Original article

Evaluation of the Relationship between Prenatal Anxiety and Intra-cesarean Hemorrhage

Abbas Sadeghian 1, Kokab basiri Moghadam 2*, Raheleh Baradaran 3, Mohammad Hossein Esmaeilzadeh 4

1. MSc Student in Intensive Care Nursing, Faculty of Nursing, Gonabad University of Medical Sciences, Gonabad, Iran.

2. Assisatan professor, faculty of paramed college, Gonabad University of Medical Sciences, Gonabad, Iran.

3. PHD candidate in Anatomy, Department of anatomy and cell biology,School of medicine, Mashhad university of medical sciences, Mashhad, Iran.

4. MSc Student in Emergency Nursing, Department of Emergency Medicine, school of Nursing and Midwifery, Social Determinant of Health Research center, Gonabad University of Medical Sciences, Gonabad, Iran.

*correspondence: **Kokab basiri Moghadam,** Assisatan professor, faculty of paramed college, Gonabad University of Medical Sciences, Gonabad, Iran. Email: k.basiri@gmu.ac.ir

Abstract:

Introduction: Anxiety is one of the most common mental disorders during pregnancy that is more prevalent in the first and third trimesters than in the second trimester. One of the most common methods of delivery in the world, especially Iran, is cesarean section, which is an independent agent of anxiety. Because one of the major complications of cesarean section is bleeding, we sought to investigate the relationship between prenatal anxiety and intra-cesarean bleeding.

Methods: In this descriptive-analytical study, 90 pregnant mothers who were candidates for cesarean section in June 2019 referred to Allameh Bohlol Hospital in Gonabad, who had a 39-week gestational age and were candidate for normal pregnancy and were candidates for cesarean section with spinal anesthesia. They were included in the study using available method. Then the questionnaire containing demographic and anxiety characteristics of Spielberger was given to the subjects and their vital signs, hemoglobin and hematocrit before and after surgery and the amount of bleeding during cesarean section were measured and recorded and the correlation between anxiety and bleeding was assessed by tests. Statistical analysis and linear regression were calculated.

Findings: In the present study, 90 mothers participated in study, mean age of 31.13±4.01 years, majority had diploma and under diploma (53.3%), mean weight of 73.92±10.20 and duration Cesarean section was 56/18±12/61. Based on Spielberger's anxiety test, preoperative anxiety level was 48.20±4.68 and bleeding during cesarean section was 221.33±62.8 cc. The Pearson correlation test showed a significant relationship between the amount of bleeding during cesarean section. ($P < 0.05$).

Conclusion: Anxiety is present in pregnant women who are candidates for cesarean section and have a significant relationship with bleeding during cesarean section. Therefore, preoperative care to reduce anxiety in pregnant women is recommended for cesarean section.

Keywords: Cesarean section, Anxiety, Prenatal anxiety, Bleeding.

[Downloaded from mail.intjmi.com on 2026-11-20]

[DOR: 20.1001.1.23222913.2019.8.3.3.7]

Introduction:

pregnancy is associated with an increased likelihood of mental disorders such as anxiety and depression (1). This is very important since mental health problems during pregnancy have adverse effects on maternal and fetal health (2-5) and anxiety, depression in pregnancy increases the risk of postpartum depression (6, 7). Among these disorders, antenatal anxiety is more common, with the highest prevalence in the third trimester and the lowest prevalence in the second trimester, and studies suggest that it affects the type of delivery and increases its complications (6, 8). -10). Young age, history of alcohol use and low self-esteem are important risk factors for anxiety during pregnancy, while perceived social support and marital satisfaction have been identified as caring factors (6). According to studies, anxiety has been associated with cesarean section and its complications (9). One of the complications of cesarean section is bleeding during surgery. Hematocrit decreases by 10% after cesarean section, and blood transfusion is required in 6% of women undergoing cesarean section (11, 12). Placenta previa, placental rupture, increased number of pregnancies, multiple pregnancy, uterine atony, hypertensive disorders and coagulation disorders are important risk factors for postpartum hemorrhage requiring blood transfusion (13). Cesarean section incisions occur in four stages of repair: homeostasis, inflammation, proliferation, and tissue deformation. In the homeostasis phase of the immune system, by producing proinflammatory cytokines has an important role in healing that anxiety can delay wound healing by reducing these cytokines and prolong the bleeding time (14), although mental disorders during pregnancy are more prevalent than after childbirth but have received less attention (15, 16). Unfortunately, studies on antenatal anxiety are more limited and the prevalence is very different in different studies, with one study showing 7% of pregnant women in the second trimester, in another study 54% Pregnant at least in one pregnancy assessment and in another study almost all women had anxiety in the first or third trimester (2, 6, 10). There is also no specific timeframe for influencing anxiety during and after childbirth complications. Considering the 40% prevalence of cesarean section in Iran (17), this study examined the relationship between pre-natal anxiety and the rate of bleeding during cesarean section. it placed. If the relationship between the two can be corrected during pregnancy, it can reduce the anxiety of pregnant women about postpartum hemorrhage and the percentage of blood transfusions that follow.

