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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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RISK MANAGEMENT AND HEALTH SUPPORT FOR PREGNANT WOMEN USING INOSITOLS

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Abstract.

Objective: To evaluate the association between myo-inositol supplementation and the risk of fetal macrosomia in pregnant women with a history of large-for-gestational-age infants, and to assess its relationship with gestational weight gain in women with overweight or obesity.

Methods: A prospective observational study was conducted in antenatal clinics and the Almaty Center for Perinatology and Pediatric Cardiac Surgery. Myo-inositol supplementation was recommended as part of routine clinical practice and taken daily for up to 6 months. Participants attended four visits: baseline (<12 weeks), 20 weeks, 30 weeks, and delivery. The main group included women with a BMI of 25–35 kg/m² and a history of delivering infants weighing >4000 g. The comparison group was formed using a clinical risk scoring system to improve group comparability.

Results: Gestational weight gain was significantly lower in the myo-inositol group (11.82 kg) compared with the comparison group (17.85 kg; $p<0.001$). The incidence of macrosomia was lower in women who used myo-inositol supplementation (5.9% vs. 55.9%). Mean neonatal birth weight was also lower in the supplementation group (3658.9 g vs. 3972.5 g), with a mean difference of 313.6 g (95% CI 173.5–453.8). Emergency cesarean delivery occurred less frequently in the supplementation group (3.9% vs. 15.7%), indicating improved obstetric outcomes.

Conclusion: In this high-risk cohort, the use of myo-inositol supplementation was associated with lower gestational weight gain and a lower incidence of fetal macrosomia. These findings suggest a potential beneficial role of myo-inositol in the prevention of excessive fetal growth; however, randomized controlled trials are needed to confirm causality.

Key words. Myo-inositol, macrosomia, large-for-gestational-age, pregnancy.

Introduction.

Macrosomia is defined as a birth weight exceeding the expected range for gestational age [1]. Despite the availability of international guidelines on gestational weight gain, the prevalence of macrosomia continues to rise due to increasing rates of pre-pregnancy overweight, obesity, and excessive gestational weight gain. Excessive weight gain beginning as early as the first trimester leads to higher maternal adiposity, disrupted carbohydrate–lipid metabolism, and significantly increases the risks of hypertensive disorders, pregnancy-induced edema, and placental dysfunction [2-4]. These changes contribute to abnormal labor physiology and negatively affect both maternal and neonatal outcomes.

Inositols, particularly myo-inositol, have gained attention as potential metabolic modulators during pregnancy [5-6]. Myo-inositol, the predominant naturally occurring isomer, plays an essential role in insulin signaling, glucose and lipid metabolism, endocrine regulation, and cellular stress responses. Its insulin-like properties and ability to improve glycemic regulation have been associated with improved metabolic profiles in women with obesity or metabolic disturbances [7]. Despite evidence supporting the benefits of myo-inositol in reducing the risk of gestational diabetes and hyperinsulinemia, its role in preventing macrosomia in high-risk women remains insufficiently studied [8].

Maternal overweight and obesity are well-established predictors of adverse pregnancy outcomes. These conditions promote inflammation, oxidative stress, hormonal imbalance, and epigenetic changes that may influence fetal development. Excess maternal weight increases the risks of macrosomia, neonatal respiratory complications, and perinatal mortality. Obese pregnant women face higher risks of preeclampsia, venous thromboembolism, gestational diabetes, hypertension, and postpartum hemorrhage [9]. Excessive gestational weight gain further contributes to these complications and predicts continued weight gain and higher BMI in subsequent pregnancies [10-11].

Lifestyle modifications before conception, including weight reduction, are widely recommended in international guidelines to reduce the risk of adverse pregnancy outcomes. Even modest weight loss between pregnancies has been associated with significant reductions in gestational complications. A meta-analysis by Dodd et al. demonstrated that combined dietary management and physical activity enabled postpartum women to achieve clinically meaningful weight reduction [12].

Recent studies have also explored the potential association between myo-inositol combined with folic acid and a reduced recurrence of macrosomia. In the PONTI study, involving women with a history of macrosomia, no cases of recurrent macrosomia occurred in participants receiving myo-inositol + folic acid, whereas three cases were recorded in the folic acid–only group [13]. These findings indicate the potential benefit of myo-inositol supplementation for women at high risk of macrosomia and highlight the importance of further investigation.

Materials and Methods.

