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Effects of an Informational Video About Anesthesia on Pre- and Post- Elective Cesarean Section Anxiety and Recovery: A Randomized Controlled Trial

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Data Interpretation D
Manuscript Preparation E
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Background: Showing an informational anesthesia video can reduce the preoperative anxiety of parturients undergoing elective cesarean section (CS). However, the best method for presenting such videos remains unclear, and whether such videos can reduce the anxiety level of women during the entire perioperative period for CS (including preoperative and postoperative) has not been studied yet.


Material/Methods: This study was a single-center prospective randomized trial. We randomly divided 121 pregnant women who were scheduled to undergo elective cesarean section (CS) into 2 groups: one group was shown an informational video (video group) and another group was not (control group). Spielberger's state-trait anxiety inventory was used to evaluate the perioperative anxiety level of parturient women at 3 time points: 1 day before CS, after video education, and 2 days after CS. Salivary cortisol level was evaluated to assess the patients' anxiety level at these 3 time points. Finally, the maternal satisfaction scale for CS and an obstetric quality-of-recovery score (OBsQoR-11) were used to evaluate the satisfaction and recovery of the parturient women 2 days after CS.

Results: Watching a video about anesthesia significantly reduced the anxiety level of the parturient women during the perioperative period (1 day before CS: $p=1.00$, $p=0.96$; after video education: $p<0.01$, $p=0.004$; 2 days after CS: $p=0.01$, $p=0.01$). The postoperative satisfaction scores were significantly improved in the video group ($p=0.007$). OBsQoR-11 scores in the video group and control group were not significantly different ($p=0.48$). Maternal anxiety level was moderately positively correlated with cortisol hormone level.

Conclusions: Showing an informational video about anesthesia (video+education) can significantly reduce perioperative anxiety and improve satisfaction after CS. Although it did not improve the postoperative recovery, it was still significant for anesthesia.

MeSH Keywords: Anesthesia • Anxiety • Cesarean Section • Patient Education as Topic • Recovery of Function • Saliva

Full-text PDF: <https://www.medscimonit.com/abstract/index/idArt/920428>

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Background

The average cesarean section (CS) rate was 36.7% in China in 2018. Among these cases, 21–25% of women developed anxiety during the perioperative period [1]. Preoperative anxiety can also cause autonomic nervous responses and, in turn, fetal distress due to uterine artery vasoconstriction [2–5]. Maternal anxiety and the negative effects of premature birth and low birth weight are positively correlated [3]. Perioperative anxiety can increase postoperative mortality in patients undergoing cardiac surgery [6], and anxiety adversely affects patient rehabilitation [7–13]. Therefore, researchers have paid considerable attention to decreasing the perioperative anxiety level of women undergoing CS. Providing anesthesia information and preoperative education intervention has been shown to reduce preoperative anxiety [14,15]. For example, Shun-Yuan Lin showed that preoperative educational videos about anesthesia can reduce perioperative anxiety and improve patient satisfaction [16]. Jjala et al. showed that providing multimedia information on brachial plexus block or spinal anesthesia before surgery can reduce the anxiety of surgical patients under regional anesthesia [17], but several other studies do not support this [18]. The use of different research methods, video content, and research population may have caused this contradiction and produced conflicting results. Preoperative anxiety exerts several negative effects on parturient women. Whether a preoperative anxiety assessment can be incorporated in a battery of tests performed in a preoperative clinic that is similar to airway assessment remains unclear. The present study used anesthesia video interventions to reduce the anxiety level of patients. We referred patients with high anxiety to a psychologist for psychological therapy. However, the anxiety level of women undergoing CS has been the focus of most preoperative studies. Whether informational videos about anesthesia can reduce the anxiety level of women undergoing CS postoperative and lessen the effects of anxiety on postoperative recovery has been unclear. Cortisol level is frequently used as an objective indicator of anxiety [19] and it is a reliable indicator of adaptive stress in the hypothalamus–pituitary–adrenal axis (HPAA) [20]. Salivary cortisol can reflect activation of the HPAA within 30 min [21,22]. Cortisol extraction from saliva is the most commonly used sampling method, and it has the advantage of satisfactory maternal compliance. Therefore, the present study aimed to evaluate the effect of preoperative information videos and brochures about anesthesia on pre- and postoperative anxiety levels and to observe the effect of anxiety on postoperative recovery. Watching informational videos can reduce perioperative anxiety, improve maternal satisfaction with intraspinal anesthesia, and aid in maternal recovery by reducing perioperative anxiety levels.

