

Original Research

PONV (Postoperative Nausea and Vomiting) Incidence among Patients with Caesarean Section, Enhanced Recovery After Surgery (ERAS), and Subarachnoid Block (SAB) Anesthesia



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Article Info	Abstract
Article history: Received: 13 August 2022 Accepted: 21 June 2023	<p>Introduction: ERAS has been widely demonstrated as an effective postoperative pain, nausea, and vomiting control method. Pain management that cuts the dosage of opioids up to 50%, involves intravenous fluid administration, and engages antiemetic medication combinations may propose a better outcome. This study aimed to know the PONV incidence after the ERAS procedure among cesarean section patients with subarachnoid Block (SAB) anesthesia.</p> <p>Methods: This was a quantitative study with a descriptive design. This study was conducted from 8th March to 30th April 2022, involving 60 post-caesarean sections with SAB and ERAS patients. Univariate analysis that presented a PONV incidence's frequency distribution was applied to address the study's aim.</p> <p>Results: The majority of participants were aged between 30 to 35 years (29; 48.3%), classified into the healthy weight group (33; 55%), and identified with the Bromage score of 1 (60; 100%). Fifty participants (83.3%) were not experiencing nausea and vomiting episodes after the procedure. Only seven (11.7%) and three (5%) participants reported mild and moderate nausea and vomiting episodes after the procedure, respectively.</p> <p>Conclusion: ERAS method is a sufficient technique presented in the caesarean section procedure. Findings confirmed its effectiveness in alleviating nausea and vomiting incidence after the surgery.</p>
Keywords: mother, caesarean section procedure, ERAS, PONV	

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INTRODUCTION

Caesarean Section is a delivery process of a fetus by an open surgical incision through the abdominal wall and uterus. Caesarean Section can be an alternative delivery method, considers a major surgery, and performs under conscious sedation, except in an emergency situation [1][2]. World Health Organization (WHO) in 2014, mentioned the increasing rate of Caesarean Section procedure globally, especially in developing and developed countries, such as Australia (32%), Brazil (54%), and Colombia (43%).

Caesarean Section procedure employs a spinal anesthesia technique. Postoperative nausea and vomiting (PONV) incidence are typical side effects following spinal anesthesia [3][4]. Twenty to forty percent of patients with spinal anesthesia had reported nausea and vomiting episodes within 24 hours following the procedure [4][5]. The Enhanced Recovery After Surgery (ERAS) protocol has been widely established as a novel and successful method of postoperative pain and nausea control. Pain management that cuts the dosage of opioids up to 50%, involves intravenous fluid administration, and engages antiemetic medication combinations may propose a better outcome [6][7].

Valen (2021) reported 785 patients from a total of 1055 surgical patients had undergone a caesarean section procedure in TK II Udayana Hospital. A pilot study was conducted from September to November 2021 to collect data from patients who had undergone the cesarean procedure with the Enhanced Recovery After Surgery (ERAS) method. Twenty patients were documented in

this study eventually. Patients were prescribed eight hours of fasting before the surgical procedure to prevent aspiration and fecal contamination during the surgery [8]. Anesthesiologists administered a low dosage of opioids during the procedure. The combination of fentanyl and morphine was only used in the intrathecal injection during the spinal anesthesia. Paracetamol in the dosage of 1 gr/100 ml and Peinlos Ibuprofen 500 ml were administered during the postoperative period. Data presented that 18 patients did not report any incidence of PONV. Only two patients reported mild nausea and vomiting episode [9]. Bromage score measurement was also applied to evaluate the motoric responses. Twenty patients showed early mobilization. In thirty minutes to an hour, a significant movement of the lower extremities was subsequently documented. Patients were also able to sit and walk within two hours following the surgery [10]. These findings suggest the advantageous effect of the ERAS method in alleviating PONV and enhancing early mobilization among the caesarean section with spinal anesthesia patients [11].

Research conducted by Damayanti, Anisa (2022) which assessed the comparison of the ERACS method and conventional methods for PONV with observation instrument sheets with direct interview techniques showed that the ERACS method was an effective method for reducing postoperative nausea and vomiting with a total sample of 15 respondents for each method of operation. Another study by Prayanangga (2022) explained that a literature study related to the use of the ERACS method was found to be

effective in helping to reduce PONV and reduce the time of a mother's stay in the hospital and reduce the number of maternal complications. However, the ERACS method in spinal anesthesia patients with PONV events as measured by the Rhodes Index Nausea Vomiting and Retching (RINVR) observation sheet has never been performed [12][13].

