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Research Article

# Prevalence and Risk Factor of Postoperative Adhesions Following Repeated Cesarean Section

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**ABSTRACT**

**Background:** Intrauterine adhesion (IUA) typically occurs as a result of intrauterine trauma associated with a surgical procedure. This study aimed to assess the prevalence and risk factors of postoperative adhesions following repeated cesarean sections.

**Methods:** In this registry-based study, data collection tools included a standardized registry checklist and the American Fertility Society (AFS) classification system for assessing IUA. The diagnosis of IUA was confirmed by an obstetrician-gynecologist, and the AFS scoring was performed by trained researchers responsible for completing the registry data. This study specifically focused on patients who were admitted to the Intensive Care Unit (ICU) of Ayatollah Taleghani Hospital in Ilam following their second cesarean delivery (CD). Within a defined timeframe, the incidence of IUA among these ICU-admitted patients was evaluated. The collected data were subsequently analyzed using SPSS statistical software.

**Results:** According to the findings, out of 121 hospitalized patients, 35 (28.92%) patients were diagnosed with IUA. Out of 35 patients, 15 (42.9%) patients were in Stage I (mild), 13 (37.1%) patients were in Stage II (moderate), and 7 (20%) patients were in Stage III (severe). also, there was no difference between any of the variables in Table 1 and the stage of adhesions (P>0.05).

**Conclusion:** Given that the rate of IUA has been significant, it is recommended that necessary preventive and therapeutic interventions be implemented to reduce its incidence, contributing factors, and related complications.

## Introduction

Pregnancy and childbirth are considered a unique process in a person's life. In fact, given that women are prone to a lot of worry and anxiety during this period, pregnancy is called a special situation. The process of childbirth and childbirth causes many changes, including changes in feelings and emotions, physical, psychological and social changes, which if not managed properly can be considered a painful and stressful experience. In fact, the goal of the health and treatment team is to reduce the unpleasant experience of childbirth, including psychological and physical experiences [1-6].

Despite the global approach to physiological childbirth, today cesarean delivery (CD) is one of the most common surgical procedures in women, the prevalence of which varies in different populations and hospitals [7]. Psychological experiences resulting from pregnancy and subsequent childbirth or CD include anxiety, stress, fear of childbirth and pain. Fear of childbirth is a common problem, ranging in severity from worry to phobia, and

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most women experience some degree of severe or very severe fear during their first pregnancy [8-10].

Anemia is a physiological adaptation process resulting from changes in blood volume, which leads to blood thinning. Anemia can also lead to chronic inflammation, acute infections, and nutrient deficiencies such as vitamin B12 and iron. Pregnant women and children are among the vulnerable groups to anemia, and according to statistics from 2019, 37% of pregnant women in the world are anemic [11-13]. Another complication is nipple fissures, which is a breastfeeding disorder that occurs most often within 3-7 days after delivery and causes failure to breastfeed successfully. Nipple fissures are a type of sore on the nipples of breastfeeding women that are accompanied by pain, flabbiness, and discharge [14-15]. Another complication is gestational hypertension. Increased BP is a major cause of maternal and fetal mortality and complications that occur in a significant number of pregnancies [16]. Another complication of CD that occurs due to trauma to the endometrium is Intrauterine adhesions (IUA). Dilatation and curettage (D&C) are also one of the most common causes of IUA, and the treatment of IUA is a major challenge [17].

IUA is a condition in which scar tissue forms within the uterine cavity. Asherman syndrome is a type of intrauterine adhesion that is associated with amenorrhea, metrorrhagia, infertility, or recurrent miscarriage and placenta accreta. IUA typically occurs as a result of intrauterine trauma associated with a surgical procedure [18].

The indication for IUA treatment is when the patient is symptomatic or intends to become pregnant. The treatment involves breaking up the adhesions and restoring the size and shape of the uterine cavity and endometrial function, and achieving fertility. The exact prevalence of IUA is not available for various reasons, such as the absence of symptoms, the presence of vague symptoms, neglect to recognize symptoms, and also due to predisposing and ambiguous factors of the disease [19-21].

## Methods

This study (2024-2025 years) with Inclusion criteria: 1- Previous history of a CD with Pfannenstiel incision, 2- Spinal anesthesia, 3- Informed consent, 4- Cephalic position, 5- Age group 18-38 years, 6- ICU admission, 7- Absence of uterine abnormalities. Exclusion criteria included 1- Discharge, referral or death of the patient, 2- Other systemic and chronic diseases such as cancer, diabetes, hemophilia, etc., 3- Tobacco use (cigarettes, hookah, etc.), 4- Wound infection, and 5- History of endometriosis. The tools used included the registry checklist and The American Fertility Society (AFS) tool to measure IUA. According to the AFS tool, IUA was divided into three categories: Stage I (mild) with a score of 1–4, Stage II (moderate) with a score of 5–8, and Stage III (severe) with a score of 9–12 (22). The diagnosis of IUA was made according to the opinion of the obstetrician and gynecologist, and the completion of the AFS tool was done by trained researchers who completed the registry data.

