

Optimization of Prevention of Purulent-Septic Complications After Cesarean Section

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Abstract Cesarean section remains one of the most commonly performed procedures in obstetrics and is simultaneously a significant risk factor for postoperative infectious complications. It is well established that the incidence of infections in women after cesarean delivery is 5–20 times higher compared to vaginal birth, highlighting the clinical importance of effective preventive strategies. Routine antibiotic prophylaxis reduces the rate of postoperative infections by approximately 60–70%; however, there remains a need for additional approaches aimed at enhancing tissue repair and reducing inflammatory responses. In recent years, particular attention has been paid to autoplasm therapy, which, due to its high concentration of growth factors, promotes tissue regeneration, improves microcirculation, and reduces the risk of infectious complications. The aim of the study was to optimize a comprehensive strategy for the prevention of purulent-septic complications following cesarean section through the combined use of antibiotic prophylaxis and autoplasm therapy.

Keywords Cesarean section, Purulent-septic complications, Prevention, Autoplasm therapy, Antibiotic prophylaxis, Postpartum period, Endometritis, Uterine subinvolution

1. Introduction

Cesarean section (CS) is one of the most frequently performed surgical interventions in modern obstetrics, with a steadily increasing global rate. Despite advances in surgical techniques, anesthesia, and perioperative care, cesarean delivery remains associated with a higher risk of postoperative complications compared to vaginal birth, particularly infectious morbidity. Purulent-septic complications, including endometritis, wound infection, and pelvic inflammatory processes, continue to be among the leading causes of maternal morbidity in the postoperative period [2,8,11].

It has been reported that the incidence of infectious complications following cesarean section is significantly higher-by 5 to 20 times-than after spontaneous vaginal delivery. This underscores the importance of effective preventive strategies, especially in patients with identified risk factors such as prolonged labor, premature rupture of membranes, anemia, or existing genital tract infections [3,4,7].

Antibiotic prophylaxis is widely recognized as a standard of care and has been shown to substantially reduce the incidence of postoperative infections. However, despite its proven effectiveness, antibiotic prophylaxis alone does not completely eliminate the risk of complications, particularly in high-risk groups. This necessitates the development and implementation of additional therapeutic approaches aimed at improving tissue healing, enhancing local immune responses, and minimizing inflammatory processes [11,14].

In this context, increasing attention has been given to regenerative methods, including autoplasm therapy, also known as platelet-rich plasma (PRP). Due to its high concentration of biologically active substances and growth factors, PRP has demonstrated the potential to stimulate tissue regeneration, improve microcirculation, and accelerate wound healing. Its application in obstetrics, particularly in surgical delivery, represents a promising direction for reducing postoperative complications [4,12].

Therefore, the optimization of comprehensive preventive strategies combining antibiotic prophylaxis with regenerative approaches such as autoplasm therapy is of considerable clinical relevance and may significantly improve postoperative outcomes in women undergoing cesarean section.

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2. Materials and Methods

Clinical investigations were carried out in 110 pregnant women delivered by cesarean section in the lower uterine segment at the Republican Specialized Scientific and Practical Medical Center for Maternal and Child Health (Andijan branch) between 2024 and 2025.

At the first stage, a retrospective analysis of clinical data from 2023 was performed, including the review of medical records of 130 women who had undergone cesarean section, in order to assess the frequency and structure of postoperative complications.

At the second stage, patients were allocated into two groups:

- Group I – 45 patients receiving standard therapeutic management;
- Group II – 65 high-risk patients treated with the proposed comprehensive approach (local antibiotic therapy combined with autoplasm therapy).

All patients underwent ultrasound examination, Doppler assessment of uterine blood flow, and standard clinical and laboratory tests (complete blood count, urinalysis, smear microscopy, and coagulation profile). In the main group, additional parameters were evaluated, including D-dimer levels, C-reactive protein, and blood lactate.

