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ASSESSMENT OF SELECTED OBSTETRIC AND PERINATAL RISK FACTORS IN PATIENTS OF THE PREGNANCY PATHOLOGY DEPARTMENT WHO OVERCAME INFERTILITY USING ART

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ABSTRACT. In order to identify obstetric and perinatal risk factors, information was copied out from registration forms N 003/y for 820 patients in the pregnancy pathology department who had overcome infertility with the help of ART. It was found that in more than half of the cases, pregnancy occurred on the second or after several more attempts at using ART (56.1%), in most cases it was the first birth (76.8%). The proportion of patients of early reproductive age was 67.8%. The diagnosis of infertility was made before the age of 35 in 77.5% of women. In most cases, it was primary infertility (61.0%) and in 59.9% of patients, the diagnosis was established after 5 or more years of absence of pregnancy in the absence of contraception (on average, at the age of 30.04±2.72 years). On average, the period of infertility in patients was 6.18±0.19 years. 41.5% of women had a history of abortion. The proportion of abortions for medical reasons in this category of patients was 15.3 times higher than the population average, the proportion of spontaneous abortions was 1.5 times higher, and the proportion of abortions in primigravidas was 2.8 times. The most common pregnancy complications were gestational diabetes mellitus (30.49%), preeclampsia (25.12%) and complications caused by infectious diseases during pregnancy (20.73%). The most common extragenital diseases of these pregnant women were myopia (40.73%), anemia (38.78%) and thyroid diseases (35.37%). Fetal pathology was detected in 20.5% of patients. The most common reasons for hospitalization in the department were delivery by caesarean section (44.6%) and premature birth (25.9%). At the same time, natural delivery was observed only in 15.7% of patients with ART. Thus, the study made it possible to establish that patients in the Department of Pregnancy Pathology, whose pregnancies followed after the use of ART, had a significant number of obstetric and perinatal risk factors, which requires closer attention to the course of pregnancy and childbirth on the part of obstetrician-gynecologists.

KEYWORDS: pregnant women, infertility, assisted reproductive technologies, Department of Pregnancy Pathology, obstetric and perinatal risk

ОЦЕНКА ОТДЕЛЬНЫХ ФАКТОРОВ АКУШЕРСКОГО И ПЕРИНАТАЛЬНОГО РИСКА У ПАЦИЕНТОК ОТДЕЛЕНИЯ ПАТОЛОГИИ БЕРЕМЕННОСТИ, ПРЕОДОЛЕВШИХ БЕСПЛОДИЕ С ПОМОЩЬЮ ВРТ

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РЕЗЮМЕ. С целью выявления факторов акушерского и перинатального риска была проведена выкопировка сведений из учетных форм № 003/у на 820 пациенток отделения патологии беременности, преодолевших бесплодие с помощью вспомогательных репродуктивных технологий (ВРТ). Установлено, что более чем у половины пациенток беременность наступила со второй и более попытки применения ВРТ (56,1%), при этом в большинстве случаев это были первые роды (76,8%). Удельный вес пациенток раннего репродуктивного возраста составил 67,8%. Диагноз «бесплодие» был поставлен до 35 лет у 77,5% женщин. В большинстве случаев это было первичное бесплодие (61,0%), и у 59,9% пациенток диагноз был установлен через 5 лет и более отсутствия беременности в условиях отсутствия контрацепции (в среднем в возрасте 30,04±2,72 года). В среднем срок бесплодия у пациенток составлял 6,18±0,19 года. В анамнезе у 41,5% женщин были аборты. Удельный вес абортов по медицинским показаниям у данной категории пациенток был выше, чем в среднем по популяции, в 15,3 раза, удельный вес самопроизвольных абортов — в 1,5 раза, а удельный вес абортов у первобеременных — в 2,8 раза. Наиболее частыми осложнениями беременности были гестационный сахарный диабет (30,49%), преэклампсия (25,12%) и осложнения, вызванные инфекционными заболеваниями во время беременности (20,73%). Самые распространенные экстрагенитальные заболевания, которые были у этих беременных, — это миопия (40,73%), анемия (38,78%) и заболевания щитовидной железы (35,37%). У 20,5% пациенток была выявлена патология плода. Наиболее частыми причинами госпитализации в отделение стали родоразрешение с помощью кесарева сечения (44,6%) и преждевременные роды (25,9%). При этом естественное родоразрешение наблюдалось только у 15,7% пациенток с ВРТ. Таким образом, проведенное исследование позволило установить наличие значительного количества факторов акушерского и перинатального риска у пациенток отделения патологии беременности, беременность которых наступила с применением ВРТ, что требует более пристального внимания к течению беременности и родов у них со стороны врачей — акушеров-гинекологов.