Methods:

In a descriptive-analytical study, 90 pregnant mothers who were candidates for cesarean section who referred to Allameh Bohlul Hospital in Gonabad for treatment in June 2019 and were willing to participate in the study, were included in the study after obtaining informed consent. Inclusion criteria were: age between 20 to 39 years, gestational age ≥39 weeks, candidate for cesarean section with spinal anesthesia, absence of contraindication to spinal anesthesia, absence of organic or endocrine system disease, no history of mental illness,

[Downloaded from mail.intjmi.com on 2026-11-20]

[DOR: 20.1001.1.23222913.2019.8.3.3.7]

Ability to fill out a questionnaire without help and willingness to participate in the study.

Exclusion criteria included: history of mental illness, personality disorders, mental retardation, anxiolytic drugs, fetal malformations, patients who were diagnosed with placental abruption, placenta previa, avascular placenta, Ectra placenta, polyhydramnios, oligohydramnios, Uterus atony and adhesion. Diseases that failed more than twice in the spinal anesthesia, and any other complication during surgery, and the patient's dissatisfaction with the study continued.

Then, Spielberger State-Trait Anxiety Questionnaire was given to the subjects and their questionnaire score was recorded. Their vital signs were measured and blood samples were sent for hemoglobin and hematocrit tests. At the end of the operation, blood was weighed with a scales, and the amount of pure blood was measured in milliliters. At the end of the operation, the patient's vital signs were reassessed and hemoglobin and hematocrit were measured. It should be noted that all cesareans were performed by a surgeon and spinal anesthesia, by an anesthesiologist, and for all patients the rate and type of cesarean section (van Stein) and time (after birth) and dosage (50mg) of oxytocin, Aligned. Three questionnaires and checklists were used in the present study. The first questionnaire related to demographic characteristics of patients including age, education, weight, history of previous surgeries that were completed using patient records or questions from patients or family members. Checklist for recording hemodynamic indices including: systolic blood pressure, diastolic blood pressure, pulse rate, hemoglobin, hematocrit and cesarean section duration recorded by Spiel Berger's anxiety questionnaire containing 40 items including the first 20 options used to measure manifest anxiety and the next 20 options to measure latent anxiety. In the first part of this section 20 options were four answers to very low, low, high and very high, and completed by interviewing patients, the minimum score of this questionnaire was 20 and the maximum was 80 with a score of 20-31 with mild anxiety, A score of 32-42 is considered as moderate anxiety, a score of 43-53 is considered to be relatively severe, and a score of 54-64 as a relatively high anxiety, and a score of 65-75 is considered as severe anxiety, and a score of 76 and above is considered as very severe anxiety. The scientific validity and reliability of the Spielberger Anxiety questionnaire in a study evaluated by Mahram in 1994 and its scientific confidence was obtained through Cronbach's alpha formula which was 0.9452 in normal population and 0.9418 in criterion society. The reliability of the test as a ratio of variance of actual scores to variance of observed scores was high and acceptable. The collected data was analyzed by SPSS 18 software. Descriptive statistics including mean and standard deviation and frequency distribution tables were used to describe the research units. Statistical tests such as Kolmogorov Smirnov and Pearson correlation coefficients were used to analyze the data.

Findings:

[Downloaded from mail.intjmi.com on 2026-11-20]

[DOR: 20.1001.1.23222913.2019.8.3.3.7]

The mean age of the mothers was 31.13 ± 4.01, the youngest was 21 and 42 was the oldest, most were educated (53.3%). The mean weight of the mothers was 73.92±10.20 at pre-parturition. The mean duration of cesarean section was 56.18±12.61and most of the patients had at least two surgeries (52.2%). Also, the mean preoperative systolic blood pressure was 131.27±13.32and postoperatively 115.21 ±12.38, mean preoperative diastolic blood pressure 84.58 ±12.50 and postoperatively 68.38 ±14.02, mean preoperative heart rate 107.18±16.53 and 93.54±15.11 postoperatively, hemoglobin measured preoperatively was 12.53± 0.83 and 12.18 ± 0.97 postoperatively, mean hematocrit preoperatively 37.20±2.69 and postoperative cesarean section was 36.09 ±2.63 (Table 1)**.** Preoperative anxiety based on Spielberger's Anxiety Inventory was 48.20±4.68) and intraoperative hemorrhage was 221.33± 62.8 cc. Pearson correlation test showed a significant relationship. between cesarean delivery and preoperative anxiety. (P <0.05). (Table 2).

