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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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IMPACT OF THE FIRST TRIMESTER PREECLAMPSIA SCREENING TEST ON THE OUTCOME OF PREGNANCY BETWEEN THE PATIENTS WITH OR WITHOUT THE DIAGNOSIS OF INFERTILITY

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Abstract.

Background: Hypertensive disorders are one of the leading causes of maternal and perinatal morbidity and mortality worldwide. It is responsible for around 16% of maternal deaths globally, in 2023 this was the equivalent to around 42 000 deaths. Pre-eclampsia is a hypertensive disorder that affects 3-8% of women who give birth worldwide.

Aim: To assess the effectiveness of the first-trimester preeclampsia screening test on Caucasian population and define the impact of conception method on the risk of preeclampsia.

Methods: A prospective observational study was conducted at the Zurab Sabakhtarashvili Reproductive Clinic (ZSRC) on the pregnant women from 2021 (January)-2025 (November). All of the participants of the study underwent preeclampsia (PE) first-semester screening test provided by FMF (Fetal Medicine Foundation). Additionally, 8092 deliveries were investigated from Ghudushauri National Center (GNC) (2020-2024 years). Patients who were common for ZSRC and GNC were excluded from study, thus only the patients from GNC who did not underwent first trimester screening of PE were selected.

537 pregnant women, who were conceived with artificial reproductive technology (In vitro fertilization and ovarian stimulation) were chosen as group l. 407 woman who had a spontaneous pregnancy were chosen as a control group (group II). Logistic regression was used to exclude confounding factors.

Results: In 01.01.2021 – 31.11.2025, 988 preeclampsia screening tests were performed at ZSRC. In 520 cases were confirmed a high risk (52.63%).

352 pregnant women who underwent first-trimester screening test were investigated. Results: 133 patient – fertile (37,8%), 219 patient – infertile (62,2%), 199 – low risk of PE (56,5%), 153 – high risk of PE (43,5%), 23 – case of PE (6,5%). No maternal or fetal death recorded.

GNC provided 8092 deliveries of unscreened pregnant women between 2020-2024 years. 931 cases of PE were recorded (11,5%). In 862 cases PE had complications (maternal and fetal death and s.o.)

For another direction of the study was created group 1 (women who were conceived with assisted reproductive technology) and it was separated into three subgroups. Subgroup 1 – method of conception in vitro fertilization (IVF) and frozen embryo transfer (FET) (240 women). Subgroup 2 - method of conception in vitro fertilization (IVF) and fresh embryo transfer (ET) (149 women). Subgroup 3 - method of conception – ovulation drugs (OVD) (148 women). For control group (group 2) were selected women with spontaneous pregnancy (407 women). The difference in subgroup 1 and subgroup 2 (IVF and FET vs IVF and ET) was not significant (p value = 0.47). The difference between group 1 and group 2 (Assisted reproductive technology vs spontaneous pregnancy) was significant (p value = 0.002).

Conclusion: First trimester screening of PE is very useful for further management of pregnant women. According to the results of our study, we conclude that, first trimester screening of PE is highly effective way to prevent development of PE in the third trimester. Frozen embryo transfer regimen does not make a difference for risk of preeclampsia, but assisted reproductive technology does make a difference.

Key words. Preeclampsia screening test, Infertility, ART, spontaneous pregnancy.

Introduction.

The reduction of maternal deaths is a key international development goal [1-4]. Hypertensive disorders are the most common medical complications during gestation [5]. PE is the second leading cause of maternal mortality worldwide [6]. The disease burden is borne disproportionately by women in low- and middle-income countries or who are otherwise disadvantaged [7,8]. Georgia is also recognized to be a middle-income country, thus screening of PE in the first trimester of pregnancy is very important for our population. Generally, PE is developed after 20 weeks of gestation and is characterized by hypertension and proteinuria [7]. Preeclampsia is divided into early-onset subtype (<34 weeks' gestation) and late-onset subtype (>34 weeks' gestation), which have distinct pathophysiology and different clinical manifestations [9]. In the FET-AC regimen for endometrial preparation, endometrial development is achieved through the administration of exogenous estrogen and progesterone without the formation of the endogenous corpus luteum (CL). Beyond estradiol and progesterone, CL is demonstrated to secrete kinds of vasoactive products, which play roles in maternal adaptation to pregnancy [10].

