3,9), невынашивание беременности в анамнезе (ПК -1,4), хронические генитальные заболевания ухудшают прогноз лактации. Екстрагенитальная патология матери характеризутся отрицательными прогностическими коэффициентами, в особенности порок сердца вследствие ревматической лихорадки (ПК -3,2), врожденные пороки сердца (ПК -11,4), хроническая сердечно-сосудистая недостаточность (ПК -11,4), ожирение (ПК - 4,8), сахарный диабет (ПК-5,8).

Выводы. Математическая модель индивидуального прогноза лактации у матерей способствует раннему выявлению гипогалактии и соответствующей ее коррекции.

Ключевые слова: прогноз, гипогалактия, математическая модель, профилактика.

Introduction. An important area of modern pediatrics is the study of hypogalactia, which is defined as inability to synthesize enough milk for infant growth requirements due to its rather high frequency of diagnosis and early cessation of breastfeeding [1].

Breastfeeding is the nourishment created by nature for newborns and infants. The benefits of human milk are well known. Breastfeeding is the optimal way of feeding neonates and infants and has vital importance for the child's development and health [2]. Breastfeeding is a protective factor for several infectious, atopic, and cardiovascular diseases. It also has a positive impact on immune development, microbiome, and health system factors [3], improves neurodevelopment and IQ and reduces the risk of attention deficit and behavioral disorders in children. Insufficient nutrition in the early periods of life places the infant at risk for disturbance of growth as well as serious and life-threatening complications of the diseases [4]. Lactation decreases the risk of sudden infant death syndrome by 36% and prevents 13% of infant mortality worldwide [5].

The World Health Organization (WHO), the Centers for Disease Control and Prevention, and the American Academy of Pediatrics recommend exclusive breastfeeding for 6 months after a child's birth [6]. The Baby-Friendly Hospital Initiative (BFHI) proposed by the United Nations Children's Fund (UNICEF) was introduced in 1993 to promote breastfeeding nationwide. The influence of compliance with UNICEF guidelines on breastfeeding duration is visible [7]. Research and clinical practice aimed to improve breastfeeding outcomes is focused on prehospital and hospital lactation support and education of mothers [1].

Many mothers give up breastfeeding earlier than recommended [2]. More than 68% of mothers were breastfeeding till the end of the third month, 31,5 - 34,4%, till the end of the sixth month, and only 2% continued to breastfeed for one year and longer [2,8].

So, the prevalence of breastfeeding nowadays is not optimal, and one of the main reasons is lactation insufficiency [1]. It has been estimated to affect 38-44% of newly postpartum women, and 29,3% of breastfeeding women at all, contributing to the nearly 60% of infants that are not breastfed according to the WHO guidelines [1]. It is known that 1 in 20 women worldwide are unable to successfully breastfeed and provide adequate nutrition for their infant through their breast milk exclusively [4].

The most spread reasons for never breastfeeding and for breastfeeding less than 6 months are insufficient milk and breastfeeding difficulties [8,9]. Hypogalactia is a complex phenomenon and a major reason in mothers worldwide for early termination of breastfeeding. Management of insufficient milk syndrome is an important part of encouraging breastfeeding success.

The increase of the hypogalactia frequency diagnosis in breastfed mothers is one of the widespread medical and social problems, its solving depends on the estimation of mothers' lactation possibility. However, researchers report that lactation insufficiency may be more often than is diagnosed [4].

According to modern research, the frequency of hypogalactia diagnosis is high in women with risk factors of lactation disorders [4].

Early estimation of risk factors creates opportunities for physicians to diagnose the problems that mothers face and solve [6]. According to the risk strategy, it is optimal to identify and estimate risk factors and determine their impact on the pathological process and the formation on the basis of risk groups for the development of hypogalactia.

Delayed or failed achievement of lactogenesis occurs as factors result of various maternal and/or infant interactions. Early recognition of these risk factors is critical for clinicians who interact with breastfeeding women so that intervention and achievement of full or partial breastfeeding can be preserved [10]. This article describes the maternal and infant conditions that contribute to unsuccessful lactation.