This prospective observational study was conducted in antenatal clinics and at the Center for Perinatology and Pediatric Cardiac Surgery in Almaty. Myo-inositol supplementation was recommended as part of routine clinical practice and was taken daily for up to 6 months; the decision to initiate and continue supplementation was made by the participants themselves based on individual preference. No randomization or investigator-

directed assignment was performed. The formulation used contained myo-inositol (1500 mg per sachet), folic acid (200 μg), vitamin B12 (2.5 μg), and calcium lactate (62 mg).

The study protocol included four scheduled visits:

(1) baseline visit before 12 weeks of gestation (first-trimester ultrasound screening, assessment of BMI and maternal weight);

(2) visit at 20 weeks of gestation (second ultrasound screening and maternal weight assessment);

(3) visit at 30 weeks of gestation (third ultrasound screening and maternal weight assessment);

(4) delivery (assessment of neonatal birth weight and delivery outcomes).

No procedures beyond routine clinical care were performed; data were collected using a standardized case report form.

The primary outcomes included gestational weight gain and the incidence of fetal macrosomia (birth weight >4000 g). Secondary outcomes included ultrasound-estimated fetal weight at different gestational ages and delivery outcomes (rate of emergency cesarean section, presence of clinically contracted pelvis, and neonatal condition assessed by Apgar score at birth).

As group allocation was not randomized, the comparison group was selected based on the clinical characteristics of participants in the supplementation group. For each participant in the main group, two participants from the comparison group with the most similar clinical profiles were selected using a point-based clinical risk scoring system (Table 1).

Inclusion criteria:

- pregnant women aged 18 to 45 years;
- a history of delivering infants with a large birth weight of 4000 g;
- pregnant women registered at antenatal clinics in Almaty;
- gestational age at the time of enrollment between 10 and 12 weeks (corresponding to the first ultrasound screening);
- body mass index (BMI) between 25–35 kg/m² at the first visit;
- willingness to use myo-inositol supplementation as recommended in routine care;
- ability to attend all scheduled visits (4 visits: before 12 weeks, at 20 weeks, at 30 weeks, and at delivery).

Exclusion criteria:

- pregnant women with confirmed severe chronic diseases (cardiovascular diseases, pregestational diabetes mellitus (type 1 or type 2), renal or hepatic insufficiency, autoimmune diseases, etc.);
- known intolerance to any component of the supplement;
- presence of severe pregnancy pathologies (preeclampsia, placental insufficiency, severe anemia, etc.) at the time of enrollment;
- simultaneous participation in other clinical studies;
- women with contraindications to participation in the study or those unable to attend scheduled visits;
- inability to adhere to the prescribed regimen of supplementation and visit schedule.

To reduce selection bias and improve comparability between groups, a clinical risk scoring system was applied. Participants in the supplementation group were matched with two participants from the comparison group with identical or maximally similar total risk scores (Table 1).

Table 1. *Clinical characteristics used to reduce systematic bias.*

Factor	Condition	Points
Maternal age (years)	<30	0
	30-35	1
	36-40	2
	> 40	3
Body mass index (BMI)	<25	0
	25–29.9	2
	≥ 30	3
History of large-for-gestational-age infant	No	0
	Yes	3
Gestational diabetes mellitus during current pregnancy	No	0
	Yes	3
Uterine scar	No	0
	Yes	2
Other factors (clinically contracted pelvis, large fetus, etc.)	No	0
	Yes	2
Preterm birth	No	0
	Yes	2
Prelabor Rupture of Membranes (Labor induction)	No	0
	Yes	1

Statistical method for sample size calculation:

The sample size was calculated using the formula for determining the sample size for comparing mean values:

$$n = \frac{\Delta^2 (Z_{1-\alpha/2} + Z_1 - \beta)^2}{\sigma^2}$$

- σ — standard deviation (534 g)
- Δ — the minimally significant difference between the groups (200 g)
- Z1−α/2 — the critical value of the normal distribution for a 5% significance level (1.96)
- Z1−β — the critical value of the normal distribution for 80% power (0.84).

The sample size of the study was 102 participants in the comparison group and 51 participants in the main group, which corresponds to the calculations using the parameters listed above, where the required group size ranged from 44 to 115 participants. In cases of missing or incomplete quantitative data, median imputation of the corresponding parameter was applied to ensure the integrity of the analysis.