Material and Methods

Design

A single-center, single-blind, and randomized controlled study was conducted in the Obstetrics Department of the Third Subsidiary Hospital of Shihezi University from January to July 2019 by using parallel group design. Participants were randomly assigned to a video group (instructed to watch informational videos about anesthesia and answer women's questions) and a control group at a ratio of 1: 1. The study was approved by the Ethics Committee of Shihezi University Medical College (2018-104-01). The trial was registered with the China Clinical Trials Registry (ChiCTR1800018321).

Sample

The participants were recruited from the obstetric ward of the Third Affiliated Hospital of Shihezi University. The inclusion criteria were: American Society of Anesthesiologist Classes I–II to undergo elective CS, with clear consciousness, mentally stable, and can answer questions independently and clearly; in junior high school or above; and volunteered to participate in the study. The exclusion criteria were: maternal age <16 years old or >45 years old, unconscious, with mental disorder, unable to independently and clearly answer questions, or refused to participate. Women with critical conditions, such as fetal distress, placental abruption, uterine rupture, severe eclampsia, and severe pregnancy-induced hypertension, were also excluded. Other factors, such as intraoperative massive hemorrhage (i.e., bleeding more than 2000 mL), and anesthesia accidents, such as general spinal anesthesia and pulmonary embolism, were other causes for exclusion. After the purpose of the study was explained to the participants, written informed consent was obtained.

Sample size was calculated in accordance with a previous study ("Effects of anesthesia informational video on the preoperative anxiety and postoperative satisfaction of women undergoing CS") [18]. An average difference of 8 points based on anxiety score exhibits clinical significance in the treatment of anxiety disorder [23], with 80% efficacy at 0.05 significance level. A total of 60 women were included in each group, allowing for a 10% dropout rate.

Randomization

The participants were randomly grouped using a computer. Patients were randomly assigned to the video and control groups (1: 1) by hospital staff members (who were not involved in the research) and the group assignment data were stored in opaque envelopes. The researchers, participants, and anesthesiologists were unaware of the grouping.

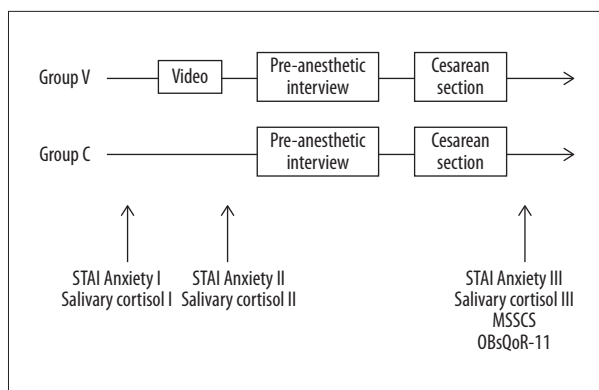


Figure 1. Overview of the study structure and time points of data collection.

Intervention

The major indicators of the video group – Spielberger’s State-Trait anxiety inventory (STAI) score and salivary cortisol level – were assessed at 3 time points: the evening before surgery (19: 00–21: 00), 30 min after the education session (watched the video, read the brochures, and answered the questions related to women’s doubts), and the evening (19: 00–21: 00) after the operation. In the evening 2 days after the operation (19: 00–21: 00), the secondary indicators (i.e., the satisfaction scores of the women who underwent CS and the recovery quality scale scores) were determined. The procedure for the control group was identical to that of the video group, with 1 important difference: the control group did not receive preoperative education, and the STAI score and salivary cortisol level were frequently assessed after 30 min (Figure 1). Participants in both groups received routine nursing services before CS. On the day of CS surgery, the 2 groups of participants consulted with an anesthesiologist who evaluated the anesthesia of parturient women, explained the anesthesia method, risks, and precautions, and answered their questions.