Health professionals need to have adequate knowledge about improving lactation methods, and the reasons for inducing lactation. However, the lack of information on the individual prognosis of lactation insufficiency makes it difficult [11].

Aim. To identify and calculate prognostic criteria (PC) for determining the risk of hypogalactia in breastfeeding mothers as well as strategies to help women overcome them.

Materials and methods. We predicted hypogalactia to determine the likelihood of lactation pathology. Biological, economical, medical and motivation factors which have influence on lactation were determined in 208 mothers and their children with hypogalactia (group 1) and 388 mothers with normal lactation and their children (group 2). Twenty-two factors that cause the most significant impact on the development of hypogalactia were selected. Hypogalactia in mothers was diagnosed according to clinical signs: insufficient weight gain of the child, control feeding at least three times, and control pumping of milk at intervals corresponding to the regime method of childs' feeding.

Mathematical criteria for determining the individual risk of hypogalactia were developed. The sequential Wald analysis, which is based on comparing the frequencies of distribution of traits in the study groups and determining their informativeness by calculating a prognostic value for different risk factors was used. The calculation of the frequency of symptoms in alternative conditions was performed according to formula 1.

PC= 10lg [P1 (xi / A1) / P2 (xj / A2)]

P1 - the probability of hypogalactia.

P2 - the probability of normal lactation.

X i,j - criteria of hypogalactia.

A1, A2 - group of states, respectively, hypogalactia and normal lactation.

Formula (2) was used to determine the threshold of diagnostic coefficients (TC)

$$TC\ A_1 = 10lg\ \frac{100-\alpha}{\beta} \qquad TC\ A_2 = 10lg\ \frac{\alpha}{100-\beta}$$

α and β are permissible errors of series 1 and 2, conditionally taken for 5%, the reliability of the results obtained should be 95% sensitivity. TC was ±13.

For calculation of the individual prognosis, PC values were added, and the amount obtained was estimated as follows: if a threshold of −13 was reached when adding PC, the development of hypogalactia can be expected with 95% sensitivity.

Ethical considerations. When the health examination of the patients was performed, the written informed consent forms from of every recipient for study purposes were obtained. This study was approved by the ethics review board of the Danylo Halytsky Lviv National Medical University with which the researchers were affiliated. The authors declare that there is no duality of interest associated with this manuscript.

Table 1. Prognostic coefficients of hypogalactia in breastfeeding mothers.

Prognostic criteria	Gradation of the criteria	Frequency of prognostic criteria				PC
		Hypogalactia, n=208		Normal lactation n=388		
		n, abs	%	n, abs	%	
Mother's age (years)	17-25	100	48,1	238	61,3	+0,1
	26-30	48	23,1	81	20,9	-0,5
	31-35	35	16,8	53	13,7	-0,8
	36-40	17	8,2	13	3,4	-3,8
	more than 40	8	3,8	3	0,7	-7,3
Elderly firstborn		26	12,5	23	5,9	-3,3
Season of childbirth	winter	63	30,4	62	15,9	-0,8
	spring	64	30,9	92	23,6	-1,1
	summer	38	18,3	112	28,9	+2,0
	autumn	42	20,2	122	31,6	+1,9
Mother's marital status	married	200	96,3	381	98,2	+0,1
	single	8	3,7	7	1,8	-3,1
Education	average	97	46,6	135	34,8	-1,1
	secondary special	52	25,0	127	32,7	+1,2
	high	46	22,2	102	26,3	+0,7
Social and professional group	workers	101	48,6	149	38,4	-1,0
	employees	88	42,3	167	43,0	+0,1
	agricultural workers	48	2,3	17	4,4	+2,8
	housewife	12	5,8	20	5,2	- 0,4
The nature of employment	mental	56	26,9	112	28,8	+0,3
	physical	92	44,2	150	38,7	-0,6
	business area	40	19,2	78	20,1	+0,2
	service sector	100	4,8	38	9,7	+3,0
	unemployed	100	4,8	10	2,5	-4,0
Material security	law	80	38,5	109	28,0	-1,4
	middle	119	57,2	275	70,8	+0,9
	high	9	4,3	7	1,7	-4,0
Occupational hazards		6	2,8	3	0,8	-5,4
Bad habits	smoking	5	2,4	4	1,0	-3,8
	alcohol abuse	2	1,0	-	-	-9,8
Serial number of pregnancies	1	112	53,9	227	58,5	+0,4
	2-3	69	33,2	131	33,8	+0,5
	4 and more	27	13,0	30	7,7	-2,3
Serial number of deliveries	1	115	55,7	245	63,1	+0,5
	2-3	84	40,4	139	35,9	+0,5
	4 and more	7	3,3	4	1,0	-4,8
Time of registration of the pregnant woman in the women's clinic and	before 12 weeks of gestation	132	63,5	270	69,6	+0,4
	after 12 weeks of gestation	67	32,2	112	28,9	-0,4
	we're not registered	89	4,3	6	1,5	-4,6
Targeting mothers and their families in breast-feeding promotion programs		185	88,9	368	94,9	+3,2
Complications of pregnancy	burdened obstetric history	39	18,8	29	7,5	-3,9
	gestosis of the first half of pregnancy	45	21,6	70	18,0	-0,8
	gestosis of the second half of pregnancy	43	20,7	29	7,5	-4,4
	edema of pregnant women	100	4,8	15	3,9	-0,9
	iron-deficiency anemia in pregnancy	41	19,7	13	3,4	-7,6
	risk of miscarriage	40	19,2	53	13,7	-1,4