Maternal age, body mass index, history of large-for-gestational-age infant, gestational diabetes mellitus, uterine scar, preterm birth, prelabor rupture of membranes, and other obstetric risk factors were recorded for all participants and incorporated into the clinical risk scoring system used for group matching (Table 1).

The total cumulative risk score across the study population was 547 points, with a mean score of 3.58 points per participant. The risk score was used to improve comparability between

groups and to describe baseline risk profiles; it was not intended to serve as a validated predictive model.

Statistical analysis was supported by AI-based analytical tools provided by Cerebra.AI.

Results.

A total of 153 women participated in the study, divided into two groups: the Main group (n=51), who used myo-inositol supplementation as recommended in routine clinical practice, and the Comparison group (n=102), who did not use myo-inositol supplementation. The study was conducted at antenatal clinics and the Center for Perinatology and Pediatric Cardiac Surgery in Almaty using prospective observation.

We performed a statistical analysis of the age and anthropometric characteristics of women in the two groups. In the main group, the mean age was 34.6 ± 5.4 years, while in the comparison group the mean age was slightly lower at 30.2 ± 5.2 years. The mean BMI in the comparison group was 29.8 ± 4.3, and in the main group — 30.9 ± 4.5. The average weight of pregnant women at the time of registration for pregnancy follow-up was 84.2 kg in the main group and 82.5 kg in the comparison group. Thus, the analysis showed that the differences between the groups for these characteristics were not statistically significant, indicating acceptable baseline comparability between the groups (Figure 1).

The analysis showed that at the time of pregnancy registration (12 weeks), the mean body weight in the main and comparison groups was 71.31 kg, with no statistically significant differences (t-statistic = –0.09, p-value = 0.9294). Before delivery, the mean body weight was 83.14 kg in the main group and 96.04 kg in the comparison group, demonstrating significant differences (t-statistic = –2.44, p-value = 0.0160).

Summary statistics of weight changes indicated that the average gestational weight gain was considerably higher in the comparison group (17.85 kg) compared with the main group (11.82 kg), which was statistically confirmed (t-statistic = –8.33, p-value = 0.0000) (Figure 2).

Thus, the analysis of weight dynamics during pregnancy showed that the use of myo-inositol supplementation for 6 months contributed to improved metabolic parameters, which are associated with a reduced risk of serious pregnancy complications such as preeclampsia, gestational hypertension, cesarean section, preterm birth, and insufficient or excessive fetal growth by the time of delivery.

Similar results were obtained in the studies by Minozzi M. and Nordio M. (2013) [14], showing that the intake of myo-inositol at a dose of 4,000 mg/day can lead to weight reduction, improvement of the lipid profile, and normalization of blood glucose levels in patients with obesity and insulin resistance. Assessment of the lipid profile in 20 women with obesity (BMI – 34 ± 6 kg/m²) before and after six months of therapy demonstrated an increase in high-density lipoproteins by 0.1 mmol/L ($p < 0.05$), a decrease in low-density lipoproteins from 3.50 ± 0.8 to 3.0 ± 1.2 mmol/L ($p < 0.05$), and a reduction in triglycerides from 2.3 ± 1.5 to 1.75 ± 1.8 mmol/L ($p < 0.05$). Twenty patients with obesity were enrolled [BMI 33.7 ± 6 kg/m² (mean ± SD)]. The lipid profile was assessed by measuring total cholesterol, LDL, HDL, and triglycerides before and after 6 months of combination therapy. Combination therapy with myo-inositol was shown to improve the metabolic profile of women, thereby reducing their cardiovascular risk [15].

Chabanova N. B. et al. published the results of a prospective study involving 100 pregnant women [16]. The examination included measurement of height, body weight, and the determination of body mass index followed by the calculation of weight gain in the first, second, and third trimesters of pregnancy. Excessive gestational weight gain was more common in women who were overweight or obese compared with those who initially had normal or insufficient body weight. The authors concluded that the magnitude of gestational weight gain depends on the initial BMI. As BMI increases, the frequency of excessive gestational weight gain also rises.

Based on the data obtained and the available literature, it can be concluded that the use of a combined myo-inositol supplementation may represent a potentially beneficial supportive approach for gestational weight management in pregnant women with obesity. Improved weight stabilization, which in turn reduces the likelihood of fetal macrosomia [17-18].