Our team produced an 8.5-min video exclusively for this study. The video shows the actual process of administering elective CS anesthesia, from preoperative visits by anesthesiologists to expectant mothers finally entering the operating room. The video also shows nurses opening intravenous channels, anesthesiologists administering anesthesia, and the process of returning to the ward after undergoing CS. The video presents the responsibilities of an anesthesiologist and the equipment (e.g., anesthesia machine and rescue medicine) used to protect mothers and infants. Other aspects covered in the video included the preoperative and intraoperative rights of mothers and the after-effects of anesthesia. The video did not include the risks of intraspinal anesthesia, information about surgical procedures, or bloody images. The educational manual was based on maternal questions about intraspinal anesthesia

and CS. Five questions about intraspinal anesthesia and their corresponding answers are included in Appendix 1.

Detection index

Salivary cortisol

Collection method: A sterile cotton ball was swabbed inside the mouth for at least 2 min and then placed in a 20-mL sterile syringe. The saliva (2 mL) was transferred to a test tube by pressing the plunger of the syringe. The saliva was centrifuged for 10 min at 3000 rpm, and 1 mL of the sample was stored at -20°C for later analysis. We commissioned Xinjiang Di’An Testing Company to analyze the samples. The chemiluminescence method was used for detection using a Cobas® 8000 modular analyzer (Roche Diagnostics, USA). A cortisol detection kit was also used.

STAI

Spielberger et al. developed the STAI [24]. A subscale that consisted of 40 items was used to evaluate 2 different types of anxiety: STAI-state (STAI-S) and STAI-trait (STAI-T). Items 1 to 20, which concerned STAI-S, were used to assess the experiences or feelings of fear, tension, anxiety, and neuroticism of an individual immediately or recently. Items 21 to 40, which involved STAI-T, were used to evaluate a woman’s stable anxiety and tension personality traits. Each answer was scored 1–4 points. The lowest score was 20, and the highest score was 80. A high score indicates a high anxiety level. This scale is extensively used in research and clinical practice in China [25]. The Cronbach’s alpha coefficients of STAI-S and STAI-T were 0.83–0.92 and 0.86–0.92, respectively. STAI is widely used to measure the trait and state anxiety of pregnant women [24]. The trait anxiety questionnaire was completed at 3 time points: the evening of the day before the operation (19: 00–21: 00), 30 min after the video was shown, and in the evening 2 days after the operation (19: 00–21: 00). The researchers instructed the patients how to answer the anxiety scale questions.

Maternal satisfactions scale for CS (MSSCS)

MSSCS is specially used to evaluate the satisfaction of parturient women who were administered intraspinal anesthesia during selective CS [18]. The questionnaire consisted of 22 items (Appendix 2) for assessing the patients’ satisfaction with anesthetics, procedures, adverse effects, and maternal anesthesia experience. Each item was scored using a 7-point scale, with the lowest and highest scores of 22 and 154, respectively. A high score denotes high satisfaction. MSSCS was completed from 19: 00 to 21: 00 on the day after CS.

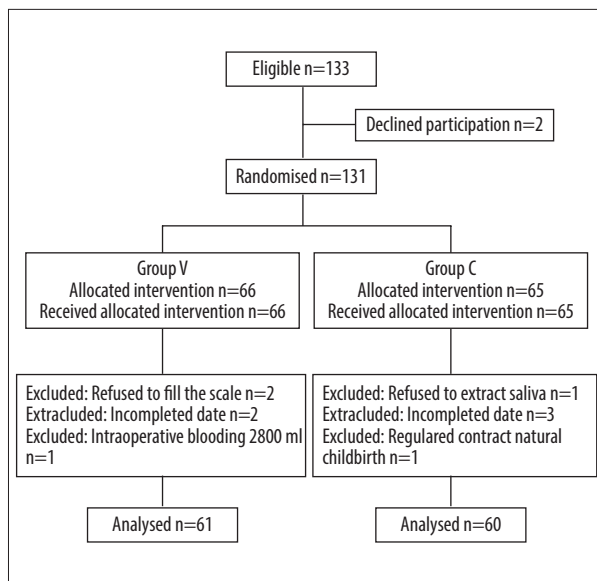


Figure 2. Participant flow diagram.