With the improvement of embryo cryopreservation technology, the use of frozen embryo transfer (FET) has been increasing worldwide [11]. Meanwhile, FET resulted in an increased risk of preeclampsia compared to fresh embryo transfer [12,13]. The underlying mechanism is still unclear [14]. Artificial cycles (FET-AC) regimen for endometrial preparation was associated with a higher risk of preeclampsia compared to other regimens for endometrial preparation [15-21].

Materials and Methods.

A prospective observational study was conducted at the Zurab Sabakhtarashvili Reproductive Clinic (ZSRC) on the pregnant women from 2021 (January)-2025 (November). All of the participants of the study in ZSRC underwent preeclampsia first-semester screening test provided by FMF (Fetal Medicine Foundation) in ZSRC. It included the recording of maternal

demographic characteristics, medical history, the measurement of serum placental growth factor, soluble fms-like tyrosine kinase-1 and mean arterial pressure [22]. PLGF and fms-like tyrosine kinase-1 test methodology: (SnibeDiagnostic X3 MAGLUMI® sFlt-1 (CLIA) X3 MAGLUMI® PLGF(CLIA) Fully Automated Chemiluminescence Immunoassay (CLIA) System). The kit is an in vitro chemiluminescence immunoassay for the quantitative determination of soluble fms-like tyrosine kinase-1 (sFlt-1) and placental growth factor in human serum using the MAGLUMI series fully automated chemiluminescence immunoassay and the Biolumi series integrated system. High-risk pregnant women were treated with 150 mg of acetylsalicylic acid from 12 to 36 weeks of pregnancy. Patients with a calculated risk of ≥1:100 for preterm preeclampsia were classified as high-risk and were prescribed 150 mg aspirin daily until 36 weeks of gestation. All patients were personally asked whether they took an aspirin according to prescription, only the ones who confirmed it were chosen for study. Additionally, 8092 deliveries were investigated from Ghudushauri National Center (GNC) (2020-2024 years). Patients who were common for ZSRC and GNC were excluded from study, thus only the patients from GNC who did not underwent first trimester screening of PE were selected.

To define an exact correlation between PE, screening test, preventive effect of aspirin and anamnesis of patients 249 patients' history from ZSRC and 103 patients' history from GNC were investigated carefully. Results are demonstrated in table 1.

Pregnant women who were conceived with assisted reproductive technology (group 1) were separated into three subgroups. Subgroup 1 – method of conception in-vitro fertilization (IVF) and frozen embryo transfer (FET) (240 women). Subgroup 2 - method of conception IVF and fresh embryo transfer (ET) (149 women). Subgroup 3 - method of conception – ovulation drugs (OVD) (148 women). For control group (group 2) were selected women with spontaneous pregnancy (407 women) (Table 2).

All 389 patients were transferred 5day embryos. On day 5 of embryo culture, the quality of blastocysts was assessed according to the Gardner morphological criteria [23].

Endometrial preparation program was programmed-FET. For patients in programmed-FET group, oral estradiol valerate was given on the second or third day of menstrual cycle, after confirming that patients were in the early proliferative phase for menstrual cycle. When the endometrial thickness reached at least 7 mm, progesterone at a dose of 90 mg once daily or micronized progesterone at a dose of 600 mg twice daily combined with oral dydrogesterone at a dose of 30 mg three times daily was added. If the thickness of the endometrium could not meet 7 mm, the dose of oral estradiol valerate was increased to 8 mg or by adding of one or two vaginal 17-βestradiol tablets. FET was scheduled for 4 days for cleavage-stage embryos and 6 days for blastocyst-stage embryos from the starting of progesterone.