As part of the study evaluating the frequency of macrosomia (fetal weight > 4000 g) among women using myo-inositol supplementation, an assessment of birth weight was performed, taking into account the minimally clinically significant difference of 200 g (standard deviation — 534 g, significance level (α) — 5%, statistical power (1–β) — 80%). Based on the analysis, the mean fetal weight in the group of pregnant women using the supplement was 3658.92 g, which was lower than in the comparison group that did not use myo-inositol — 3972.54 g. The mean difference in fetal weight between the groups was 313.62 g, with a 95% CI of 173.45 g to 453.79 g. These findings demonstrate a statistically significant difference in fetal weight between the groups. The proportion of large-for-gestational-age infants was 5.9% (95% CI 2.0–16.0%) in the group using myo-inositol supplementation and 55.9% (95% CI 46.2–65.2%) in the comparison group (χ^2 test, $p < 0.001$) (Figure 3 and 4).

Similar results were obtained in the studies by D'Anna (2015) [19] and Matarrelli (2013) [20], which demonstrated that the use of myo-inositol in pregnant women from high-risk groups can reduce fetal weight by improving glucose regulation and insulin response. Based on our own findings and existing literature, it can be stated that myo-inositol supplementation is an effective means of improving metabolic processes in pregnant women at risk. Its use helps normalize fetal weight, which in turn reduces the risk of macrosomia and supports the use of myo-inositol as the preventive option of choice for large-for-gestational-age infants in similar high-risk groups.

At 20 weeks of gestation (ultrasound screening), the estimated fetal weight based on fetometry in the main group was 361.51 g, with a median of 362 g, a minimum of 310 g, and a maximum of 398 g. In the comparison group, the mean fetal weight was similar at 361.60 g, with the same median value of 362 g and an identical weight range of 310 g to 398 g. Thus, during the second screening, fetal weight indicators between the main and comparison groups were nearly identical. At 30 weeks of gestation (third screening), the mean fetal weight in the main

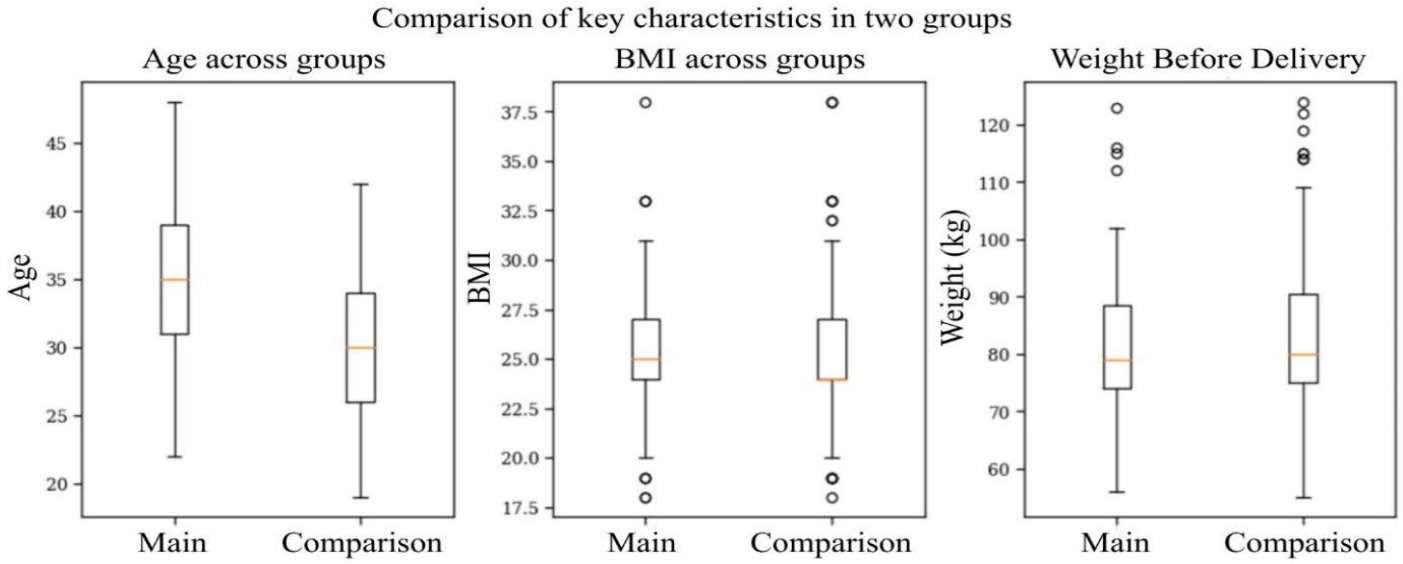

Figure 1. *Age, body mass index, and weight of pregnant women at the time of registration in the study groups.*