Obstetric quality-of-recovery score (ObsQoR-11)

ObsQoR-11 [26] is an 11-item questionnaire (Appendix 3) that is used to evaluate the recovery of parturient women after elective CS. ObsQoR-11 is evaluated in terms of the degree of postoperative pain, nausea, vomiting, activity, baby care, hygiene, and emotional control. Each item was scored using an 11-point system, with minimum and maximum scores of 0 and 110, respectively. A high score reflects good recovery. The questionnaire was completed from 19: 00 to 21: 00 on the day after CS.

In addition to the aforementioned indicators, we collected general data, including demography, first CS, and educational level. After CS, we collected information on neonates sent to the pediatric intensive care unit. Data on fever and exhaustion at 12 h were also collected. Combined spinal–epidural anesthesia was the first choice for CS, and an intravenous analgesia pump was used to administer analgesic after CS.

Table 1. Demographic and clinical characteristics.

Variable	Video n=61	Control n=60	P value
Age (years)	27.8±4.3	30.6±4.7	0.32
BMI Kg/m ²	29.9±3.9	30.3±3.6	0.57
Gestation at CS (weeks) (median, interquartile range)	39.1 (38.6–39.4)	39.1 (38.6–40.0)	0.58
Nulliparous	37 (61)	34 (57)	0.19
Pregnancy complications*	25 (41)	18 (30)	0.12
Education above high school	47 (77)	43 (72)	0.37
Previous neuraxial block or lumbar puncture	28 (46)	29 (48)	0.57

Date are mean±standard deviation or number (percentage), except where labelled. BMI– body mass index; CS – cesarean section.

* Gestational diabetes mellitus and gestational hypertension.

Statistical analysis

SPSS 23.0 was used for statistical analysis. The participants’ general clinical preoperative and postoperative data and continuous variables (e.g., age and BMI) were analyzed using an independent-samples *t* test, and the mean and standard deviation were determined. Classified variables (e.g., proportion of primipara and fever rate after surgery) were analyzed using the χ^2 test and Fisher exact test. Data on STAI score, postoperative satisfaction score, postoperative recovery score, and salivary cortisol level in the 2 groups were analyzed using a nonparametric test because the variables did not satisfy the criteria for normality. Linear correlation analysis was performed to analyze the relationship between STAI score and quality recovery score before and after surgery.

Results

Among the 131 eligible women, 5 did not complete the questionnaires, 3 refused to participate (2 refused to fill out the questionnaire after CS and 1 refused to have her saliva collected), 1 gave birth naturally because of early regular uterine contractions, and 1 was excluded because of intraoperative bleeding of 2800 mL. A total of 121 participants were included in the analysis, with 61 in the video group and 60 in the control group (Figure 2). No significant differences were found in demographic or clinical characteristics between the 2 groups (Table 1).

As shown in Table 2, no significant differences were observed in the STAI scores of the video and control groups 1 day before CS. After watching the video, the preoperative STAI scores of the video group were significantly lower than those of the control group ($p<0.01$, $p=0.004$). Two days after CS, the anxiety levels of the video and control groups were significantly lower than during the preoperative day. The STAI scores of the control group were significantly higher than in the video

Table 2. Outcome measures for video and control groups.

Variable	State-Trait Anxiety	Video n=61	Control n=60	P value
One day before CS	State*	36.8±10.4	36.8±9.4	1.00
	Trait*	35.1±10.5	35.0±9.8	0.96
After video education	State	30.6±8.0	36.5±9.5	<0.01
	Trait	30.3±7.7	35.1±9.9	0.004
Two days after CS	State	27.5±8.5	30.5±10.4	0.09
	Trait	27.8±7.9	30.6±10.2	0.09

Date are mean±standard deviation. * Score 20–80.