Mother's disease	hypertension	11	5,2	2	1,8	-4,6
	rheumatic fever, compensated heart defect	8	3,8	2	1,8	-3,2
	chronic cardiovascular insufficiency	3	1,4	-	-	-11,4
	congenital heart disease	3	1,4	-	-	-11,4
	acute and chronic pyelonephritis	29	13,9	17	4,4	-4,9
	obesity 2-3 degree	15	7,2	4	0,96	-4,8
	diabetes mellitus	2	0,96	1	0,3	-5,8
	acute viral respiratory disease	23	11,1	35	9,0	-0,1
	Staphylococcal aureus carrier	1	0,5	7	1,8	-5,3
Complications of delivery and the postpartum period	urgent delivery	168	80,7	331	85,3	+0,3
	late delivery	27	12,9	43	11,1	-0,6
	premature birth	13	6,3	11	2,8	-3,5
	rapid delivery	9	4,3	10	2,6	-2,2
	weakness of labor	43	20,7	38	9,8	-3,2
	premature discharge of amniotic fluid	60	28,8	80	20,6	-1,4
	cesarean section	28	13,5	11	2,8	-6,8
	rupture of the section and vagina	20	9,6	16	4,1	-3,6
	use of obstetric forceps	11	5,2	6	1,5	-5,4
	revision of the urine cavity	42	20,2	70	18,0	-0,5
	bleeding in the natal and postnatal period	11	5,3	3	0,8	-8,2
Drugs that affect the contractile activity and tone of the myometrium (drugs based on horns (Claviceps Purpurea)		23	11,1	20	5,2	-3,3
Combination of risk factors complicating the course of pregnancy and delivery	0	20	9,6	156	40,2	+6,2
	1	66	31,7	122	31,4	-0,4
	2	85	40,9	77	19,8	-3,2
	3	29	13,9	30	7,8	-2,5
	4-5 and more	8	3,9	3	0,8	-6,9
Assessment of the newborn on the Apgar scale	8-10 points	12	57,6	286	73,7	+1,0
	6-7 points	82	39,5	101	26,0	-1,8
	5 points and less	6	2,9	1	0,3	-9,8
Diseases of the neonatal period	hypoxic and traumatic lesions of the central nervous system	72	34,8	74	19,1	-2,6
	asphyxia	12	5,8	9	2,3	-4,0
	respiratory disorders syndrome	5	2,4	3	0,8	-4,8
	prematurity	13	6,2	11	2,8	-3,4
	postmaturity	27	12,9	42	11,0	-0,6
Time of the first application to the breastfeeding	first 2 hours	142	68,2	364	94,0	+1,3
	second day and later	66	31,8	24	6,0	-1,5

Results. Twenty-two factors that cause the most significant impact on the development of hypogalactia were selected and their frequency was determined in 208 mothers with hypogalactia and 388 mothers with normal lactation (table 1).