КЛЮЧЕВЫЕ СЛОВА: беременные, бесплодие, вспомогательные репродуктивные технологии, отделение патологии беременности, акушерский и перинатальный риск

INTRODUCTION

According to the Federal Law “On Fundamentals of Citizens’ Health Protection in the Russian Federation” [1], the creation of optimal conditions for a woman to fulfil her most important social function — to give birth to and raise healthy children — is one of the main tasks of the system of maternal and child health care. In the context of declining birth rates, the problem of population reproduction is especially important. One of the main medical and social

problems of society is infertility. It is actual both in our country and abroad [2]. According to special studies, the number of infertile couples in Russia is about 20%. At the same time, some international experts cite figures of 24–25% [3].

According to the WHO classification, infertility can be caused by male and female factors, or their combination, as well as by undetermined etiology. In addition, infertility is divided into primary and secondary, absolute and relative [4]. An effective method of infertility treatment is assisted reproductive technologies (ART). More than ten methods of ART are used in medical practice: *in vitro* fertilization (IVF), intracytoplasmic sperm injection (ICSI), surrogacy, reproductive donation, cryopreservation and others. However, the most common method is IVF [5].

According to the clinical guidelines "Female Infertility", the indications for IVF are absolute infertility (absence of uterus, ovaries, absence or obstruction of both fallopian tubes, azoospermia, etc.), as well as a higher probability of overcoming infertility with IVF compared to other methods [6]. In addition, the use of ART is reasonable if there is no pregnancy in women under 35 years old during 12 months of infertility treatment or during 6 months in women older than 35.

In our country, the medical care for women during pregnancy, childbirth and the postpartum period is carried out in accordance with medical care procedures for the profile "Obstetrics and gynecology" [7]. It is based on the principles of continuity and stages. Prevention is a priority during a medical follow-up of pregnant women, which includes identifying women at risk for prevention and early detection of complications associated with pregnancy, childbirth and the postnatal period. If pregnant women require round-the-clock observation and treatment, they are hospitalized in the pregnancy pathology departments of obstetric hospitals. Their objectives are the detection and treatment of pregnancy pathology; prevention of complications during pregnancy; preparation for childbirth, in particular — for caesarean section, counselling and psychological support, etc.

A significant proportion of women whose pregnancies are achieved using IVF have other health problems in addition to problems in the reproductive system [8]. Accordingly, the study of their medical and social characteristics can determine the profile of the target group. In this case, it is necessary to adjust the plan of medical supervision in order to reduce complications during pregnancy and childbirth [9]. Thus, the assessment of individual obstetric and perinatal risk factors in patients of the Department of Pregnancy Pathology who have overcome infertility by means of ART is a relevant topic for research.

AIM

To determine the obstetric and perinatal risk factors in patients of the Department of Pregnancy Pathology who overcame infertility by means of ART.