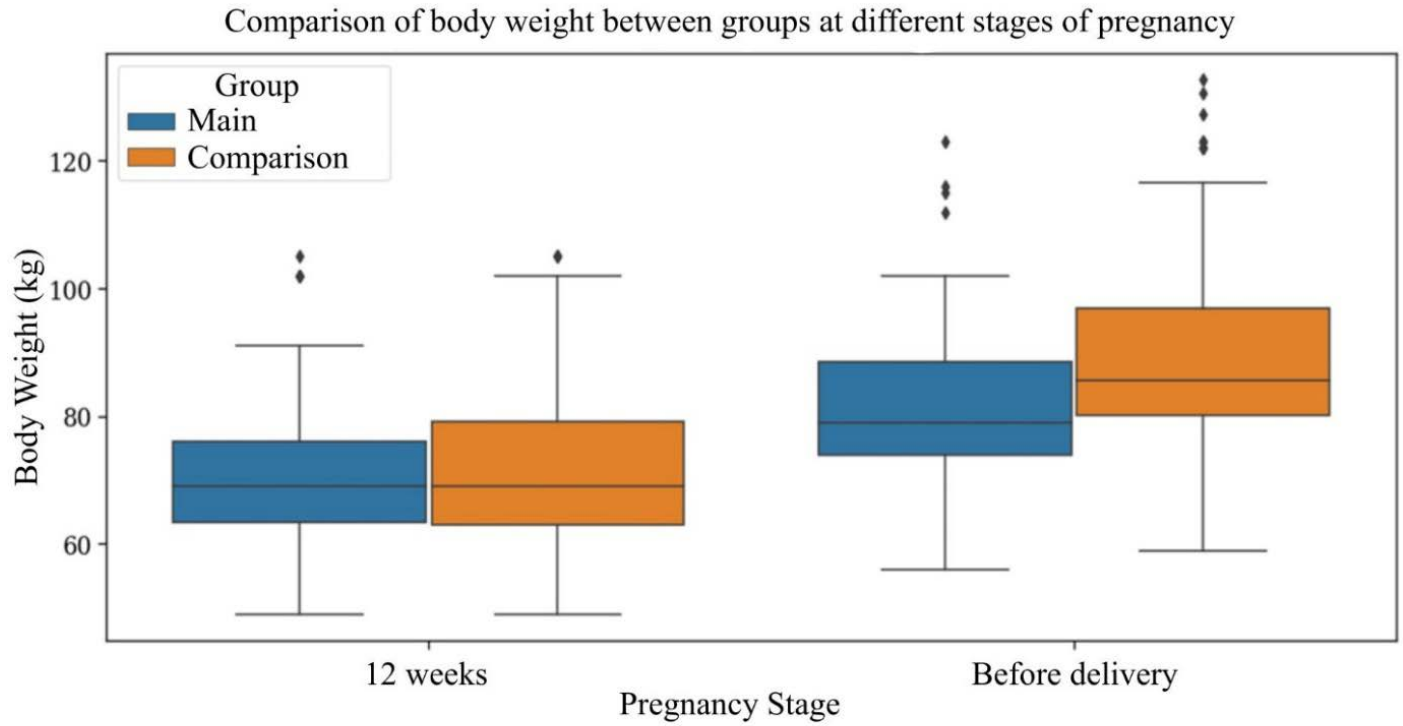

Figure 2. *Analysis of body weight dynamics in women during pregnancy.*

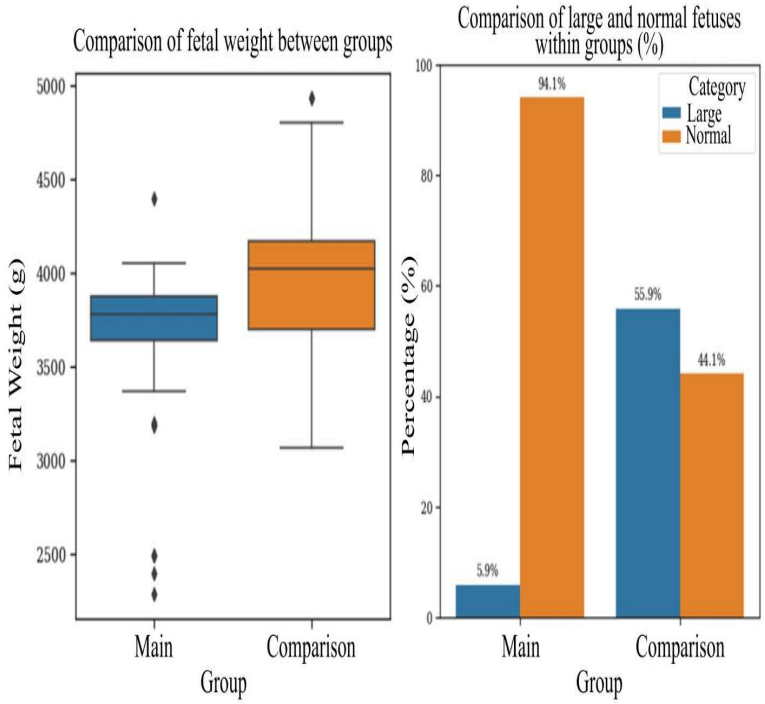