Discussion:

Cesarean section is one of the most common surgeries around the world where intraoperative bleeding is one of the major complications (11, 17). A person who comes to the operating room for cesarean section is anxious. Especially when spinal anesthesia is performed, this anxiety increases. In this study, we found that higher levels of anxiety were associated with higher rates of bleeding during and after cesarean section, indicating the importance of attention to mental health problems in pregnancy and its effective role in postpartum recovery.

This relationship may be due to the effect of anxiety during pregnancy on the immune system. In anxiety conditions, increased cortisol reduces immune cell proliferation and differentiation, altering gene expression and decreasing cell adhesion. In the repair of cesarean sections, proinflammatory cytokines play an important role in healing. Anxiety can delay wound healing by reducing these cytokines and prolong bleeding time (14). Also, decreased oxytocin secretion due to antenatal anxiety can decrease uterine contractions and thus increase bleeding (9), which has been confirmed by the effects of uterine atony and hypotonia in other studies (13, 18). Anxiety can also increase the amount of bleeding during surgery by affecting hemodynamic factors such as hypertension, which is in line with the findings of Koopman et al. At Groningen University of Medicine in the Netherlands (19).

Studies in pregnant women in Changsha, China have shown a positive correlation between anxiety during pregnancy and intrapartum hemorrhage (8, 9), which is in line with our findings.

A study conducted at Zurich University Hospital by van Connell et al., Chronic anxiety and stress, characterized by hyper coagulant status, was characterized by increased pre-coagulation molecules (fibrinogen and coagulation factor VII) and decreased fibrinolytic capacity (20). The findings of this study are in contradiction with our findings of an increase in the amount of bleeding in preoperative anxiety status, which can be justified by accepting the relatively acute course of anxiety

[Downloaded from mail.intjmi.com on 2026-11-20]

[DOR: 20.1001.1.23222913.2019.8.3.3.7]

experienced in women undergoing pre-cesarean section.

Our study had limitations. The first was the lack of sufficient information on the anxiety level of women of childbearing age in the community, which made it difficult to compare anxiety in pregnancy. Future studies are needed to determine whether there is a significant difference between anxiety in pregnant and non-pregnant women. Our second limitation on how to diagnose the existence and extent of anxiety was based on the completion of a Spiegel Berger questionnaire by a pregnant woman. Clinical interviews and longer follow-up are needed for more accurate assessments.

Conclusion:

Prenatal anxiety in pregnant women can increase bleeding during cesarean section. Given the high incidence of cesarean section and its effect as an independent factor in causing anxiety as a surgery, especially when undergoing spinal anesthesia while the person is awake during surgery, it is recommended to reduce anxiety in term pregnant women, including Prenatal education classes, familiarity with staff and operating room environments preopratively, psychological support of family and spouse, as well as use of pharmacological and non-pharmacological anxiety-reducing techniques prior to referral for cesarean section.

Acknowledgment:

This study is part of the dissertation approved by Master of Science in Critical Care at Gonabad University of Medical Sciences. We are grateful to the Vice Chancellor for Research of Gonabad University of Medical Sciences and the staff of Bohlul Gonabad Hospital for assisting in this study.

References:

1. Biaggi A, Conroy S, Pawlby S, Pariante CM. Identifying the women at risk of antenatal anxiety and depression: a systematic review. Journal of affective disorders. 2016;191:62-77.
2. Andersson L, Sundström-Poromaa I, Bixo M, Wulff M, Bondestam K, Åström M. Point prevalence of psychiatric disorders during the second trimester of pregnancy: a population-based study. American journal of obstetrics and gynecology. 2003;189(1):148-54.
3. Field T, Diego M, Hernandez-Reif M, Schanberg S, Kuhn C, Yando R, et al. Pregnancy anxiety and comorbid depression and anger: effects on the fetus and neonate. Depression and anxiety. 2003;17(3):140-51.
4. Chung TK, Lau TK, Yip AS, Chiu HF, Lee DT. Antepartum depressive symptomatology is associated with adverse obstetric and neonatal outcomes. Psychosomatic Medicine. 2001;63(5):830-4.
5. Kurki T, Hiilesmaa V, Raitasalo R, Mattila H, Ylikorkala O. Depression and anxiety in early pregnancy and risk for preeclampsia. Obstetrics & Gynecology. 2000;95(4):487-90.
6. Lee AM, Lam SK, Lau SMSM, Chong CSY, Chui HW, Fong DYT. Prevalence, course, and risk factors for antenatal anxiety and depression. Obstetrics & Gynecology. 2007;110(5):1102-12.
7. Sutter-Dallay AL, Giaconne-Marcesche V, Glatigny-Dallay E, Verdoux H. Women with anxiety disorders during