According to these findings, a study is required to examine the PONV Incidence on the ERAS Method among Caesarean Section Patients with Subarachnoid Block (SAB) in TK II Udayana Hospital.”

METHODS

Study Design

This was a quantitative study with a descriptive design. The total sampling technique was applied to recruit the study participants. A total of 60 patients with caesarean section and ERAS procedures were included in the study. The inclusion criteria were: 1) pregnant women who were referred to the hospital for elective caesarean section procedure, 2) primigravid or multigravida who were aged between 18 to 35 years old with single intrauterine pregnancy at 38 to 42 weeks of gestation, 3) undergone spinal anesthesia, and 4) used ERAS surgery protocol. The exclusion criteria included: 1) patients with a history of diabetes mellitus, hypertension, heart diseases, and hyperthyroidism, 2) suspected of toxoplasmosis virus infection, and 3) patients with obstetric emergency and complications.

Study Location and Duration

This study was conducted in TK II Udayana Hospital on 8th March to 30th April 2022.

Study Instruments

A standard observational sheet of Rhodes Index Nausea Vomiting and Retching (RINVR) was employed to collect the study data.

Data Collection

Administration requirements were initially fulfilled by proposing several documents to the Director of TK II Udayana Hospital for the study approval and authorization. The study information and informed consent were then subsequently obtained from the potential subjects. The study instrument was then applied to collect the demographic and PONV episodes from the eligible participants who had agreed to participate. The editing, scoring, coding, and tabulation process was conducted prior to the data analysis. SPSS 16 software program was used to analyze the collected data.

Data Analysis

The data analysis enrolled the demographic data of age, BMI, and Bromage Scores. A univariate test with the frequency distribution of PONV episodes among the caesarean section patients with ERAS procedure was presented in this study.

Study Ethics

The study's ethical approval had been granted by the Institute of Technology and Health Science Bali Ethic Committee with the number

RESULTS

Table 1 reveals that the majority of participants were aged between 30 to 35 years (29; 48.3%), followed by the aged 24 to 29 years (19; 31.7%), and 18 to 23 years (12; 20%). Thirty-three pregnant women were classified into the healthy weight range (55%). There were 23 participants (38.3%)

with overweight status. Only four participants were identified with obesity (6.7%). In addition, all participants were classified into Bromage Score of 1 (100%). According to the Table 2, 50 participants (83.3%) were not experiencing nausea and vomiting after the procedure. Only seven (11.7%) and three (5%) participants reported mild and moderate nausea and vomiting episode after the procedure, respectively.

Table 1

Frequency distribution according to the age, BMI, and Bromage Score among the caesarean section patients with ERAS procedure (n = 60).

Participant's Characteristic	Frequency (f)	Percentage (%)
Age		
18-23	12	20
24-29	19	31.7
30-35	29	48.3
BMI		
Underweight (<18.5)	0	0
Ideal weight (18,5-24.9)	33	55
Overweight (25-29.9)	23	38.3
Obese (>30)	4	6.7
Bromage Score		
Bromage 1	60	100
Bromage 2	0	0

Table 2

Frequency distribution of PONV incidence among patients with Enhanced Recovery After Surgery (ERAS) method.

PONV	Frequency (f)	Percentage (%)
No Incidence (0)	50	83.3
Mild (1-8)	7	11.7
Moderate (9-16)	3	5
Severe (17-24)	0	0
Very Severe (25-32)	0	0

DISCUSSION

This finding may signify the effectiveness of the Enhanced Recovery After Surgery (ERAS) method in the cesarean section procedure with SAB anesthesia in reducing the episode of postoperative nausea and vomiting.

The procedures in the ERAS are quite well organized. The preoperative element of ERAS consisted of health education and promotion of ERAS, fasting interval limitation, and carbohydrate loading restriction. Lower anxiety levels would lead to lower use of opioids that reduces the incidence of PONV eventually. Multimodal analgesia is given in the preoperative, intraoperative, and postoperative stages. Early oral intake, early urine catheter removal (six to twelve hours), early mobilization from the bedside, and early ambulation within 24 hours are included in the postoperative element [3][16][17].

Findings also discovered mild postoperative nausea and vomiting episodes among seven participants. Several participants confessed their incompliance with the fasting schedule advised before the surgery, thereby only summing an <6 hours of the total fasting period [18][17][19]. They claimed that their acute gastritis worsened with a long period of fasting. Hence, they cut their period of fasting without health professional's discretion. Another cause identified is delayed surgery start time. Emergency situations may contribute to these delays. This situation extends the fasting period and may induce PONV incidence [17][18][19].