MATERIALS AND METHODS

The Department of Pregnancy Pathology of the Perinatal Centre of the Federal State Budgetary Educational Institution of Higher Professional Education 'St. Petersburg State Pediatric Medical University' of the Ministry of Health of Russia, which belongs to the third-level obstetric hospitals, became the clinical base of the research. A special form was designed in order to assess the characteristics of patients who overcame infertility with the help of ART. The form "Card of medical and social examination of women suffering from infertility" includes information which was copied from 820 registration forms No. 003/u "Medical card of a patient receiving medical care in inpatient and day hospital conditions". All patients were treated at the Department of the Pregnancy Pathology, their hospitalization ended with delivery at the perinatal center of the St. Petersburg State Pediatric Medical University in 2018–2024. Women permanently residing in St. Petersburg were selected for the study.

Extensive indicators, arithmetic weighted average and its error were calculated. The obtained indicators were compared with the data of official statistics [10–14]. Perinatal risk factors in patients were assessed according to the perinatal risk scale proposed by V.E. Radzinsky [9].

The significance of the differences between the indicators was assessed using Student's t-criterion. Differences were considered significant at $p < 0.05$. Statistical processing of data was performed using MS Office 2016 and STATISTICA 10.0 (StatSoft Inc.) software packages.

RESULTS

Assessment of the age distribution of patients who overcame infertility with the help of ART showed that 65.6% of the pregnant women belonged to the age group of 35 years and older, which was significantly higher than the proportion of patients under 35 years of age ($p < 0.05$), their proportion in the age structure of the department was 2.0 times lower (32.2%). The mean age of the patient whose pregnancy was induced by ART was 37.00±0.30 years.

The study revealed (Fig. 1) that the most common age when infertility was diagnosed was 25–34 years (67.2%), which was significantly higher than the proportion of patients both under 25 years and over 35 years ($p < 0.05$). The mean age of infertility diagnosis in patients was 30.71±0.26 years.

Perinatal risk factors include infertility for 2–4 years and for 5 years or more. It was found that only 1.3% of the patients who overcame infertility with the help of ART were diagnosed with infertility for 1 year or less. The diagnosis period of 2–4 years occurred in 38.8% of women. More than half of the patients — 59.9% — had a diagnosis for 5 years or more, including 10–14 years — 19.0% and 15 years or more — 3.9%. The mean duration of infertility in patients was 6.18±0.19 years.

The type of infertility was of particular importance. "Primary infertility" was diagnosed in women who had no history of pregnancy despite regular sexual activity for a year without contraceptives. Secondary infertility is established in women who had a history of pregnancy but had not conceived during a year of regular sexual activity. Primary infertility was present in 61.0% of the patients whose pregnancies were induced by ART. Secondary infertility was diagnosed in 39.0% of the patients. The distribution of patients by type of infertility is shown in Figure 2.

Pregnancy occurred with the use of ART, refers to anamnestic risk factors, and the use of ICSI method in comparison with IVF has a higher number of perinatal risk scores. All patients in the study group became pregnant through IVF. Most of the patients had a history of one or two IVF attempts (43.9% and 23.2%, respectively). 32.9% of women had three or more attempts. On average, patients had 2.46±0.11 IVF attempts (Fig. 3).

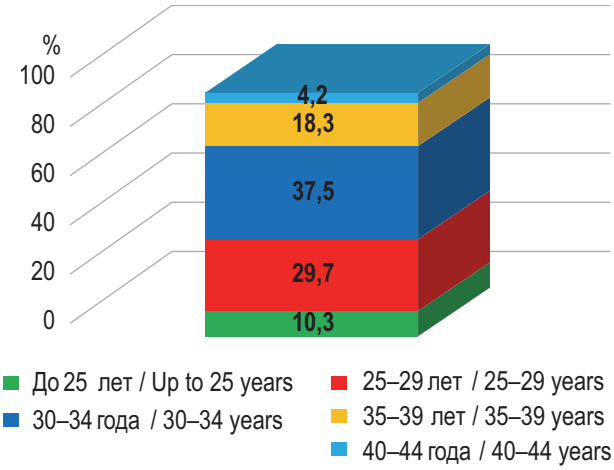

Fig. 1. Distribution of patients by the age of diagnosis of "infertility" made (in % of total)

