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CESAREAN SECTION - A PATHOLOGICAL PATTERN OF THE MOTHER AND THE NEWBORN

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Abstract. Introduction. The increase in the frequency of cesarean sections (CS) in Ukraine and worldwide is of great interest and importance for public health. The rate of elective and repeat cesarean sections has also been steadily increasing since the late 1990s, including the growing trend of performing cesarean sections at maternal request.

Objective of the study. To assess the impact of the frequency of cesarean sections on maternal and perinatal morbidity and mortality.

Materials and Methods. An analysis of domestic and foreign scientific literature over the past ten years was conducted on the topic of cesarean section in childbirth based on an information search in bibliographic databases: PubMed, Web of Science, Scopus, Springer, Acronym Finder, ACP Journal Club, American College of Obstetricians and Gynecologists (ACOG).

Results of the study. Analysis of the scientific literature showed that the increase in the frequency of CS significantly affects the occurrence of postoperative complications in both mothers and newborns. Although the incidence of complications such as asphyxia, meconium aspiration, and hypoxic-ischemic encephalopathy decreases, a significant number of newborns delivered by CS develop respiratory failure and require additional measures such as mechanical ventilation, oxygen therapy, and the use of surfactant preparations.

Conclusions. It has been proven that cesarean section is associated with a higher risk of respiratory failure in newborns and fetal trauma, but also with a potential reduction in the risk of brachial plexus injury, neonatal sepsis, and neonatal encephalopathy. To reduce perinatal mortality, the efforts of obstetricians-gynecologists and neonatologists should be directed towards antenatal fetal protection and reducing the frequency of cesarean sections.

Key words: cesarean section, maternal complications, newborns, perinatal outcomes.

Кесарів розтин – патологічний патерн породіллі та новонародженого

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Резюме. Вступ. Збільшення частоти кесаревого розтину (КР) в Україні і в усьому світі викликає величезний інтерес і значення для громадської охорони здоров'я. Частота планового та повторного кесаревого розтину також неухильно зростає, починаючи з кінця 1990-х років, що включає в себе і зростаючу тенденцію до виконання кесаревого розтину за материнським запитом.

Мета дослідження. Оцінити вплив частоти кесаревих розтинів на материнську та перинатальну захворюваність і смертність.

Матеріали та методи. Проведено аналіз літературних джерел вітчизняної та зарубіжної наукової літератури за останні десять років із тематики застосування кесаревого розтину при родорозрішенні на основі інформаційного пошуку у бібліографічних базах даних: PubMed, Web of Science, Scopus, Springer, Acronym Finder, ACP Journal Club, American College of Obstetricians and Gynecologist (ACOG).

Результати досліджень. Аналіз наукової літератури показав, що збільшення частоти КР значно впливає на виникнення післяопераційних ускладнень як з боку матері, так і новонародженого. Хоча частота виникнення таких ускладнень, як асфіксія, аспірація меконію та гіпоксична ішемічна енцефалопатія знижується, але у значного числа новонароджених шляхом КР розвивається дихальна недостатність і вони потребують додаткових заходів, таких як штучна вентиляція легень, оксигенація, застосування препаратів сурфактанту.

Висновки. Доведено, що кесарів розтин пов'язаний із більшим ризиком виникнення дихальної недостатності у новонароджених і травмування плода, але також із потенційним зниженням ризику травми плечового сплетіння, неонатального сепсису і неонатальної енцефалопатії. Для зниження перинатальної смертності зусилля акушер-гінекологів та неонатологів повинні бути направлені на антенатальну охорону плода та зниження частоти застосування кесаревого розтину.

Ключові слова: кесарів розтин, материнські ускладнення, новонароджені, перинатальні наслідки.



Introduction

The frequency of cesarean sections (CS) worldwide is quite variable. In Austria, Bulgaria, Denmark, and Norway, this operation accounts for no more than 15% of all deliveries, while in Brazil, Mexico, Thailand, and Chile it exceeds 30%, reaching 70% in some medical institutions [1]. In Ukraine, the frequency of CS in various maternity hospitals ranges from 12 to 27% of all deliveries. Since 2006, there has been an increase in perinatal mortality in Ukraine along with a rise in the frequency of CS above 14%, and an increase in mortality among women who were delivered operatively [2]. From 1970 to 2009, the CS rate in the USA rose from 5.5% to 32.9%, representing a 600% increase. It is expected that in the twenties of the 21st century, the percentage of CS will reach 56%, meaning that more than every second pregnancy will be delivered via CS [3].

This increase in CS frequency is mainly due to the expansion of indications for elective CS and the reduction of operative risk. In 2000, the American College of Obstetricians and Gynecologists (ACOG) published two goals related to cesarean sections that were to be achieved [4]:

1. To reduce the CS rate among primiparas with cephalic presentation at term (≥ 37 weeks) by 15.5%.
2. To increase the rate of vaginal births after cesarean (VBAC) among women with one previous CS by 37%. Neither of these goals has been achieved. In the USA, the rate of repeat CSs reaches 40%.

Among the many reasons for the increasing CS rate, the following can be distinguished:

- an increase in the number of older primiparous women with complicated obstetric histories,
- an increase in multiple pregnancies due to infertility treatment,
- concerns of both doctors and pregnant women about possible risks of vaginal delivery in certain situations.

The rise in CS deliveries in recent years is also due to the fact that women with a previous CS have a more than 90% probability of undergoing another CS in subsequent pregnancies, thus increasing the total number of CSs in the future [5,6].