Results are presented as forest plot with P values for the interaction effects, group sizes, event counts and estimated odds ratios [24]. The $\chi 2$ test for interaction was used to assess statistically significant ($P < .05$) differences effect between subgroups [25].

Results.

In 01.01.2021 – 31.11.2025, 988 preeclampsia screening tests were performed at ZSRC. In 520 cases were confirmed a high risk (52.63%).

352 pregnant women who underwent first-trimester screening test were investigated. Results: 133 patient – fertile (37,8%), 219 patient – infertile (62,2%), 199 – low risk of PE (56,5%), 153 – high risk of PE (43,5%), 23 – case of PE (6,5%) (Table 3).

No maternal or fetal death recorded between screened patients in ZSRC.

GNC had 8092 deliveries in 2020-2024 years. 931 cases of PE was recorded (11,5%) (Table 4).

In the second direction of our study – IVF and its effect on the risk of PE group 1 was separated into three subgroups. Subgroup 1 – method of conception in vitro fertilization and frozen embryo transfer (240 women). Subgroup 2 - method of conception in vitro fertilization and fresh embryo transfer (149 women). Subgroup 3 - method of conception – ovulation drugs (148 women). For control group were selected women with spontaneous pregnancy (407 women). Results: between 537 pregnant women ET occurred in 148 cases (38,3%), FET in 240 cases (61,7%). ET and low risk – 59 (39,6%), ET and high risk - 90 (60,4%), FET and low risk – 105 (43,75%) FET and FET and high risk – 135 (56,25%). 407 women with spontaneously conceived – 116 cases of high risk of PE (28,5%).

The difference in subgroup 1 and subgroup 2 (FET vs ET) was not significant (p value = 0.47). The difference between group 1 and group 2 (ART vs spontaneous pregnancy) was significant (p value = 0.002).

Table 1. *Correlation between PE, screening test, preventive effect of aspirin and anamnesis of patients 249 patients' history from ZSRC and 103 patients' history from GNC were investigated.*

	Total amount of patients	Healthy pregnant women	Pregnant women with endocrine disorder	Pregnant woman with high BMI	Pregnant women with systemic disorder	Pregnant women with anamnesis of PE	Pregnant women who were conceived with IVF	Pregnant women who were prescribed 150mg aspirin 12-36 gestation week
GNS	103	56 *(54,3%)*	5 *(4.8%)*	24 *(23.3)*	25 *(24.2)*	9 *(8.7%)*	27 *(26.2%)*	0
ZSRC	249	93 *(37.4%)*	150 *(60.2%)*	52 *(20.8%)*	8 *(3.2%)*	4 *(1.6%)*	91 *(36.5%)*	102 *(40.9%)*

	Low birth weight	Preterm delivery	PE developed	Maternal ICU placement	hysterectomy	Maternal death	Fetal death
GNS	96 *(93.2%)*	95 *(92.2%)*	103 *(100%)*	5 *(4.7%)*	5 *(4.7%)*	0	13 *(12.3%)*
ZSRC	11 *(4.4%)*	12 *(4.8%)*	14 *(5.6%)*	0	0	0	0

Table 2. *Pregnant women who were conceived with assisted reproductive technology (group 1) were separated into three subgroups.*

		method of conception	FET	ET	OVD	Number of patients	First trimester screening test of PE
Group 1	Subgroup 1	ART	√			240	√
	Subgroup 2	ART		√		149	√
	Subgroup 3	ART			√	148	√
Group 2 (control group)		spontaneous				407	√

Table 3. *Pregnant women who underwent first-trimester screening test were investigated.*