In this study, data related to patients who were candidates for CD surgery for the second time admitted to the ICU were extracted. So that within a certain time frame, the level of IUA of patients who were admitted to the ICU was examined. In fact, patients admitted to the ICU were examined for the presence of IUA, and if IUA was definitely diagnosed and had the inclusion criteria for the study, the relevant data were entered into SPSS 16 software and analyzed with descriptive tests such as mean, standard deviation, frequency, independent t-test, and ANOVA.

## Results

According to the findings, out of 121 hospitalized patients, 35 (28.92%) patients were diagnosed with IUA. Out of 35 patients, 15 (42.9%) patients were in Stage I (mild), 13 (37.1%) patients were in Stage II (moderate), and 7 (20%) patients were in Stage III (severe) (Table 1). According to the findings, there was no difference between any of the variables in Table 1 and the stage of adhesions ($P>0.05$).

## Discussion

Women's health is one of the important and priority issues in healthcare [23]. According to the findings, 35 (28.92%) of the patients were diagnosed with IUA. Various studies have investigated the incidence of IUA after miscarriage. In the study of Congendez et al. (2011), the Prevalence of IUA using the AFS tool in 151 people was 14 (9.3%) reports [24], in the study of Wang et al. (2011), the Prevalence of IUA using the NR tool in 84 people was 32 (38.1%) reports [25], in the study of Kuzel et al. (2011), the Prevalence of IUA using the ESH tool in 100 people was 7 (7%) reports [26], in the study of Yasar et al. (2004), the Prevalence of IUA using the NR tool in 58 people was 13 (22.4%) reports [27] and in the study of Salzani et al. (2007), the Prevalence of IUA using the ESH tool in 109 patients was reported to be 41 (37.6%) [28].

In the cohort study by Nuamah et al. (N=335 patients), the Prevalence of 128 (38%) of women had adhesions. Women diagnosed with adhesions were more likely to be older, multiparous, and had previous CS [29]. In low- and middle-income countries, the prevalence of adhesions was reported to be higher. In fact, in order to reduce adhesions, factors such as proper training of medical personnel, the presence of appropriate medical and

treatment facilities, and surgical experience should be prioritized and given due attention [30-33].

According to the findings, out of 121 hospitalized patients, 35 patients were diagnosed with IUA and 15 (42.9%) of the patients were in Stage I (mild), 13 (37.1%) were in Stage II (moderate), and 7 (20%) of the patients were in Stage III (severe). In the study by Yaghmaei et al. (N=109), 33.02% of patients had IUA, among whom 15.59% had dense and vascular adhesions or frozen pelvis [34]. In the study by Dehghani Firouzabadi et al. (N=94), in patients with first-time CD, 35.1% of patients had no IUA, 44.7% of patients had mild IUA, and 20.2% of them had severe IUA [35].

**Table 1- Comparison of demographic and clinical characteristics of patients according to disease stage of IUA**

| Variable | | Stage I (mild) | Stage II (moderate) | Stage III (severe) | N (%) |
|---|---|---|---|---|---|
| Age (years) | M(SD) | 31.93(2.21) | 32.16(2.65) | 31.75(3.49) | 31.97(2.61) |
| Education level, N (%) | No education | 0(0) | 1(8.3) | 1(12.5) | 2(5.7) |
| | Diploma and Undergraduate | 7(46.7) | 2(16.7) | 1(12.5) | 10(28.6) |
| | University Education | 8(53.3) | 9(75) | 6(75) | 23(65.7) |
| Uterine fibroids, N (%) | Yes | 1(6.7) | 2(16.7) | 1(12.5) | 4(11.4) |
| | No | 14(93.3) | 10(83.3) | 7(87.5) | 31(88.6) |
| Number of previous CS, N (%) | 1 | 3(20) | 4(33.3) | 3(37.5) | 10(28.6) |
| | 2 | 7(46.7) | 8(66.7) | 3(37.5) | 18(51.4) |
| | 3 | 5(33.3) | 0(0) | 2(25) | 7(20) |
| Gestational age at delivery in weeks, N (%) | ≤ 37 | 1(6.7) | 1(8.3) | 1(12.5) | 3(8.6) |
| | 38 – 41 | 11(73.3) | 9(75) | 6(75) | 26(74.3) |
| | ≥ 42 | 3(20) | 2(16.7) | 1(12.5) | 6(17.1) |
| Type of current CS, N (%) | Elective | 5(33.3) | 3(25) | 6(75) | 14(40) |
| | Emergency | 10(66.7) | 9(75) | 2(25) | 21(60) |
| Previous surgery, N (%) | Yes | 4(26.7) | 3(25) | 2(25) | 9(25.7) |
| | No | 11(73.3) | 9(75) | 6(75) | 26(74.3) |

## Conclusion

Given that the prevalence of IUA has been significant, it is highly recommended that necessary preventive and therapeutic interventions, including focusing on the adoption of adhesion barriers and improved surgical training, be implemented to reduce its incidence, contributing factors, and related complications, in particular, postoperative adhesions following cesarean section.

### Ethics approval

The study was approved by the Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1397.559).

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