Table 3. Outcome measures for salivary cortisol.

Variable	Video n=61	Control n=60	P value
One day before CS	9.14±4.42	8.65±2.64	0.47
After video education	7.26±1.33	8.06±0.77	0.02
Two days after CS	10.66±8.36	9.78±6.46	0.52

Date are mean±standard deviation.

Table 4. Outcome measures for MSSCS and ObsQoR-11.

Variable	Video n=61	Control n=60	P value
MSSCS	132.1±13.7	124.3±17.7	0.007
ObsQoR-11	64.8±17.2	60.9±17.0	0.48

Date are mean±standard deviation.

Table 5. Anesthetic and delivery date.

Variable	Video n=61	Control n=60	P value
Conversion to general anesthesia	1 (2)	0 (0)	0.51
Blood transfusion during CS	0 (0)	0 (0)	1.00
Transfer of neonate to NICU	3 (5)	2 (3)	0.75
Intraoperative hemorrhage	507.9±124.8	525.9±171.2	0.51
Postoperative hemorrhage	212.5±100.8	220.8±89.1	0.41
Get out of bed 12 hours after CS	49 (80)	48 (80)	0.82
Gastrointestinal exhaust 48 hours after CS	53 (87)	52 (87)	0.80
Fever 48 hours after CS	8 (13)	9 (15)	0.65
Severe pain rate*	32 (52)	33 (55)	0.68

Date are mean±standard deviation or number (percentage), except where labelled. NICU – Neonatal Intensive Care Unit. * Visual analogue score 7 to 10.

group ($p=0.01$, $p=0.01$). No differences in salivary cortisol levels were found between the video and control groups on the day before CS. The salivary cortisol level of the video group was significantly lower than that of the control group 30 min after watching the video ($p=0.02$). Two days after CS, the salivary

cortisol level of the 2 groups decreased compared with that during the day before CS; however, the difference between the video and control groups was insignificant ($p=0.52$, Table 3). We found that maternal anxiety level was moderately positively correlated with cortisol hormone level.

Table 6. The correlations between anxiety score and ObsQoR-11.

Measure	n	Score	Anxiety scale	r	P value	
ObsQoR-11	121	64.8±17.2	Preoperative CS	State	-0.226	0.145
				Trait	-0.149	0.340
			Postoperative CS	State	-0.335	0.028
				Trait	-0.420	0.005

Scores are mean±standard deviation.

Table 7. Prevalence of anxious state.

	One day before CS		After video education		Two days after CS	
	Video n=61	Control n=60	Video n=61	Control n=60	Video n=61	Control n=60
Low anxiety (STAI ≤37)	31 (51)	31 (52)	48 (79)	33 (55)	55 (90)	47 (78)
Moderate anxiety (STAI 38–44)	19 (31)	13 (22)	7 (11)	12 (20)	3 (5)	8 (13)
High anxiety (STAI ≥45)	11 (18)	16 (26)	6 (10)	15 (25)	3 (5)	5 (8)

Data are number (percentage).

Compared with the control group, the video group showed higher postoperative satisfaction score ($p=0.007$, Table 4). The video group had a higher ObsQoR-11 score than the control group, but the difference was not significant ($p=0.48$, Table 4). The follow-up data 2 days after CS are provided in Table 5. The amount of bleeding, rate of leaving bed 12 h after CS, degree of exhaustion 48 h after CS, intensity of fever 48 h after CS, and severity of pain after CS between the 2 groups were not statistically different.

A combined analysis of the 2 groups showed that high postoperative state anxiety resulted in lower postoperative recovery score. These parameters exhibited a negative correlation ($r=-0.335$ $p=0.008$, $r=-0.42$ $p=0.005$; Table 6). Video education can reduce perioperative anxiety level, particularly preoperative anxiety level, and enhance maternal satisfaction after CS. However, video education did not improve recovery after CS. Recovery after CS was negatively correlated with postoperative anxiety.