Figure 3. *Frequency of macrosomia in the studied groups.*

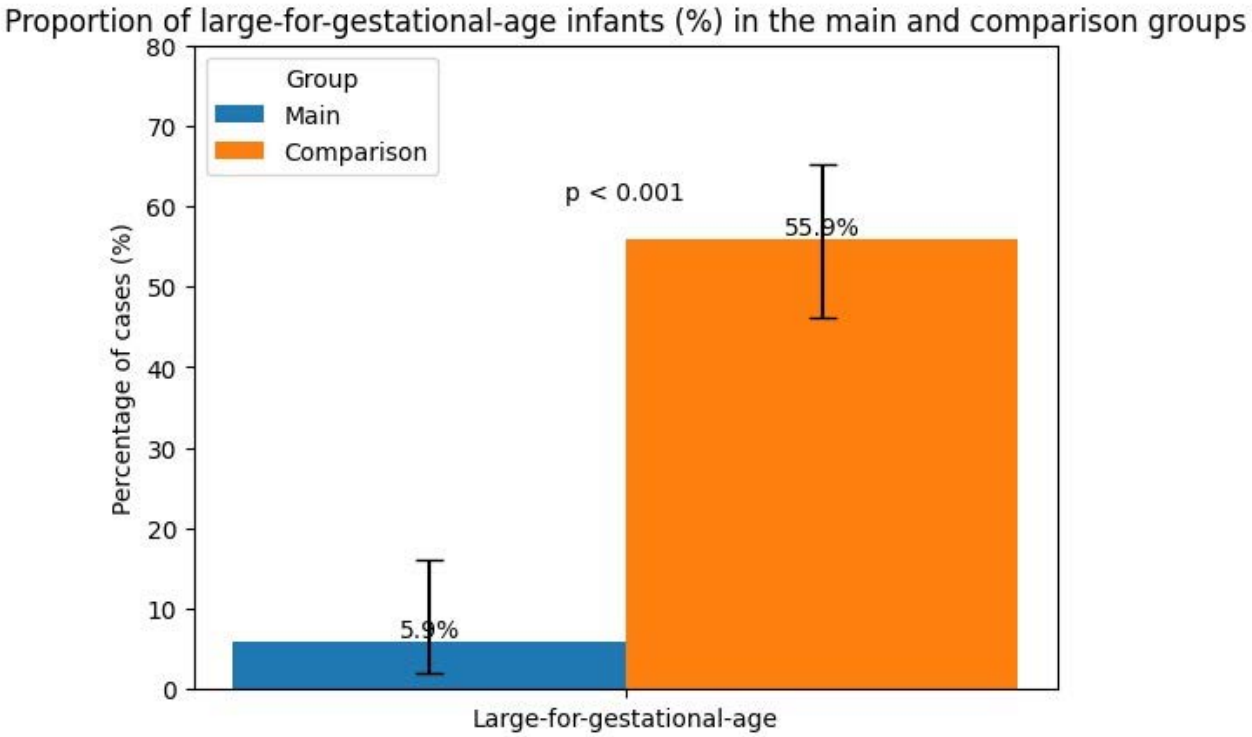

Figure 4. *Proportion of large-for-gestational-age infants (%) in the main and comparison groups.*