ERAS combines several evidence-based operative tools to accelerate the recovery

process. It synchronizes perioperative management to accomplish remarkable goals of care [20][11]. The ERAS method could be conducted in various approaches, depending on the health professionals and the patient's preference. Patients' active engagement in the preoperative, perioperative, and postoperative stages had been comprehensively documented as an essential factor of surgical satisfaction. Mustofa (2019), in their study, reported that patients' participation had delivered a significant impact on the ERAS procedure [3][21].

The perioperative ERAS element consisted of a six to eight hours fasting period. The fasting period intends to reduce the PONV incidence due to esophagus reflux and abdominal manipulation. The minimum perioperative opioid use also reduces the side effects [22][8][6]. Early mobilization is an essential component after the surgery procedure. The Bromage Score is measured in the postoperative stage. Bromage score of 0 indicated the early movement of the lower extremities. Early mobilization was advised to be promoted among postoperative patients with a Bromage Score of 0 to improve pulmonary function, enhance tissue oxygenation, and facilitate the return of bowel function without PONV complications.

The implication of this research for nursing is that the Eras method is an effective method used in reducing the side effects of nausea and vomiting in patients with SC, so this method is the most effective method for patients with SC. The limitation of this research is the lack of in-depth studies about the application of ERAS in public and private

hospitals in the city of Denpasar, so that not all hospitals apply the ERAS method.

CONCLUSION AND RECOMMENDATION

The majority of participants were aged between 30 to 35 years, classified into the healthy weight group, and identified with the Bromage Score of 1. Fifty participants were not experiencing nausea and vomiting after the procedure. Only seven and three participants reported mild and moderate nausea and vomiting episodes after the procedure, respectively. Thereby, the ERAS method may propose as an effective and promising protocol for a caesarean section procedure.

CONFLICT OF INTEREST

Authors disclose no conflicts of interest related to the work in this manuscript.

REFERENCES

- [1] J. Ripollés-Melchor *et al.*, "Association between Use of Enhanced Recovery after Surgery Protocol and Postoperative Complications in Colorectal Surgery: The Postoperative Outcomes Within Enhanced Recovery after Surgery Protocol (POWER) Study," *JAMA Surg.*, vol. 154, no. 8, pp. 725–736, 2019, doi: 10.1001/jamasurg.2019.0995.
- [2] G. A. Macones *et al.*, "Guidelines for postoperative care in cesarean delivery: Enhanced Recovery After Surgery (ERAS) Society recommendations (part 3)," *Am. J. Obstet. Gynecol.*, vol. 221, no. 3, pp. 247.e1-247.e9, 2019, doi: 10.1016/j.ajog.2019.04.012.
- [3] M. Yusuf, T. Yasir, and R. Pratama, "Penerapan Protokol Enhance Recovery After Surgery (ERAS) Pada Pasien Operasi Elektif Digestif Sebagai Upaya Menurunkan Length Of Stay Pasien Pasca Pembedahan di RSUD dr. Zainoel Abidin Banda Aceh Tahun 2019," *J. Med. Sci.*, vol. 2, no. 1, pp. 16–20, 2021, doi: 10.55572/jms.v2i1.18.
- [4] D. K. B. Pardede, "Tinjauan atas Enhanced Recovery After Surgery (ERAS)," *Cermin Dunia Kedokt.*, vol. 47, no. 5, pp. 333–339, 2020.
- [5] E. M. A. P. Pradhana, T. G. A. Senapathi, I. P. P. Suarjaya, I. W. Aryabiantara, I. W. Suranadi, I. M. G. Widnyana, "Comparison between Low Flow and High Flow Sevoflurane Isocapnic Technique to Achieve Early Recovery after Surgery (ERAS)," *J. Glob. Pharma Technol.*, vol. 11, no. 1, pp. 250–255, 2019.
- [6] A. Sholihah, K. M. Sikumbang, and A. Husairi, "Gambaran Angka Kejadian Post Operative Nausea and Vomiting (PONV) di RSUD Ulin Banjarmasin Mei - Juli 2014," *Berk. Kedokt. Unlam*, vol. 11, no. 1, p. 121, 2016.
- [7] F. A. Hensley, G. P. Gravlee, D. E. Martin, and D. E. M. Frederick A. Hensley, Glenn P. Gravlee, *A Practical Approach to Cardiac Anesthesia*. 2012.
- [8] R. Firdaus, D. Britta, and H. Setiani, "Perbedaan Tatalaksana Mual Muntah Pasca Operasi pada Konsensus Terbaru : Tinjauan Literatur Differences in the Management of Postoperative Nausea