Рис. 1. Распределение пациенток по возрасту постановки диагноза «бесплодие» (в % к итогу)

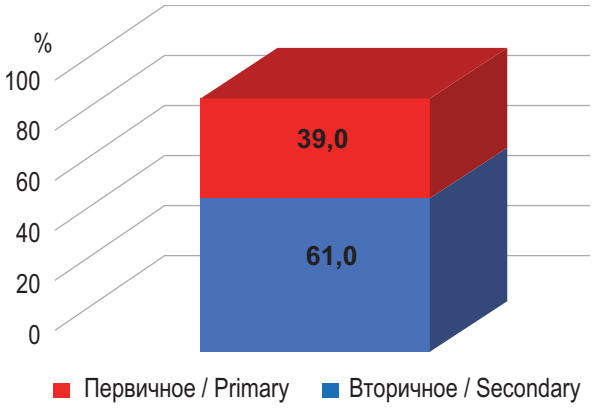

Fig. 2. Distribution of patients by type of infertility (in % of total)

Рис. 2. Распределение пациенток по виду бесплодия (в % к итогу)

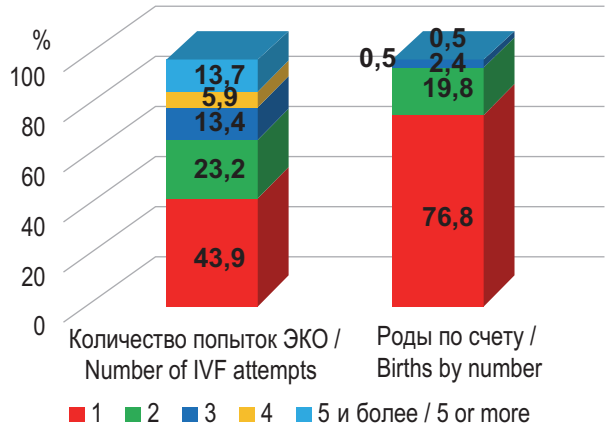

Fig. 3. Distribution of patients by number of IVF attempts and amount of births on the account (in % of total)

Рис. 3. Распределение пациенток по количеству попыток ЭКО и родов по счету (в % к итогу)

In addition, perinatal risk factors include obstetric and gynecological history of the mother, including parity of 4–7 births and 8 births or more. It was revealed that the majority of the studied contingent had first births as a result of ART (76.8%) and only 1.0% of patients had fourth births and more.

Assessment of the fetus takes a separate place in forming a strategy of perinatal risk factors. The study revealed that fetal pathology occurred in every fifth patient who overcame infertility with the help of ART (20.5%) (Fig. 4).

A history of abortion in a pregnant woman can also increase obstetric and perinatal risks. Abortion history was present in 41.5% of patients (Fig. 5). The majority of pregnancy terminations were related to maternal and fetal health (75.1%), including 44.5% of medically indicated abortions and 30.6% of spontaneous abortions. However, 24.9% of women had a history of medical legal abortion or voluntary termination of pregnancy. Considering that the proportion of elective abortions in the general population is 45.4%, and 58.5% of the patients in our study had no history of abortion, this type of pregnancy termination is not typical for women who overcame infertility with the help of ART. At the same time, the proportion of abortions for medical reasons in this category of pregnant women is 15.3 times higher than the national average (2.9% in Russia; $p < 0.05$), and the proportion of miscarriages is 1.5 times higher (20.0% in Russia; $p < 0.05$). The study showed that the proportion of abortions due to medically indicated undeveloped pregnancies was 22.5% of all abortions or 50.6% of medically indicated abortions.

Abortion in first-pregnant women is considered to be the most significant risk factor for perinatal pathology among abortions. Our study showed that 30.1% of the patients' first pregnancy ended with abortion. The percentage of abortions in first-pregnant women was 2.8 times higher than the average according to official statistics (10.8% in Russia; $p < 0.05$).