Discussion

We found that before elective CS, watching anesthesia information videos and reading anesthesia brochures to explain elective CS significantly reduced the perioperative anxiety of pregnant women. In this study, 70% of the participants believed that our intervention (video+education) was necessary. This result is consistent with that of Shun-Yuan Lin et al. [16] but contradicts that of Vaeley [18]. Analysis showed that reducing anxiety by watching anesthesia informational videos before CS

was ineffective, but explaining anesthesia to the participants through manuals and answering related questions raised by the participants were effective. In this study, approximately 50% of the expectant mothers felt calm immediately after the education session. As shown in Table 7, the number of participants with moderate anxiety in the video group decreased from 31% to 11% after the education session. The number of participants with severe anxiety decreased from 18% to 10%. After CS, only 5% of the sample in the video group and 13% in the control group experienced moderate anxiety, proving the effectiveness of our intervention.

In this study, salivary cortisol level was used as an objective physiological marker of anxiety. We found a moderately positive correlation between STAI score (subjective measurement) and salivary cortisol level, and a similar finding was obtained by a previous study [20]. During the third trimester of pregnancy, cortisol reaches its highest level [27]. After elective CS, the cortisol level decreases within a minimum of 48 h [28]. The present study showed that the salivary cortisol level of the parturient women in the 2 groups decreased after CS compared with that on the preoperative day, but the difference was not statistically significant. This finding is attributed to several participants experiencing preoperative complications, such as gestational diabetes mellitus (GDM) and gestational hypertension. By contrast, subjects with gestational hypertension, GDM, and preeclampsia, which can affect cortisol levels, were excluded [28]. Hellhammer et al. [20] showed that menstrual cycles, contraceptives, or medical conditions affect the binding of cortisol and the activation of HPA. At 2 days after CS surgery, the estrogen and prolactin levels in a mother's

body change significantly, along with oxytocin and hemostatic drugs. This condition can affect the release of cortisol in the body. Further studies by Bae et al. [29] found that the salivary cortisol converter is a highly discriminatory stress biomarker that is significantly correlated with state anxiety and heart rate and may be superior to salivary cortisol. However, this finding requires further experimental confirmation.

Satisfaction scores in our 2 groups were higher than those reported by Vaeley et al. The highest satisfaction scale score in our study was 154. In the study of Vaeley et al., the satisfaction scale was completed between 08: 00 and 17: 00, within 24 h after the operation. By contrast, our scale was completed from 18: 00 to 20: 00, within 48 h after the operation. The recovery time of the women after surgery was longer. Therefore, the average satisfaction score should be higher than that of Vaeley et al. The present study showed that an anesthesia informational video and explaining the process of administering anesthesia to the women reduced their anxiety before surgery and enabled them to cooperate better during anesthesia administration and surgery. When adverse reactions such as discomfort and pain are experienced during the operation, the women can also immediately seek the help of the anesthesiologist; therefore, maternal satisfaction is affected and the postoperative satisfaction of the video group was significantly higher than that of the control group. We believe that the proposed method (video+education) is better than providing only oral or written information.

The difference in the quality recovery score between the 2 groups after CS was insignificant. No significant difference was found in various postoperative indicators: amount of bleeding after operation, rate of getting out of bed 12 h after CS, rate of exhaustion 48 h after CS, rate of fever 48 h after CS, and rate of severe pain after CS. Hobson et al. [30] demonstrated that preoperative state anxiety is negatively correlated with postoperative recovery. This study found that postoperative anxiety was negatively correlated with postoperative recovery. The recovery scale developed by Setty et al. [26] was used for the first time in the current study, particularly in elective CS, emphasizing the pain score of mothers after surgery. In the hospital where the study was conducted, all the women used a postoperative analgesia pump to administer postoperative analgesic. Nevertheless, 50% of the women still experienced severe postoperative pain. In this regard, the postoperative analgesic of the puerperia was not ideal. These results reflect the actual situation and operation in the hospital involved. Thus, the results of this study are relevant for specific locations but may be inapplicable to other institutions. Showing an informational video about anesthesia during the preoperative period reduced the perioperative anxiety of parturient women. We found that recovery after CS was negatively correlated with postoperative anxiety. However, the proposed