[Downloaded from mail.intjmi.com on 2026-11-20]

[DOR: 20.1001.1.23222913.2019.8.3.3.7]

pregnancy are at increased risk of intense postnatal depressive symptoms: a prospective survey of the MATQUID cohort. European Psychiatry. 2004;19(8):459-63.
8. XIAO Y, WANG H, TAN L. The influence of anxiety and depression to delivery mode or postpartum hemorrhage. Journal of Qiqihar Medical College. 2008;29(17):2086-7.
9. Zhou X, Li L. Prenatal anxiety and its influence on delivery outcome. Zhong nan da xue xue bao Yi xue ban= Journal of Central South University Medical sciences. 2011;36(8):803-8.
10. Madhavanprabhakaran GK, D'Souza MS, Nairy KS. Prevalence of pregnancy anxiety and associated factors. International Journal of Africa Nursing Sciences. 2015;3:1-7.
11. Cunningham F, Leveno K, Bloom S, Spong C, Dashe J. Williams obstetrics. 24, editor: Arjmand; 2014.
12. Miller R, Eriksson L, Fleisher L, Wiener-Kronish J, Cohen N, Young W. Miller's Anesthesia E-Book: Elsevier Health Sciences; 2014.
13. Suzuki S, Hiraizumi Y, Miyake H. Risk factors for postpartum hemorrhage requiring transfusion in cesarean deliveries for Japanese twins: comparison with those for singletons. Archives of gynecology and obstetrics. 2012;286(6):1363-7.
14. Werner S, Grose R. Regulation of wound healing by growth factors and cytokines. Physiological reviews. 2003;83(3):835-70.
15. Spinelli MG. Interpersonal psychotherapy for depressed antepartum women: a pilot study. The American journal of psychiatry. 1997.
16. Heron J, O'Connor TG, Evans J, Golding J, Glover V, Team AS. The course of anxiety and depression through pregnancy and the postpartum in a community sample. Journal of affective disorders. 2004;80(1):65-73.
17. Jouhari S, Bayati S, PoorAsadiKheirabadi F, Moradi E. Cesarean Section Rate and Its Cause in Fasa in the Year 2011. Journal of Fasa University of Medical Sciences. 2014;4(3):295-300.
18. Cunningham FG, Leveno K, Bloom S, Hauth J, Gilstrap L, Wenstrom K. Multifetal gestation. Williams Obstetrics. 2005;22:911-48.
19. Koopmans CM, van der Tuuk K, Groen H, Doornbos JP, de Graaf IM, van der Salm PC, et al. Prediction of postpartum hemorrhage in women with gestational hypertension or mild preeclampsia at term. Acta obstetricia et gynecologica Scandinavica. 2014;93(4):399-407.
20. von Känel R, Mills PJ, Fainman C, Dimsdale JE. Effects of psychological stress and psychiatric disorders on blood coagulation and fibrinolysis: a biobehavioral pathway to coronary artery disease? Psychosomatic Medicine. 2001;63(4):531-44.

Tables and Charts:

Table 1: Frequency distribution of variables studied.

[Downloaded from mail.intjmi.com on 2026-11-20]

[DOR: 20.1001.1.23222913.2019.8.3.3.7]

Variable	**Preoperative** (Mean and standard deviation)	**Postoperative** (Mean and standard deviation)
Systolic blood pressure	131.27±13.32	115.21±12.38
Diastolic blood pressure	84.58±12.50	68.38±14.02
Heart beat	107.18±16.53	93.54±11.15
Hemoglobin	12.53±0.83	12.18±0.97
Hematocrit	37.20±2.69	36.09±2.63

Table 2: Correlation of anxiety and bleeding during cesarean section.

Variable	**Preoperative** **(** Mean and standard deviation**)**	**Pearson correlation test result**
Preoperative anxiety	48.20±4.68	R= 0.572 P= 0.000
Intraoperative hemorrhage	221.33±62.8	

[Downloaded from mail.intjmi.com on 2026-11-20]

[DOR: 20.1001.1.23222913.2019.8.3.3.7]