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Case Report

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Implementation of Early Recovery After Caesarean Surgery Protocol in Floating Hospital (Case Series)

Akhyar Nur Uhud[1], Berta Lowta Welantika[2*], Senda Sulvain Rahmaningrat[2], Talitha Yuliaputri Aden[2]

[1] Department of Anesthesiology and Intensive Care, Faculty of Medicine, Airlangga University, East Java, Indonesia
[2] Faculty of Medicine, Airlangga University, East Java, Indonesia

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CORRESPONDING AUTHOR
Berta Lowta Welantika
bertawelantika@gmail.com
Faculty of Medicine, Airlangga University, East Java, Indonesia

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ABSTRACT

Introduction: Enhanced Recovery After Caesarean Surgery (ERACS) is a new concept that combines various evidence-based perioperative care to reduce post-operative complications and accelerate patient recovery after Caesarean Surgery (C-Section). The advantages of the ERACS Protocol, including accelerating patients' recoveries, shortening hospital stays, and reducing post-operative complications, make it suitable to be applied in floating hospitals. The problem is whether this protocol can be applied if it is carried out in a floating hospital with all its limitations. We would like to present our case series with modified ERACS protocol in Floating Hospital Ksatria Airlangga.

Case Presentation: We present 4 patients scheduled for elective C-Section. Neuraxial opioids with low-dose morphine, the most frequently used technique in ERACS, were not administered due to its unavailability in Ksatria Airlangga Floating Hospital. We provide pre-emptive analgesia and multimodal analgesia to obtain adequate perioperative analgesia. All patients were admitted to the nearest public health centre for post-operative observation and discharged after 1 to 2 days. Satisfaction was achieved in all patients without any significant postoperative complications.

Conclusion: The ERACS protocols' main goal can be achieved even under limited conditions, but several adjustments are required according to the available resources.

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INTRODUCTION

ERACS Protocol is a new concept that combines various evidence-based perioperative care protocols to accelerate patient recovery after section caesarean (SC) [1]. This protocol consists of preoperative, intraoperative, and postoperative care. Implementation of ERACS has been widely used and shows better outcomes than the conventional [2]. Floating Hospital Ksatria Airlangga is a ship designed to provide health services on remote islands throughout Indonesia. Once or twice a year, it often carries out social service events for 1 to 2 weeks on that island [3]. ERACS is suitable to be applied in social service due to its benefits and speed of recovery, the problem is whether this protocol can be applied if it is carried out in a floating hospital with all its limitations. In this case series, we tried to implement some of the ERACS components at our health social service event with Floating Hospital Ksatria Airlangga in remote islands.

CASE PRESENTATION

We tried to implement some ERACS protocols in 4 of our patients during a social service event with Floating Hospital Ksatria Airlangga, however, we were unable to apply all of the protocols, so we used the modified ERACS protocol instead. (Table 1). All of our patients were scheduled for elective section caesarean. The following is data from the four patients:

Patient 1

A woman, 19-year-old, weighed 57 kg and her height was 154 cm. She was diagnosed with primigravida and post-date (40/41 weeks). Vital signs were within normal limit and no abnormality found in the foetus.

Patient 2
A woman 22-year-old, weighed 64 kg and her height was 155cm. She was diagnosed with primigravida and marginal placenta previa. Vital sign were within normal limits, and no abnormality found in the foetus.

Patient 3
A woman, 30-year-old, weighed 68 kg and her height was 148 cm. She was diagnosed with multigravida with an abortion history and intrauterine growth restriction (estimated foetus weight 2300 grams). Vital signs were within normal limits, and no sign of fetal distress.

Patient 4
A woman, 41-year-old, weighed 65 kg and her height was 152 cm. She was diagnosed with elderly primigravida and oligohydramnios. Vital signs were within normal limits, and no sign of foetal distress.

There were no complications during surgery. Postoperative patients were observed at the nearest public health centre. Patients were admitted for 1 to 2 days and discharged if no complaints needed treatment. Only the 3rd patient was treated for 3 days because of waiting for the ship to take them home. The following data during and after surgery could be seen in Table 2. No significant complications were found in any patients, but there was moderate pain experienced by two patients. Only one patient requires additional analgesics because she was still experiencing pain 6 hours after surgery.