Every fifth woman had complications caused by infectious diseases, including covid or acute respiratory diseases (20.73 cases per 100 hospitalized patients). Whereas the most frequent diseases were gestational diabetes mellitus (30.49%) and pre-eclampsia (25.12%). Gestational diabetes mellitus was 1.7 times less frequent among pregnant women in the metropolis (17.71% in St. Petersburg; $p < 0.05$), and severe and moderate pre-eclampsia was 7.0 times less frequent (3.57% in St. Petersburg; $p < 0.05$).

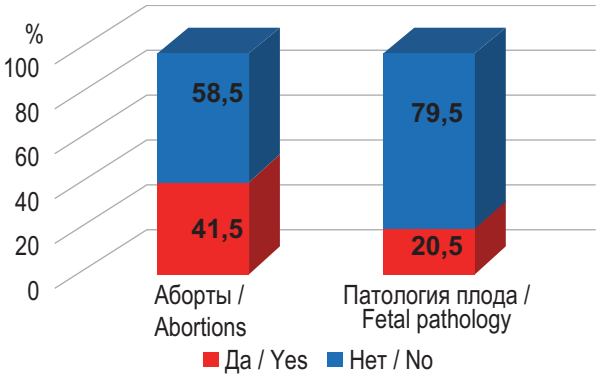

Fig. 4. Distribution of patients by history of abortion and fetal pathology in the current pregnancy (in% of total)

Рис. 4. Распределение пациенток по наличию абортов в анамнезе и патологии плода в настоящую беременность (в% к итогу)

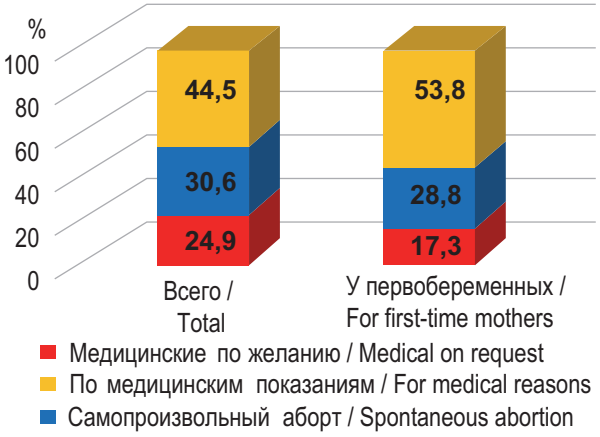

Fig. 5. Distribution of patients by type of abortion history (in% of total)

Рис. 5. Распределение пациенток по видам абортов в анамнезе (в% к итогу)

Extragenital maternal diseases are important obstetric and perinatal risk factors, namely: cardiovascular diseases (heart defects with and without circulatory disorders, chronic arterial hypertension stage I–II–III, varicose veins, hypotensive syndrome), kidney diseases, endocrinopathies (adrenal diseases, neuro-exchange endocrine syndrome, diabetes mellitus, thyroid diseases, obesity), anemia, myopia and other eye diseases, chronic specific infections (tuberculosis, brucellosis, toxoplasmosis, etc.), and coagulopathies [10]. It was found (Tables 1, 2) that myopia and anemia (40.73 and 38.78 per

Table 1

Frequency of pregnancy complications in patients (per 100 hospitalized patients who completed pregnancy)

Таблица 1

Частота осложнений беременности у пациенток (на 100 госпитализированных, закончивших беременность)

Нозологическая форма / Nosological form	Абс. / Abs.	В% / In%
Гестационный сахарный диабет / Gestational diabetes mellitus	250	30,49
Преэклампсия / Preeclampsia	206	25,12
Осложнения, вызванные инфекционными заболеваниями во время беременности (в том числе ковидом или острыми респираторными заболеваниями) / Complications caused by infectious diseases during pregnancy (including Covid or acute respiratory diseases)	170	20,73
Патология плаценты / Pathology of the placenta	152	18,54
Истмико-цервикальная недостаточность / Isthmic-cervical insufficiency	112	13,66
Маловодие / Low water	42	5,12
Многоводие / Polyhydramnios	30	3,66

100 hospitalized patients, respectively) and thyroid diseases (35.37%) were the most common extragenital diseases in the observed patients. It was found that endocrine diseases in these patients were 2.1 times more common than the average for pregnant women in St. Petersburg (17.17% in St. Petersburg; $p < 0.05$), venous complications were 1.6 times more common (14.5% in St. Petersburg; $p < 0.05$), and genitourinary diseases were 1.3 times more common (19.6% in St. Petersburg; $p < 0.05$).