method did not improve the postoperative recovery of the participants, indicating that several factors affect the improvement of postoperative recovery. Postoperative pain is a cause of postoperative anxiety [31]. Preoperative anxiety aggravates postoperative pain in patients undergoing gastrointestinal, obstetric, and gynecological surgeries [32]. Women who undergo CS usually have negative feelings due to their lack of activity and inability to feed their babies because of postoperative pain, especially on the first day after CS. This observation indicates that postoperative pain is an important factor affecting postoperative recovery. In this study, many pregnant women feared that the use of analgesics would negatively affect their milk and baby's health; thus, they repeatedly refused to use analgesics. These women felt that the effect of postoperative analgesia was poor, and this feeling may account for the lack of differences between the video and control groups in this study. Auricular acupressure therapy [33] can alleviate anxiety and fatigue after CS. Massage can reduce anxiety and wound pain after CS [34]. Bupivacaine-soaked Spongostan, which is an absorbable gelatin powder and hemostatic material, is locally applied in surgical procedures with venous hemorrhage and exudation when traditional homeostasis is difficult, but its application on CS surgical wounds increases the satisfaction rate and decreases postoperative anxiety levels and postpartum depression rates [35]. Although midazolam can reduce the incidence of anxiety, nausea, and vomiting in patients undergoing CS, it has no effect on postoperative recovery [36]. Several antianxiety drugs, such as lorazepam and pregabalin, do not reduce preoperative anxiety and postoperative pain [37,38]. Anesthesiologists must explore methods that can improve patient recovery after CS.

This study has several limitations. We observed (but failed to confirm) that the severe postoperative pain of parturient women critically affects postoperative recovery, and we did not exclude anxiety caused by severe pain after surgery and did not explore its effect on recovery. We plan to perform a follow-up study that will include a control group with an effective postoperative analgesia procedure to compare postoperative recovery in that such group (rest pain and motor pain scores below 4 points) and confirm whether postoperative severe pain is negatively correlated with postoperative recovery. This future study should set up 2 control groups – a video group and a training group (education) – which can better explain the effectiveness of the intervention measures (video+brochure) in this study. However, restrictions on funds and time prevented inclusion of these, and we plan incorporate this important issue in our future studies. A few participants were allowed to eat or drink water before collecting salivary cortisol, resulting in deviations in salivary cortisol detection.

Conclusions

Before elective CS, watching an informational video about anesthesia and reading anesthesia brochures can significantly reduce maternal preoperative anxiety, and can significantly reduce maternal postoperative anxiety and improve satisfaction after CS. Although it failed to improve the postoperative recovery, it was still significant for anesthesia. The preoperative anxiety assessment should be incorporated in a battery of tests performed in the preoperative clinic, as is performed with airway assessment. We found that providing anesthesia information and preoperative education can reduce preoperative anxiety.

Supplementary Data

Appendix 1

Anesthesia Brochures

1. How can anesthesia dull the pain felt by women undergoing CS?

An anesthesiologist opts for intraspinal anesthesia, which involves injecting local anesthetics into different spaces of the spinal canal to produce an anesthetic effect on the corresponding areas innervated by the spinal nerve. Anesthesiologists use anesthetics to paralyze the sensation and transmission of nerve fibers around the area to be operated on, leading to a temporary loss of function of the transmitting pain signals. As such, the patient will not feel pain when a certain area is operated on. The preceding explanation presents the basic principle of anesthesia.

2. Why do you still feel anesthetized?

Many patients believe that they are unaware of anything after anesthesia is administered during the operation, and thus they allow the doctor to operate at will. However, this assumption is inaccurate. At present, CS anesthesia does not completely diminish a patient's sensation. Patients can still perceive touch, pressure, and proprioception but cannot perceive temperature and pain. An expectant mother feels "numb" but not "drunk." A patient anesthetized during surgery remains conscious and is aware of everything happening around her. However, she is completely numb to the pain caused by cutting and pulling during the operation. Anesthesiologists will check the effect of anesthetic before the operation to adjust its dosage and prevent a high level of anesthetic from affecting the safety of mothers and babies. This procedure requires expectant mothers to express their feelings to their doctors when undergoing the operation.