DISCUSSION

Floating Hospital Ksatria Airlangga has one operating room with a capacity of two operating tables that can perform minor to major operations (Fig.1). Floating Hospital Ksatria Airlangga has one recovery room in front of the operating room that is only assigned to one patient. This ship often conducts social service activities which last about 1 to 2 weeks long anually throughout the Indonesian archipelago [3]. This social service event only lasts a few days so the time for postoperative observation is limited, therefore we think that the ERACS protocol is suitable to be implemented. ERACS protocol consists of three key elements: effective preoperative preparation, intraoperative optimization and reduced postoperative complications that can be implemented both in emergency and elective cases.

Effective preparation consists of preadmission education and counselling about ERACS, effective preoperative fasting, avoidance of any unnecessary premedication and preoperative maternal comorbidity optimization [1,4]. Intraoperative optimization consists of effective prevention of postoperative infection, adequate anaesthesia management and specific surgical technique [1,5]. Reduction of postoperative complications with adequate pain management, early mobilization, nutrition and removing unnecessary catheters [1,6]. The main objective of ERACS is accelerating recovery, reducing maternal morbidity and mortality, improving maternal outcome and satisfaction, decreasing the length of hospital stay and limiting opioid use [7]. We were unable to implement

Table 1. ERACS Protocol in Floating Hospital Ksatria Airlangga

Preoperative elements
– Patient education with the healthcare provider (Anaesthesiologist, obstetric and paediatrician)
– Fasting: Last meal 6 hours before surgery and drink 2 hours
Intraoperative elements
– Prophylactic antibiotics (cefazoline 2 gr) 60 minutes before skin incision
– Ondansetron 4 mg intravenous before neuraxial anaesthesia
– Neuraxial anaesthesia with bupivacaine 12,5 mg and adrenaline 1:200.000
– Ephedrine 5-10 mg intravenous to treat hypotension intraoperative
– Dexamethasone 10mg intravenous before skin incision
– Ketamine 0,25mg/kg BW intravenous before skin incision
– Metamizole 1gr intravenous before skin incision
– Balance intraoperative fluid regimen with ringer lactate 1-2mg/kg BW/hour
Postoperative elements
– Bilateral Transversus Abdominal Plane (TAP) block with lidocaine 1% (30ml) after surgery
– Analgesic regimen: metamizole 1gr/8 hours intravenous and paracetamol 500mg/6 hours per oral for 24 hours after surgery
– Ondansetron 4mg/12 hours intravenous for 24 hours after surgery
– Early mobilisation and nutrition
– Removal of the urinary catheter within 24 hours after surgery

Table 2. Intraoperative and Postoperative Condition

	Patient 1	Patient 2	Patient 3	Patient 4
Intraoperative data				
Spinal height block	T6	T6	T4	T6
Surgery time (minute)	69	66	73	70
Delivery time* (second)	300	305	306	323
Intraoperative hypotension	No	No	Yes	No
Ephedrine used (mg)	0	0	15	0
Nausea/Vomit	No/No	No/No	Yes/No	No/No
Apgar score (baby)	7-8	8-9	7-8	6-7
Oxygen used (baby)	No	No	No	No
Postoperative data				
Spinal block time** (minute)	107	109	120	102
First mobilisation (minute)	113	148	127	107
Having a liquid diet (minute)	53	58	187	47
Having a full meal (minute)	383	598	487	857
Pain score*** 0 hours	1-2	3-4	2-3	2-3
Pain score*** 2 hours	0-1	3-4	2-3	0-1
Pain score*** 6 hours	0	1-2	0	0-1
Pain score*** 12 hours	0	0	0	0
Pain score*** 24 hours	0	0	0	0
Requirement extra analgesic	No	Yes/ Paracetamol 1 gr IV	No	No
Shivering	No	No	No	No
PONV	No	No	No	No
Length of stay (day)	2	3	2	1
Satisfaction	Yes	Yes	Yes	Yes

*Time from incision until baby delivery
** Time from spinal anaesthesia until Bromage 1 (fully recovery)
*** Pain score using WBFS (Wong-Baker Face Scale)

the entire ERACS protocol according to the guidelines, so we modified the ERACS protocol (Table 1) that suits the capabilities of Floating Hospital Ksatria Airlangga.