The majority of patients in the Department of Pregnancy Pathology who overcame infertility with the help of ART had singleton pregnancies (88.8%). Multiple pregnancies occurred in 11.3% of pregnant women: two fetuses in 10.5% and three fetuses in 0.7%.

More than half of the women who became pregnant using ART (Fig. 6) delivered at term (65.9%). Accordingly, 34.5% of the patients underwent surgical delivery by caesarean section, of whom 18.4% had an emergency caesarean section (i.e. 184 per 1,000). Taking into account that caesarean section rate in St. Petersburg amounts to 270.8 operative deliveries per 1000 deliveries, caesarean section was used 1.5 times more often among this category of patients ($p < 0.05$).

Table 2

Frequency of extragenital pathology in patients (per 100 hospitalized patients who completed pregnancy)

Таблица 2

Частота экстрагенитальной патологии у пациенток (на 100 госпитализированных, закончивших беременность)

Нозологическая форма / Nosological form	Абс. / Abs.	В% / In%
Миопия / Myopia	334	40,73
Анемия / Anemia	318	38,78
Болезни эндокринной системы (заболевания щитовидной железы) / Diseases of the endocrine system (thyroid diseases)	290	35,37
Заболевания мочеполовой системы / Diseases of the genitourinary system	216	26,34
Варикозная болезнь / Varicose veins	194	23,66
Нарушение в системе гемостаза / Disturbance in the hemostasis system	150	18,29
Миома матки / Uterine fibroids	140	17,07
Прочие заболевания / Other diseases	412	50,24

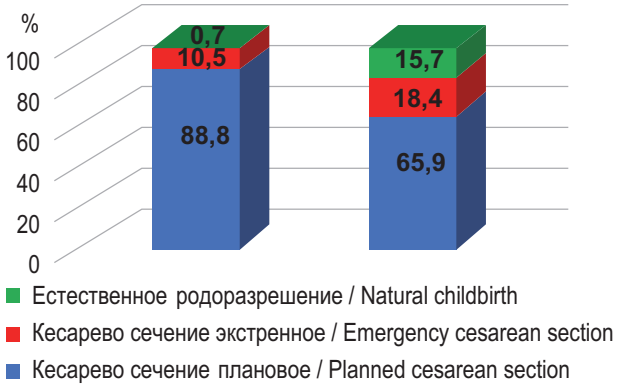

Fig. 6. Distribution of patients by number of fetuses and nature of delivery (% of total)

Рис. 6. Распределение пациенток количеству плодов и характеру родоразрешения (в% к итогу)

CONCLUSION

1. More than half of the patients had a pregnancy after the second or more IVF attempts (56.1%), in most cases it was the first birth (76.8%).

2. The proportion of patients of early reproductive age was more than half (67.8%), and 77.5% of women were diagnosed with infertility before the age of 35 years.

3. Most of the cases were primary infertility (61.0%). The mean age of primary infertility

was 30.04±2.72 years and secondary infertility was 31.04 ± 1.95 years.

4. More than half of the patients were diagnosed with infertility after 5 or more years of attempts without contraception (59.9%), and the mean age of infertility was 6.18±0.19 years.

5. 41.5% of women had a history of abortion. The proportion of abortions for medical reasons in this category of patients was higher than the population average by 15.3 times, spontaneous abortions by 1.5 times, and abortions in first-pregnant women by 2.8 times.