3. What will the anesthesiologist do during the operation?

During the operation, the anesthesiologist will monitor the patient with regard to the different reactions of her body to the operation. The anesthesiologist will perform a corresponding treatment to ensure the patient's safety. If a patient experiences discomfort or has a request, then she can talk to the anesthesiologist, who will address her issues accordingly.

4. Is the administration of intraspinal anesthesia painful?

Intraspinal anesthesia has a long history, and the instruments used to administer it have been improved for generations and are currently extremely mature. In addition, doctors who administer anesthesia are especially trained, with many years of experience. The procedure is not painful, and patients will only feel a slight tingling or soreness during the entire process.

Acknowledgment

We would like to acknowledge the assistance provided by the Obstetrics Department of the Third Subsidiary Hospital of Shihezi University and the Anesthesiology Department of the First Subsidiary Hospital of Shihezi University. We sincerely thank all the women who participated in this study.

Conflict of interest

None.

5. Does anesthesia affect the fetus in the mother's abdomen?

Anesthesia does not affect the fetus. The influences of preoperative and anesthetic medications on the fetus must be considered during CS. Anesthesiologists typically use intraspinal anesthesia (commonly known as hemi-anesthesia) to avoid the influences of intravenous analgesics and sedatives on the fetus. After fetal removal, a decision is made whether to add anesthetics or analgesics, depending on the situation of the mother, to prevent any effect on the fetus.

Appendix 2 [18]

Maternal Satisfaction Scale for Cesarean Section							
Strongly disagree=1, Neither agree nor disagree=4, Strongly agree=7							
	1	2	3	4	5	6	7
I was pain free during my cesarean section							
I felt the anesthetic I received was safe for me							
I felt the anesthetic I received was safe for my baby							
I had no pain when the needle was inserted into my back							
The needle was inserted easily into my back							
I was in a comfortable position when the needle was put into my back							
<i>During the cesarean section:</i>							
I did not experience shivering							
I did not experience dry lips/mouth							
I did not experience a dry throat							
I did not experience a change in mood							
<i>After the cesarean section:</i>							
I did not experience back problems							
I did not experience itchiness							
<i>In the operating room, during the surgery, I was able to:</i>							
Interact with my partner							
Bond with my baby							
Have a sense of control							
Communicate with the staff							
See my baby after delivery							
Hold my baby after delivery							
I knew what the staff were doing during the operation							
I found the atmosphere in the operating room comfortable							
I was able to nurse my baby after delivery							
I recovered quickly after my anesthetic							

Appendix 3 [26]

Quality of recovery score follow Cesarean delivery (ObsQoR-11)											
How have you been feeling in the last 48 h?											
(0–10, where 0=very poor and 10=excellent)											
	Strongly disagree					Strongly agree					
1. I have had moderate pain.	10	9	8	7	6	5	4	3	2	1	0
2. I have had severe pain.	10	9	8	7	6	5	4	3	2	1	0
3. I have had nausea or vomiting.	10	9	8	7	6	5	4	3	2	1	0
4. I have been feeling dizzy.	10	9	8	7	6	5	4	3	2	1	0
5. I have had shivering.	10	9	8	7	6	5	4	3	2	1	0
6. I have been comfortable.	0	1	2	3	4	5	6	7	8	9	10
7. I am able to move about independently.	0	1	2	3	4	5	6	7	8	9	10
8. I can hold my baby without assistance.	0	1	2	3	4	5	6	7	8	9	10
9. I can feed /nurse my baby without assistance.	0	1	2	3	4	5	6	7	8	9	10
10. I can look after my personal hygiene/toilet.	0	1	2	3	4	5	6	7	8	9	10
11. I feel in control.	0	1	2	3	4	5	6	7	8	9	10

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