	P value	X^2	df	Adjusted Odds Ratio	95% confidence interval	Statistical correlation
Infertility →risk of PE	0.001	17.400	1	1.9	1.4 – 3.3	Very strong correlation
Infertility → PE	0.89	0.19	1	1.4	0.8 – 1.8	No correlation
Infertility → low fetal weight	0.229	1.446	1	1.2	0.5 – 1.3	No correlation
Infertility → preterm delivery	0.161	1.996	1	2.0	0.7 – 2.4	No correlation

Table 4. *GNC had 8092 deliveries in 2020-2024 years.*

year	Total number of deliveries	PE	hysterectomy	myomectomy	Fetal death	Maternal death	vacuum extraction
2020	2008	238	28	3	129	1	6
2021	1829	225	45	8	137	1	21
2022	1569	157	57	10	93	0	6
2023	1302	159	74	16	78	0	3
2024	1384	152	47	12	80	0	7
Total	8092	931	251	49	517	2	43

Discussion.

Our study demonstrates that doing preeclampsia screening test at 11-14 weeks of Gestation and administration of acetylsalicylic acid significantly reduces chances of developing preeclampsia in pregnant women, suggesting a potential role in improving pregnancy outcomes.

In 1996 McDuffie et al. published that no studies directly compared the effectiveness of preeclampsia screening in a screened population vs an unscreened population [26]. In 2009-2011 Poon et al. evaluated 7,797 women with singleton, first-trimester pregnancies attending clinics for routine care, with a 2% overall incidence of PE. The predictive model incorporated maternal factors, uterine artery Doppler, maternal MAP, PAPP-A, and PlGF. For a 5% false-positive rate, the sensitivity and specificity for early-onset PE were 93 and 94%, respectively [27,28].

In 2023 was found several immunological factors that also play a role in the development of the disease. During uncomplicated pregnancies, the ratio of T helper cells shifts towards the anti-inflammatory Th2 phenotype [29-31].

In addition to that with the improvement of embryo cryopreservation technology, the use of frozen embryo transfer (FET) has been increasing worldwide [32,33]. Meanwhile, FET resulted in an increased risk of preeclampsia compared to fresh embryo transfer [34-36]. Accumulating evidence indicated that artificial cycles (FET-AC) regimen for endometrial preparation was associated with a higher risk of preeclampsia compared to other regimens for endometrial preparation [37-48].

The corpus luteum (CL) produces estradiol and progesterone, which are essential for the maintenance of early pregnancy. Beyond steroid hormone secretion, the CL has been shown to produce various vasoactive substances that play an important role in maternal cardiovascular adaptation to pregnancy [49].

Whether frozen embryo transfer in an artificial cycle (FET-AC) influences the risk of preeclampsia (PE) remains controversial. The underlying mechanisms linking the FET-AC regimen to late-onset preeclampsia are still not fully understood. One proposed explanation is the absence of endogenous corpus luteum formation in FET-AC cycles [14].

Investigating the association between cycle regimens prior to FET and the risk of preeclampsia requires extremely large sample sizes, given the relatively low incidence of PE, estimated at approximately 1–9% [50]. One limitation of the present study is its small-to-medium sample size.

Further research is warranted to better elucidate the precise role of the corpus luteum in early pregnancy and its potential impact on the development of preeclampsia.

Conclusion.

Despite extensive research efforts and recent advances in prenatal screening, preeclampsia remains a major unresolved obstetric challenge.

Given the severity of the disorder, effective strategies for early screening and prevention of preterm preeclampsia are of critical importance.

First trimester screening of PE is very useful for further management of pregnant women.

No statistically significant difference was observed between FET and fresh embryo transfer (ET) cycles. Statistically significant difference was identified between spontaneous pregnancies and pregnancies achieved with ART.

We conclude that, first trimester screening of PE is important for an appropriate management of pregnancy, especially with anamnesis if infertility, the FET regimen itself does not appear to increase the risk of preeclampsia, whereas conception method ART is associated with a higher risk of developing the condition.

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