Discussion. New evidence indicates that nutrition in the early life of the child seriously influences neurous and motor development, and affect later-life health outcomes, and disease risks. Noncorrect early life nutrition is associated with different pathology. Children who are adequately nourished are more likely to reach their developmental potential in cognitive, motor, and socioemotional abilities, with positive social interactions [12].

The percentage of interruption of breastfeeding in children at the 6th month is 45%. Such maternal factor, like insufficient milk is the most frequent reason that led to an early cessation [13].

In the article possible explanations for insufficient milk are analyzed, and new evidence of the influence of different biological, social, and medical factors on the development of hypogalactia in breastfeeding mothers and the algorithm for the calculation of individual prognosis for the hypogalactia development in every other mother is provided.

Although there is no clear way to predict who will experience impaired lactation, knowledge about the risk factors can enable

health care professionals to better identify risk mother-infant dyads. Early intervention may help prevent infant complications associated with inadequate nutritional intake [4].

In the study, the elder age of breastfeeding mothers was a serious risk factor for lactation insufficiency. While at the mother's aged 18-25 years PC was (+0,1), it decreased up to (-3,8) at the age 36-40 years. Age had a serious bearing on the occurrence of lactation failure [14].

The higher educational level of the mother promoted full lactation. Thus, in mothers with secondary special education PC was (+1,0), and in mothers with secondary general education PC (−1,1). That is similar to Moss KM, et al. [8] that mothers of children who received human milk for less than 6 months were more likely to have a lower education compared to mothers of children exclusively breastfed. Low education had a serious influence on the occurrence of lactation failure.

The best for lactation was the middle security of the mother (PC +0,9), the same data were received by Mathur N.B., et al. [14] that socio-economic status, influenced the occurrence of lactation failure. There is a possibility that lactating mothers practicing exclusive breastfeeding and living under harsh conditions may experience periods of low breast milk volume, indicate dietary inadequacies, and require nutritional intervention [15].

It was also found that mothers engaged in heavy physical labor suffer from hypogalactia more often than employees. Mothers' return to work, have been reported as factors that influence breastfeeding [6] and the most frequent reasons (43,4%) for giving up breastfeeding [2].

Occupational hazards (noise, dyes, vibration, lead soldering, dust factors) and bad habits along with the negative impact on the pregnancy caused hypogalactia (PC -5,4). That was similar to Moss KM, et al. [8] that mothers of children who received human milk for less than 6 months were more likely to smoke. Exposure of lactating women to environmental cigarette smoke may increase nicotine in breast milk, which in turn may reduce the volume of milk and the duration of breastfeeding [16].

Increasing the serial number of pregnancies from the first to fourth and more decreased PC from +0,4 to -2,3; while increasing the serial number of deliveries from the first to fourth and more decreased PC from +0,5 to -4,8.

Early time registration of the pregnant mother in women's clinics and targeting mothers and fathers in breastfeeding promotion programs in medical institutions had a positive influence on lactation (PC +0,4). Prenatal breastfeeding education has been reported as a factor that influences breastfeeding [6].

Targeting mothers and their family in breastfeeding promotion programs are recommended. The research found that the father's support positively impacts breastfeeding duration and exclusivity in the form of father's/partner's parental-child interactions [17]. Prenatal breastfeeding education has been shown to prevent hypogalactia [6,18]. Family-centered models for breastfeeding, peer support groups, and technology have been studied as potential ways to help women meet their breastfeeding goals [6]. Professional and non-professional support plays a great role in motivation to start and continue breastfeeding [13]. A system of professional lactation support for breastfeeding mothers must

work, and include visitations to the outpatient breastfeeding service, and contact with breastfeeding mothers' support groups [2]. Though, it is determined that impaired lactation can occur despite maternal motivation, knowledge, support, and appropriate breastfeeding technique [4].