After analyzing recent studies, the four most common indications for repeat CSs in developed countries are [7]:

1. Previous pregnancy delivered by CS;
2. Abnormal labor;

3. Fetal distress;
4. Breech presentation.

A study conducted by the WHO showed that an increase in CS rates is associated with a higher frequency of antibiotic prescriptions in the postpartum period, an increase in severe maternal morbidity and mortality.

An increase in CS rates above 15% is not recommended by the WHO because it does not affect the reduction of perinatal morbidity and mortality compared to infants born naturally [1,6].

Objective of the study

To assess the impact of the frequency of cesarean sections on maternal and perinatal morbidity and mortality.

Materials and Methods

An analysis of domestic and foreign scientific literature over the past ten years was conducted on the topic of cesarean section in childbirth based on an information search in bibliographic databases: PubMed, Web of Science, Scopus, Springer, Acronym Finder, ACP Journal Club, American College of Physicians (ACP).

Results of the study

According to researchers' observations, cesarean sections are performed more often for urgent reasons (14.4%) and electively (5.8%) in the structure of deliveries. The conducted analysis shows that the risk group for operative delivery includes multiparous women (54%) with a previous CS. The indications for CS are as follows [1,7]:

1. Uterine scar;
2. Clinically narrow pelvis;
3. Ineffectiveness of labor stimulation;
4. High-grade myopia with degenerative changes on the fundus;
5. Oblique or transverse fetal position in twin pregnancies;
6. Fetal distress;
7. Severe preeclampsia;
8. Premature detachment of a normally located placenta.

Possible maternal risks associated with CS include early and late postpartum hemorrhages, wound infections, endometritis, septic conditions, hematomas, injuries to adjacent organs, thromboembolism, anesthetic complications, hypogalactia, lochiometra, uterine subinvolution, and uterine rupture during subsequent deliveries.



Moreover, the percentage of all complications increases with the number of repeated CS a woman undergoes. Postoperative delivery also increases the risk of placenta previa and placenta accreta in subsequent pregnancies, as well as the risk of premature placental abruption [1,7,8].

The most common complications are bleeding in the early postpartum period and the need for blood and plasma substitute transfusions. A higher frequency of complications is observed mainly in cases of unplanned surgeries. Also, the average frequency of complications is more common in patients who received general anesthesia compared to pregnant women who received regional anesthesia. Thanks to the use of modern broad-spectrum antibiotics in the postoperative period, purulent-septic complications are avoided in the vast majority of cases [7,8,9].

Many specialists believe that children born by cesarean section have less developed adaptation mechanisms, a higher risk of neurological and respiratory pathology, as well as food allergies. In full-term infants, respiratory complications most often manifest as transient tachypnea of the newborn, although more serious disorders such as respiratory distress syndrome and persistent pulmonary hypertension can also occur [7,8]. Researchers indicated in their own studies that newborns delivered by cesarean section at 37 weeks of gestation had a 10% incidence of respiratory morbidity compared to 2.8% among those born vaginally. In this and other studies, it was proven that the risk of respiratory failure in newborns decreases with increasing gestational age of the fetus [9,10,11].

The proposed mechanisms linking cesarean section and neonatal respiratory morbidity include iatrogenic factors (deficiency of surfactant supply) and low levels of catecholamines in the fetal blood during operative delivery [12,13]. Some authors report a reduction in respiratory system complications in newborns when cesarean section is performed after the onset of labor. This prompted researchers to recommend delaying elective cesarean section until the onset of spontaneous labor [14].

Proponents of cesarean section believed that this «atraumatic» delivery method should reduce the risk of intrapartum neurological complications and cerebral palsy [15]. Some researchers highlight among the advantages of planned cesarean section only the reduction in the frequency of brachial plexus paresis. Shoulder dystocia leads to brachial plexus injury

and remains a dangerous complication of vaginal delivery. Shoulder dystocia is extremely difficult to predict, despite identifying risk factors such as maternal diabetes, obesity, and fetal macrosomia. A number of studies have examined the potential benefit of elective cesarean section for the prevention of brachial plexus injury in large fetuses [14,15].

It should be noted that an increased frequency of complications after cesarean section was observed in newborns with high and low birth weight. Newborns delivered by cesarean section are also at risk of being injured by the sharp surgical instruments used during the operation, which has been confirmed in published studies. Fetal injury by surgical instruments occurs in 0.1-3.1% of all cesarean sections [16,17]. Attention is also drawn to the psychological problems that arise in the mother and child after cesarean delivery. In mothers, these include reduced emotional responsiveness, anxiety, long-term postpartum depression, difficulty establishing a bond with the child, and lack of «skin-to-skin» contact in the first minutes after birth [17]. In the child born by cesarean section, adaptation mechanisms to the environment are impaired, and they are less stress-resistant compared to those born vaginally.

Over the past 30 years, a decrease in both stillbirth and early neonatal mortality has indeed been noted. However, a deeper analysis shows that the reduction in stillbirth is mainly due to a decrease in antenatal rather than intrapartum fetal death, which primarily depends on the method of delivery [3,4].

Conclusions

1. A review of scientific literature indicates that the increase in the rate of cesarean sections significantly affects the occurrence of postoperative complications in both the mother and the newborn.

2. Although the incidence of complications such as asphyxia, meconium aspiration, and hypoxic-ischemic encephalopathy decreases, a significant number of newborns delivered by cesarean section develop respiratory failure and require additional measures such as mechanical ventilation, oxygenation, and surfactant therapy.

3. Thus, today, in order to reduce perinatal mortality, the efforts of obstetricians-gynecologists and neonatologists should be directed toward antenatal fetal protection rather than increasing the rate of cesarean section.



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