

# Risk Factors and Nursing Strategies of Chills in Patients with Scar Uterus during Cesarean Section

Xiao Feng<sup>1,#</sup>, Xin Hu<sup>1,#</sup>, Chunmei Zhang<sup>1,2,\*</sup>

<sup>1</sup>The Second Affiliated Hospital and Yuying Children's Hospital of Wenzhou Medical University, Wenzhou, Zhejiang, China.

<sup>2</sup>School of Nursing, Wenzhou Medical University, Wenzhou, Zhejiang, China.

<sup>#</sup>Both authors contributed equally to this work.

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**\*Corresponding author:** Chunmei Zhang, The Second Affiliated Hospital and Yuying Children's Hospital of Wenzhou Medical University, Wenzhou, Zhejiang, China; School of Nursing, Wenzhou Medical University, Wenzhou, Zhejiang, China.  
**Email:** sallyzcm@126.com

## Abstract

**Objective:** To explore the risk factors of chills in patients with scar uterus during cesarean section, and formulate nursing strategies. **Methods:** A total of 85 patients with scar uterus who underwent cesarean section in The Second Affiliated Hospital of Wenzhou Medical University from February 2023 to April 2023 were selected as the study subjects. The incidence of chills during cesarean section was recorded. According to whether chills occurred, the patients were divided into chills group and non-chills group. The baseline characteristics were compared between chills group and non-chills group, to analyze the risk factors that affect the chills of patients with scar uterus during cesarean section. **Results:** A total of 36 (42.4%) patients with scar uterus occurred chills during cesarean section. There were statistically significant differences between the two groups in the preoperative pain score ( $t=57.234$ ,  $P=0.002$ ), state anxiety score (S-AI) ( $t=1.230$ ,  $P=0.000$ ), trait anxiety score (T-AI) ( $t=0.039$ ,  $P=0.000$ ), operating room temperature ( $t=3.601$ ,  $P=0.000$ ), insulation measures ( $\chi^2=7.522$ ,  $P=0.006$ ), and emergency admission ( $\chi^2=4.410$ ,  $P=0.036$ ). In addition, multivariate Logistic regression analysis showed that S-AI was an independent risk factor for the occurrence of chills in patients with scar uterus during cesarean section. **Conclusion:** Preoperative pain score, S-AI, T-AI, operating room temperature, insulation measures and emergency admission are closely related to the occurrence of chills in patients with scar uterus during cesarean section. Hence, the related factors should given more attention in clinical practice to reduce the incidence of chills in specific clinical practice.

## Keywords

Cesarean section, scarred uterus, chills, factors

## 1. Introduction

Cesarean section is one of the common obstetric procedures. Previous study reported that the rate of cesarean section reached 40% to 60% in most Chinese hospitals, and even 70% or more in individual hospitals [1]. Cesarean section is an effective method to protect the safety of mothers and infants in patients with high-risk deliveries, especially with difficult labour, certain obstetric complications, or certain obstetric comorbidities. However, surgeries are invasive, and inevitably cause harm to patients. As for cesarean section, it has certain potential hazards for mothers and newborns. Scar Uterus was caused by cesarean sections [2].

Chills are a protective stress response to adverse stimuli during operation. It can generate heat through irregular contraction of skeletal muscles to compensate for the heat of body injury, leading to temperature drop, increasing the oxygen consumption of the body and the burden of the respiratory and circulatory systems, and then inducing a series of clinical Syndrome [3-5]. There are gender and age differences in the occurrence of chills. Studies suggested that young people had a higher incidence, compared to the elderly and children. In addition, the incidence of chills in male is higher than that in the female. Indeed, the patients during cesarean section are more common in female [6].

The evidence suggested that the occurrence of chills during cesarean section are associated with various factors, such as bad emotion, extensive of operative time, certain obstetric complications, certain obstetric comorbidities, and anesthesia modalities [3]. Chills during surgery are dangerous due to hypoxemia [7] or hypothermia [8]. Chills cause muscle activity, generates more heat, increases oxygen consumption, and increases the cardiopulmonary burden, resulting in hypoxemia [7]. In addition, chills-induced hypothermia adversely affects the function of platelet, leading to increase bleeding, and thus increase the risk of cesarean section [8]. In severe condition, chills could weaken wound healing, increase blood loss, increasing the risk of wound infection, and even lead to cardiac arrest [9].

In summary, it is essential to identify the risk factors of chills in patients with scar uterus during cesarean section, and implementation of nursing strategies. The present study aims to investigate the occurrence of chills in patients with scar uterus during cesarean section, and identify the risk factor-induced chills, in order to provide a relevant reference for early prevention and control of chills in patients with scar uterus during cesarean section in the future.

## 2. Information and methodology

### 2.1 General information

This study was approved by the ethics committee of The Second Affiliated Hospital of Wenzhou Medical University. A total of 77 patients with scar uterus were recruited in The Second Affiliated Hospital of Wenzhou Medical University from February to April 2023. The average gestational week and age is  $37.94 \pm 1.19$ , and  $32.01 \pm 4.89$  years old respectively. The inclusion criteria for the present study are as follows: (1) scar uterus; (2) Complete clinical data; (3) Obtaining informed consent from all patients with scar uterus. The exclusion criteria for the present study are as follows: (1) refusal to cooperate; (2) emergency surgery life-threatening patients with scar uterus who needed major resuscitation.