6. The most common complications of pregnancy were gestational diabetes mellitus, pre-eclampsia and complications due to infectious diseases during pregnancy. The most common extragenital pathologies in the patients were myopia, anemia and thyroid diseases. Fetal pathology was detected in 20.5% of the patients.

7. In comparison with the morbidity of metropolitan pregnant women, these patients suffered from severe and moderate pre-eclampsia 7.0 times more often, from gestational diabetes mellitus — 1.7 times more often, endocrine system diseases — 2.1 times, venous complications — 1.6 times, genitourinary system diseases — 1.3 times.

8. The most frequent reasons for hospitalization were caesarean section delivery (44.6%) and premature delivery (25.9%). Only 15.7% of IVF patients had natural delivery.

Thus, the study revealed that patients who underwent IVF had a significant number of obstetric and perinatal risk factors. It demands from obstetricians and gynecologists to focus more attention on the course of pregnancy and childbirth in this category of patients.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

Competing interests. The authors declare that they have no competing interests.

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Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

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REFERENCES

1. Federal'nyj zakon Rossijskoj Federacii ot 21.11.2011 g. N 323-FZ. Ob osnovah ohrany zdorov'ya grazhdan v Rossijskoj Federacii. Available at: https: // www.consultant.ru/document/cons_doc_LAW_121895/ (accessed: 23.04.2024). (In Russian).
2. Yur'yev V.K., Moiseyeva K.Ye., Glushchenko V.A. Fundamentals of public health and healthcare. Textbook. Saint Petersburg: SpetsLit; 2019. (In Russian).
3. Radynova S.B., Lodyreva M.S., Kenyaykina A.G., Gorbunova K.A. Characteristics of the main causative factors in the development of infertility. Colloquium-journal. 2019;10(34). Available at: https:/cyberleninka.ru/article/n/harakteristika-osnovnyh-prichinnyh-faktorov-razvitiya-besplodiya (accessed: 23.04.2024). (In Russian).
4. WHO. Available at: //www.who.int/ru/health-topics/infertility#tab=tab_1 (accessed: 23.04.2024). (In Russian).
5. Prikaz Minzdrava Rossii ot 31.07.2020 N 803n "O poryadke ispol'zovaniya vspomogatel'nykh reproduktivnykh tekhnologiy, protivopokazaniyakh i ogranicheniyakh k ikh primeneniyu". Available at: https://www.garant.ru/products/ipo/prime/doc/74676088/?ysclid=lvffj4y2bi260095140 (accessed: 23.04.2024). (In Russian).
6. Female infertility. Clinical recommendations. Russian Society of Obstetricians and Gynecologists (ROAG). Moscow; 2021. (In Russian).
7. Prikaz Minzdrava Rossii ot 20.10.2020 N 1130n "Ob utverzhdenii Poryadka okazaniya meditsinskoy pomoshchi po profilyu «akusherstvo i ginekologiya»". Available at: https://docs.cntd.ru/document/566162019?ysclid=lo30ib3c8k800071923 (accessed: 23.04.2024). (In Russian).
8. Sinotova S.L., Limanovskaya O.V., Plaksina A.N., Makutina V.A. Application of correlation analysis to identify factors from a woman's history that influence the outcome of pregnancy obtained through IVF. Modeling, optimization and information technology. 2020;8(3):1–13. (In Russian).

9. Radzinskiy V.Ye., Knyazev S.A., Kostin I.N. Obstetric risk. Maximum information — minimum danger for mother and baby. Moscow: Eksmo-Press; 2009. (In Russian).
10. Main indicators of maternal and child health, activities of child welfare and obstetric services in the Russian Federation. Statistical materials. Moscow: FGBU "TSNIIOIZ" Minzdrava Rossii; 2019. (In Russian).
11. Main indicators of maternal and child health, activities of child welfare and obstetric services in the Russian Federation. Statistical materials. Moscow: FGBU "TSNIIOIZ" Minzdrava Rossii; 2020. (In Russian).
12. Main indicators of maternal and child health, activities of child welfare and obstetric services in the Russian Federation. Statistical materials. Moscow: FGBU "TSNIIOIZ" Minzdrava Rossii; 2021. (In Russian).
13. Main indicators of maternal and child health, activities of child welfare and obstetric services in the Russian Federation. Statistical materials. Moscow: FGBU "TSNIIOIZ" Minzdrava Rossii; 2022. (In Russian).
14. Main indicators of maternal and child health, activities of child welfare and obstetric services in the Russian Federation. Statistical materials. Moscow: FGBU "TSNIIOIZ" Minzdrava Rossii; 2023. (In Russian).