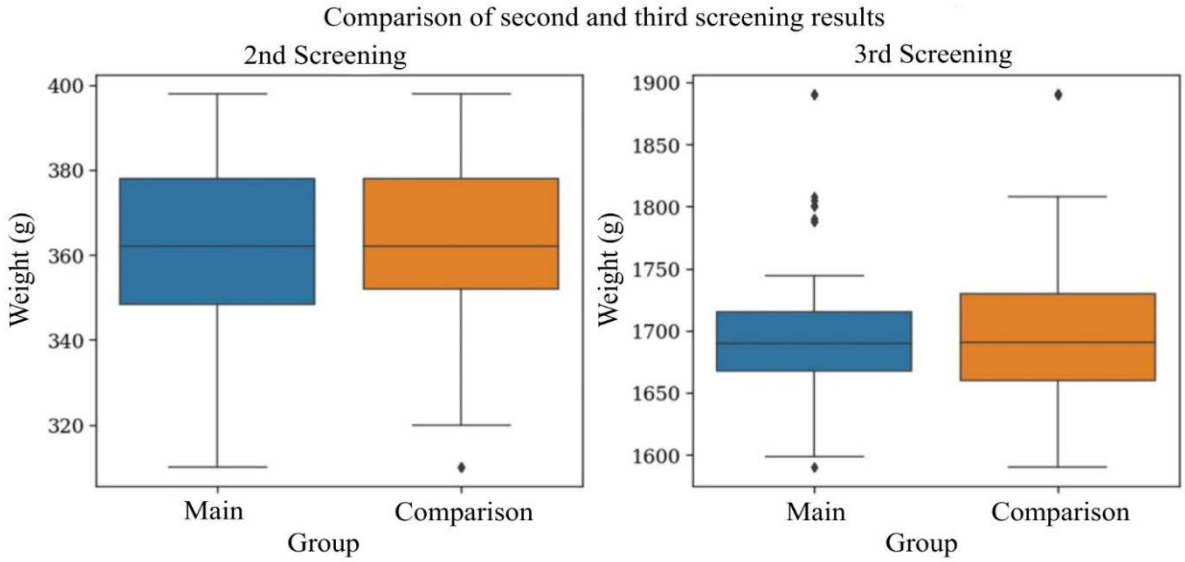

Figure 5. *Comparative analysis of fetal weight according to fetometry at 20 and 30 weeks of pregnancy.*