### 2.2 Observation indicators

A total of 77 patients with scar uterus during cesarean section were categorized into chills group and non-chills group according to the occurrence of chills during cesarean section. Differences in baseline characteristics, such as age, body mass index (BMI), gestational week, operating room temperature, et al, were compared between the two groups.

### 2.3 Statistical methods

SPSS 22.0 were used for statistically analyzing. Continuous data were represented as mean  $\pm$  standard deviation, and student's t test were used to compare the differences between the two groups. Categorical data were represented as n (%), and chi-square test was used for comparison between two groups. Multivariate logistic regression was used to investigate the risk factors of chills in patients with scar uterus during cesarean section.  $p < 0.05$  was considered statistically significant.

## 3. Results

### 3.1 General information

A total of 36 (42.4%) patients with scar uterus occurred chills during cesarean section. Additionally, there were significant differences in preoperative pain scores ( $t=57.234$ ,  $P=0.002$ ), state anxiety scores (S-AI) ( $t=1.230$ ,  $P=0.000$ ), trait anxiety scores (T-AI) ( $t=0.039$ ,  $P=0.000$ ), operating room temperature ( $t=3.601$ ,  $P=0.000$ ), insulation ( $\chi^2=7.522$ ,  $P=0.006$ ), and emergency admission ( $\chi^2=4.410$ ,  $P=0.036$ ) between the chills group and non-chills group, suggesting that the above factors are influential factors of chills in the patients with scar uterus during cesarean section (Table 1).

**Table 1. Comparison of general information between the two groups**

Variables	Chills group (n=36)	Non-Chills group (n=49)	$t/\chi^2$	P
Age	32.03±5.02	32.00±4.85	0.167	0.98
BMI	27.81±3.85	28.31±3.83	0.198	0.56
Gestational week	37.94±1.39	37.94±1.04	0.752	0.996
Preoperative pain score	1.14±1.88	0.18±0.75	57.234	0.002
S-AI	48.58±8.41	40.33±8.75	1.23	0.000
T-AI	43.47±10.75	36.59±9.62	0.039	0.000
Operating room temperature	22.87±0.93	23.56±0.70	3.601	0.000
Insulation measures (Yes vs. No)	1 (2.78%)	12 (24.49%)	7.522	0.006
Emergency admissions (Yes vs. No)	10 (27.78)	5 (10.20%)	4.410	0.036

### 3.2 Multifactorial Logistic Regression

Multifactorial logistic regression analysis showed that S-AI was an independent risk factor of chills in the patients with scar uterus during cesarean section [OR (95% CI):1.101 (1.005-1.206)] (Table 2).

**Table 2. Multivariate Logistic Regression of the Occurrence of Chills**

Variables	OR	95% confidence interval of OR		P-value
		lower	upper	
Preoperative pain score	1.625	0.774	3.413	0.2
S-AI	1.101	1.005	1.206	0.038
T-AI	1.000	0.929	1.076	0.995
Operating room temperature	0.471	0.218	1.014	0.054
Insulation measures	0.158	0.012	2.136	0.165
Emergency admissions	0.708	0.053	9.539	0.795

## 4. Discussion

Chill is a common complication during Caesarean section. Because of the heavy burden of the maternal circulatory system, and many Caesarean section parturients are accompanied by fetal distress, if shiver occurs during the operation, it will further increase the burden of maternal circulatory system, causing adverse effects on the fetus and the parturient [3].

In this study, all the influencing factors that may lead to shivering during Caesarean section of scar uterus were included, and preliminary single factor and further multi factor analysis were carried out. The results showed that maternal state anxiety (S-AI) was the influencing factor. Reason analysis: The patient's psychological state, especially the level of anxiety, can affect the risk of trembling. A higher level of anxiety may increase the risk of trembling. This may be due to the physiological effects of anxiety, such as increased heart rate and blood pressure, which can affect body temperature. Therefore, it may be a potential intervention measure for the operation team to provide psychological support for the parturients with scar uterus undergoing Caesarean section. The specific methods include: (1) preoperative consultation to educate patients about the surgical process, successful cases, and expected outcomes, which may help alleviate their anxiety. (2) Teach patients Relaxation technique, such as deep breathing exercises and imagination guidance, to help them control anxiety during surgery. (3) Use distracting techniques, such as listening to music or watching videos, to divert patients' attention and reduce their anxiety. The operating room team members greet and care for patients. During the surgery, the use of humanistic psychological care not only alleviates the anxiety and tension of patients during the surgery process, but also increases their confidence in treatment. It can also establish a good nurse patient relationship and promote patients' active cooperation

with the surgery. Psychological nursing should be used before Caesarean section for women with scar uterus [10].

## 5. Conclusion

To sum up, understanding the occurrence and risk factors of shivering in patients with scar uterus during Caesarean section is essential to improve patient comfort, improve the quality of surgical care and promote faster recovery. It enables healthcare professionals to effectively predict and manage tremors. This study also has limitations: firstly, the sample size of this study is still small, and future research should focus on conducting large-scale quantitative studies to determine specific risk factors related to shivering in this specific patient population. Secondly, the effectiveness of potential interventions needs to be tested in further research. In addition, it may also be necessary to further explore other potential risk factors and intervention measures to provide a comprehensive method to control the tremble of patients with scar uterus during Caesarean section, optimize the surgical results, promote the smooth recovery of patients with scar uterus undergoing Caesarean section, and improve patient satisfaction.

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