- and Vomiting in the Latest Consensus : Literature Review,” pp. 58–64, 2020, doi: 10.55497/majanestrcicar.v40i1.
- [9] T. T. Tika, L. Sidharti, R. Himayani, “Metode ERACS Sebagai Program Perioperatif Pasien Operasi Caesaragus,” *J. Med. Hutama*, vol. 03, no. 02, pp. 2386–2391, 2022.
- [10] R. T. Hendro, E. Pradian, and I. Indriasari, “Penggunaan Skor Apfel Sebagai Prediktor Kejadian Mual dan Muntah Pascaoperasi di RSUP Dr. Hasan Sadikin Bandung,” *J. Anestesi Perioper.*, vol. 6, no. 2, pp. 89–97, 2018, doi: 10.15851/jap.v6n2.1425.
- [11] R. Karnina and M. N. Ismah, “Gambaran Kejadian Postoperative Nausea and Vomiting (PONV) pada Pasien Pasca Tindakan Dilatasi Kuretase dengan Anestesi Umum di RSIA B pada Tahun 2019,” *Muhammadiyah J. Midwifery*, vol. 2, no. 1, p. 10, 2021, doi: 10.24853/myjm.2.1.10-20.
- [12] A. Damayanti, D. T. Yudono, and ..., “... Nausea & Vomiting (Ponv) pada Pasien Sectio Caesarrea dengan Metode Enhanced Recovery After Cesarean Surgery (Eracs) dan Sectio Caesarea Elektif di RSIA ...,” *... Nas. Penelit. dan ...*, pp. 687–692, 2022.
- [13] T. Pustaka, “Enhanced Recovery After Cesarean Surgery (ERACS): Analisis Berbasis Bukti,” vol. 14, pp. 274–287.
- [14] J. Jaata, “Pengaruh Intervensi Enhance Recovery After Surgery Pada Postoperative Terhadap Length of Stay: a Sistemik Review,” *Coping Community Publ. Nurs.*, vol. 9, no. 1, p. 107, 2021, doi: 10.24843/coping.2021.v09.i01.p14.
- [15] R. Setiawan, “Hermeneutika : Jurnal Hermeneutika Globalisasi dan Migrasi Tenaga Kerja Indonesia (Studi Deskriptif Sosiologi Kependudukan) Haryono,” *J. Hermeneut.*, vol. 4, no. 1, pp. 37–46, 2017.
- [16] T. N. Nguyen, B. L. Abramson, A. Galluzzi, M. Tan, A. T. Yan, and S. G. Goodman, “Temporal trends and referral factors for cardiac rehabilitation post-acute coronary syndrome in ontario: Insights from the canadian global registry of acute coronary events,” *Can. J. Cardiol.*, vol. 29, no. 12, pp. 1604–1609, 2013, doi: 10.1016/j.cjca.2013.10.002.
- [17] A. Razak, L. Lorna Lolo, and A. Aminuddin, “Hubungan Status Fisik American Society of Anesthesiologist (Asa) Dengan Bromage Score Pada Pasien Pasca Anestesi Spinal,” *J. Fenom. Kesehat.*, vol. 3, no. September 2019, pp. 378–383, 2020.
- [18] Sudadi, P. Sarosa, and H. Ferry, “Pengelolaan Pasien Di Post Anestesi Care Unit (Pacu),” *J. Komplikasi Anestesi*, vol. 3, no. 3, pp. 63–73, 2016.
- [19] N. Dewi, “Pengelolaan Hipotermi Pasien Sectio Caesarea Dengan Spinal Anestesi Melalui Pemberian Selimut Aluminium Foil Di Ibs Rs ...,” 2019.
- [20] Permenkes, *Pedoman Penyelenggaraan Pelayanan Anesthesiologi dan Terapi Intensif di Rumah Sakit*. 2011.
- [21] AANA, *Standards for Nurse Anesthesia Practice*. 2012.
- [22] N. A. S. Saputri, A. S. Prayogi, and I. Mardalena, “Waiting Time Pre Anestesi Berhubungan dengan Tingkat Kecemasan Pasien Pre Operasi,” vol. 16, no. 1, pp. 16–22, 2020.