ЛИТЕРАТУРА

1. Федеральный закон от 21.11.2011 № 323-ФЗ «Об основах охраны здоровья граждан в Российской Федерации». Доступен по: http://www.consultant.ru/document/cons_doc (дата обращения: 23.04.2024).
2. Юрьев В.К., Моисеева К.Е., Глущенко В.А. Основы общественного здоровья и здравоохранения. Учебник. СПб.: СпецЛит; 2019.
3. Радынова С.Б., Лодырева М.С., Кеняйкина А.Г., Горбунова К.А. Характеристика основных причинных факторов развития бесплодия. Colloquium-journal. 2019:10(34). Доступен по: https://cyberleninka.ru/article/n/harakteristika-osnovnyh-prichinnyh-faktorov-razvitiya-besplodiya (дата обращения: 23.04.2024).
4. ВОЗ. Доступен по: https://www.who.int/ru/health-topics/infertility#tab=tab_1 (дата обращения: 23.04.2024).
5. Приказ Минздрава России от 31.07.2020 № 803н «О порядке использования вспомогательных репродуктивных технологий, противопоказаниях и ограничениях к их применению». Доступно по: https://www.garant.ru/products/ipo/prime/doc/74676088/?ysclid=lvffj4y2bi260095140 (дата обращения: 23.04.2024).
6. Женское бесплодие. Клинические рекомендации. Российское общество акушеров-гинекологов (РОАГ). М.; 2021.
7. Приказ Минздрава России от 20.10.2020 № 1130н «Об утверждении Порядка оказания медицинской помощи по профилю «акушерство и гинекология». Доступно по: https://docs.cntd.ru/document/566162019?ysclid=lo30ib3c8k800071923 (дата обращения: 23.04.2024).
8. Синотова С.Л., Лимановская О.В., Плаксина А.Н., Макутина В.А. Применение корреляционного анализа для выявления факторов из анамнеза женщины, влияющих на исход беременности, полученной с помощью ЭКО. Моделирование, оптимизация и информационные технологии. 2020;8(3):1–13.
9. Радзинский В.Е., Князев С.А., Костин И.Н., 2011 Акушерский риск. Максимум информации — минимум опасности для матери и младенца. М.: Эксмо-Пресс; 2009.
10. Основные показатели здоровья матери и ребенка, деятельность службы охраны детства и родовспоможения в Российской Федерации. Статистические материалы. М.: ФГБУ «ЦНИИОИЗ» Минздрава России; 2019.
11. Основные показатели здоровья матери и ребенка, деятельность службы охраны детства и родовспоможения в Российской Федерации. Статистические материалы. М.: ФГБУ «ЦНИИОИЗ» Минздрава России; 2020.
12. Основные показатели здоровья матери и ребенка, деятельность службы охраны детства и родовспоможения в Российской Федерации. Статистические материалы. М.: ФГБУ «ЦНИИОИЗ» Минздрава России; 2021.
13. Основные показатели здоровья матери и ребенка, деятельность службы охраны детства и родовспоможения в Российской Федерации. Статистические материалы. М.: ФГБУ «ЦНИИОИЗ» Минздрава России; 2022.
14. Основные показатели здоровья матери и ребенка, деятельность службы охраны детства и родовспоможения в Российской Федерации. Статистические материалы. М.: ФГБУ «ЦНИИОИЗ» Минздрава России; 2023.