A burdensome obstetric history (PC -3,9), habitual miscarriage (PC -1,4), and female genital diseases worsen the prognosis of lactation. It was reported a new autoimmune etiology for isolated prolactin deficiency and puerperal hypogalactia in mothers [19]. Early hypogalactia was shown to be a neuroendocrine pathology affecting the central links of regulation of lactation as well as the function of the peripheral endocrine glands [20].

All extragenital pathology was characterized by negative PC of hypogalactia. Particularly high levels of lactation disorders were characteristic of cardiovascular pathology (hypertension, rheumatic and congenital heart disease, chronic circulatory failure) in the range of PC (-3,2) and (-11,4), which is similar to Yu X, et al. [21] that pregnancy-induced hypertension syndrome was found to be the risk factors for delayed lactogenesis. Emotional stress, anxiety, pain and maternal illness are the various psychosomatic factors that influence the production of milk and can reduce milk supply [22]. Obesity in breastfeeding mothers, especially 2-3 degrees caused a high risk of hypogalactia. That is similar to Moss KM, et al. [8] that mothers of children who received human milk for less than 6 months were more likely to be overweight/obese. Lactation insufficiency in obese breastfeeding mothers has an endocrine explanation as to the result of the failure of prolactin secretion, and inhibition of secretion by progesterone and estrogens through sequestration of progesterone and aromatization of estrogen in mammary adipose tissue [23].

Factors of high risk of hypogalactia in the mother were gestosis (preeclampsia) of 1-3 degrees (PC -4,4) and iron deficiency anemia (PC -7,6), so treatment for women with postpartum iron-deficient anemia increases the likelihood of lactation.

The use of drugs based on horns (Claviceps Purpurea) negatively influences lactation (PC -3,3). Also, the adverse effects of metoclopramide, bromocriptine, and domperidone must be weighed against the benefits of breastfeeding [24].

Hypogalactia developed during surgery: cesarean section, vacuum extraction, the use of obstetric forceps, as well as bleeding in the natal and early neonatal period (PC -5,4; -6,8; -8,2; respectively). The method of delivery has been reported as a factor that seriously influences breastfeeding [6]. The volume of milk transferred to infants born by cesarean section was significantly less than that transferred to infants born by normal vaginal delivery.

Unsatisfactory lactation of the previous child may determine the nature of lactation in subsequent pregnancies and births (PC -7,1).

Shorter postpartum excessive breast engorgement [25] was found to be the risk factor for delayed lactogenesis, but it was not analyzed in our study.

Newborn diseases were characterized by a high risk of developing hypogalactia: hypoxic-traumatic lesions of the central nervous system (PC -2,6), internal asphyxia (PC -4,0), partly as the result of the negative effect of the weakness of the

sucking reflex (PC-5,3). Prematurity (PC -3,4) was a serious risk factor for hypogalactia. It is evident, that perceived breast milk insufficiency was present in mothers of preterm babies [14].

Assessment of the newborn on the Apgar scale 5 points and less is the risk factor for hypogalactia (PC- 9,8). Lactation is negatively affected by the application of the child to the breast after the second day and even more after the fourth. Delayed expression initiation was found to be the risk factor for delayed lactogenesis [21].

Physicians must continue to improve their knowledge regarding lactation and risk factors of hypogalactia. Father education will allow for alterations in standard practices and improve breastfeeding. More research into this problem is necessary for early diagnosing and treating lactation insufficiency [21]. Influences on unsuccessful breastfeeding should direct changes in prenatal, intrapartum, and postpartum practices [26-30].

Conclusion. Risk factors for impaired lactogenesis are identifiable and possible to diagnose using prognostic coefficients of a mathematical model of individual prognosis of hypogalactia. Clinicians must be able to predict and recognize hypogalactia during pregnancy. Women who are at risk for delayed lactogenesis need targeted interventions and additional support during pregnancy and postpartum. Universal and individual strategies are required to increase rates of exclusive breastfeeding.

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