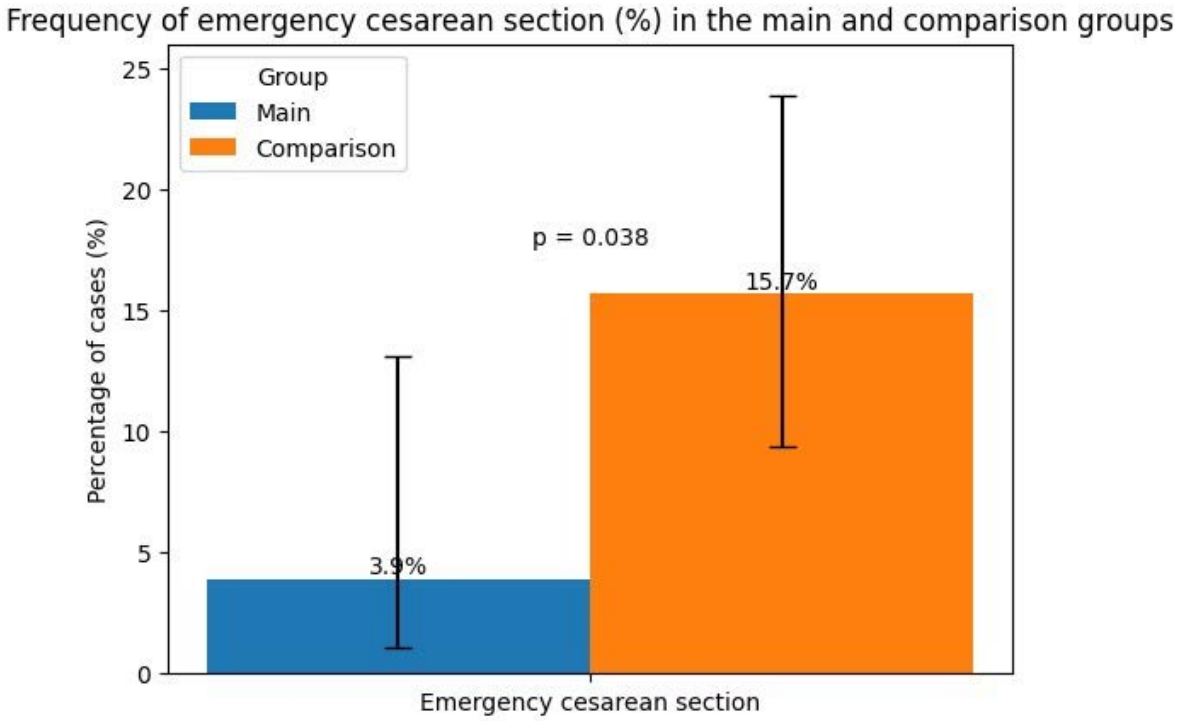

Figure 6. *Frequency of emergency cesarean sections in the studied groups.*

group was 1701.24 g, with a median of 1690 g, a minimum of 1590 g, and a maximum of 1891 g. In the comparison group, the mean fetal weight was 1702.87 g, the median was 1691 g, with a minimum of 1590 g and a maximum of 1891 g. Thus, according to fetometry results at 20 and 30 weeks, no signs of large-for-gestational-age fetus formation were identified, and it was not possible to predict the development of macrosomia at these stages (Figure 5).

Based on the analysis of delivery outcomes, in particular the frequency of emergency caesarean sections performed due to clinical disproportion between the mother's pelvic dimensions and the fetal head size, the rate of emergency caesarean delivery in the main group was only 3.9%, whereas in the comparison group it was 15.7%, representing an approximately fourfold difference (χ^2 test, $p = 0.038$). These findings indicate that the use of myo-inositol supplementation was associated with a significantly lower rate of emergency caesarean sections (Figure 6).

Discussion.

The present study yielded clinically relevant data on the association between myo-inositol supplementation and

maternal body mass index, newborn weight, the frequency of clinical disproportion between maternal and fetal sizes during the second stage of labor, and the rate of emergency caesarean sections.

1. The results of the study demonstrated statistically significant differences in fetal weight between the groups who used and did not use myo-inositol supplementation. The use of the myo-inositol supplementation was associated with a lower incidence of large-for-gestational-age infants in this high-risk cohort. These findings may be considered when discussing potential supportive strategies for women at increased risk of macrosomia; however, causality cannot be established due to the observational study design.

2. The results obtained from ultrasound monitoring of fetal weight at 20 and 30 weeks did not reveal any signs of large-for-gestational-age fetus formation, making it impossible to predict macrosomia based on fetometry data at these stages of pregnancy. Therefore, it is necessary to consider performing ultrasound examination at term in this group of pregnant women to assess the estimated fetal weight.

3. The use of myo-inositol supplementation was associated with lower gestational weight gain among women with overweight or obesity. Lower gestational weight gain may be associated with improved maternal metabolic profiles and potentially more favourable pregnancy outcomes; however, further controlled studies are required to clarify the direction and magnitude of this association.

4. The frequency of emergency caesarean sections was lower in the supplementation group compared with the comparison group (3.9% vs. 15.7%). This observation suggests a possible association between myo-inositol supplementation and a lower rate of emergency operative delivery; however, given the non-randomized observational design, these findings should be interpreted with caution.

In addition, the potential confounding effect of gestational diabetes mellitus during the current pregnancy cannot be excluded and represents an additional limitation of this observational study.

Conclusion.

Overall, the findings of this prospective observational study suggest a potential beneficial association between myo-inositol supplementation and selected maternal and neonatal outcomes in women at high risk of fetal macrosomia and excessive gestational weight gain. Nevertheless, randomized controlled trials and studies with more comprehensive adjustment for metabolic, behavioral, and socioeconomic confounders are required to confirm these observations and establish causality.

Conflict of Interest.

The authors declare no financial or commercial relationships with manufacturers of myo-inositol supplements. Cerebra.AI provided analytical support only and had no role in study design, data collection, data interpretation, or publication decisions.

Ethical Approval.

The study protocol was reviewed and approved by the Local Bioethics Commission of S.D. Asfendiyarov Kazakh National Medical University (Almaty, Kazakhstan) (Meeting No. 24 (160), January 28, 2025). Written informed consent was obtained from all participants prior to inclusion.

Patient Consent.

Written informed consent was obtained from all participants prior to inclusion in the study.

Funding Information.

None.

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