The third stage involved a comparative analysis of the effectiveness of standard and proposed treatment methods. At the fourth stage, an algorithm for the prevention of postoperative complications was developed based on the obtained results. During the postoperative period, patients were assessed for general condition, body temperature, lactation, uterine status, characteristics of lochia, and the condition of the postoperative wound.

3. Results

A retrospective analysis was conducted on the medical records of 130 women who underwent cesarean section. Patients belonging to the high-risk group were included in the study. According to the results obtained, the mean age of the patients was 25 ± 4.5 years, and the following findings were revealed.

Table 1. General Characteristics of Patients

Parameter	Value (%)
Mean age	25 ± 4.5
Primigravida women	35%
Multiparous women	65%
First cesarean section among multiparous	25.5%

Table 2. Vaginal Cleanliness and Infection Indicators

Indicator	Percentage (%)
Vaginal cleanliness I–II degree	24.9%
Vaginal cleanliness III–IV degree	75.1%
Urogenital infection	12.1%
Wassermann reaction (+)	0.6%

Table 3. Microbiological Findings

Microorganism	Percentage (%)
<i>Candida</i> spp.	39.2%
<i>Trichomonas vaginalis</i>	6.5%
Conditionally pathogenic microflora	67.5%
<i>Escherichia coli</i>	23.4%
Staphylococci	19.5%
Streptococci	7.1%
Yeast-like fungi and micrococci	16.5%

In the prospective study, spinal anesthesia was used in all patients, employing amide-type local anesthetics in combination with opioid analgesics. Abdominal delivery was performed via a suprapubic transverse laparotomy according to the Joel-Cohen technique, followed by intraperitoneal cesarean section with a transverse incision in the lower uterine segment.

In patients of the main group, after fetal extraction and placental delivery, modern atraumatic surgical clips were applied to the uterine wound angles to achieve temporary hemostasis and stabilize the uterus. Subsequently, the uterine cavity was gently cleaned using a sterile swab soaked in an antiseptic solution (Decasan) to remove any residual placental tissue and fetal membranes.

Following a preliminary antibiotic sensitivity test, local infiltration of the round uterine ligaments and the vesicouterine fold was performed using a cephalosporin antibiotic (cefotaxime) at a dose of 2.0 g. Uterine wall reconstruction was then carried out by closing the myometrium with a single-layer continuous Schmieden suture using absorbable polyglycolide No. 1, followed by peritonization using the vesicouterine fold.

In the medical history, 60% of women in the main group had previously undergone uterine curettage after cesarean section. Subinvolution of the uterus associated with endometritis was observed in 22% of patients, while elevated body temperature was recorded in 78% of cases.

With the use of intraoperative antibiotic administration combined with subsequent autoplasm therapy, the following outcomes were observed: subfebrile temperature on postoperative days 4–5 occurred in only 3 out of 65 patients and was associated with lactostasis. No cases of uterine subinvolution were detected. Additionally, no hematomas or purulent-inflammatory complications in the area of the postoperative wound were observed.

4. Discussion

The findings of the present study indicate a high clinical efficacy of the proposed approach for the prevention of purulent-septic complications following cesarean section. The high prevalence of infectious risk factors identified during the retrospective analysis highlights the need for enhanced preventive strategies in this patient population.

Local administration of antibiotics ensures a high concentration of the drug directly at the surgical site, thereby

significantly improving the effectiveness of infection prevention [7,9,15]. At the same time, autoplasm therapy appears to promote tissue regeneration, enhance microcirculation, and reduce inflammatory responses.

The absence of uterine subinvolution, hematomas, and purulent-inflammatory complications in the main group demonstrates the clear clinical advantage of the proposed method. The few cases of subfebrile temperature were not associated with infectious processes, further supporting the safety of this approach.

In conclusion, the developed comprehensive strategy can be considered an effective method for preventing postoperative infectious complications and may be recommended for implementation in clinical practice, particularly in high-risk patients.

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