The primary goal of ERACS is to reduce the risk of postoperative complications such as postoperative pain so that patients can recover faster. Several methods can be used to treat postoperative pain with limited use of opioids and lesser side effects of anaesthesia intraoperative [8]. Neuraxial opioids are one of the techniques frequently used in ERACS, with low-dose morphine (<100 µg) being the most used drug. Low-dose morphine has been shown to provide adequate postoperative analgesia with lesser side effects such as pruritus (OR 0,34) or nausea-vomit (OR 0,44) [1,9,10]. In this case series, we do not use morphine neuraxial due to the unavailability of preservative-free morphine in Floating Hospital Ksatria Airlangga.

However, we use other techniques to obtain adequate postoperative analgesia. We used pre-emptive analgesia and multimodal analgesia to provide adequate analgesia perioperatively. Pre-emptive analgesia was achieved using intravenous corticosteroids, ketamine and NSAIDs. Intravenous Dexamethasone is able to prolong the analgesia effect with a lower VAS score until 24 hours and prolonged time to the requirement of first rescue analgesia [11]. Low-dose ketamine intravenous could also increase the analgesia efficacy of spinal anaesthesia by prolonging the first analgesia request and lesser analgesia consumption 24 hours postoperative with no significant difference in the incidence of side effects [12].

The role of NSAIDs in pre-emptive analgesia is still controversial, theoretically and clinically, but numerous studies have found that NSAIDs given preoperatively could lower postoperatively pain scores and opioid consumption [13]. In addition to pre-emptive analgesia, we also use multimodal analgesia for postoperative pain management. We performed a bilateral TAP block and a combination of oral paracetamol and intravenous NSAID (Metamizole) as postoperative analgesia. TAP block is not highly recommended in the ERACS protocol due to no beneficial effect compared with opioid neuraxial, except in patients under general anaesthesia or neuraxial opioids are prohibited [8]. In our case series, two patients experienced moderate pain (WBFS 3-5) during the first 2 hours postoperatively (but only one patient required an additional analgesic) and



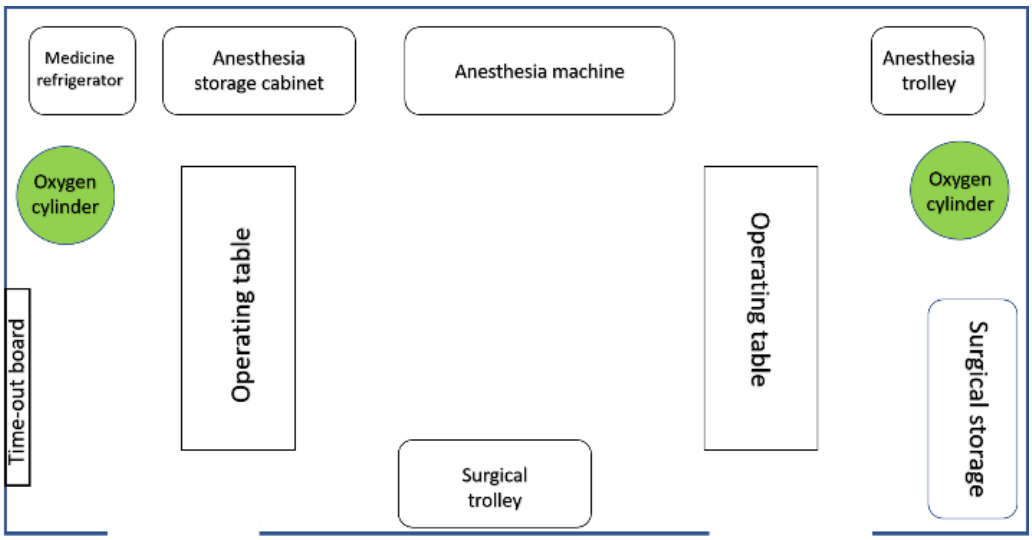


Fig 1. Floating Hospital Ksatria Airlangga Operating Room and Sketch

the others experienced mild pain (WBFS 0-2). All the patients had mild pain until 24 hours postoperatively.

Early mobilization and nutrition are essential postoperative elements in ERACS that could hasten the return of bowel function, promote early ambulation, reduce the risk of postoperative complications, and shorten the length of stay [1,6,8]. A meta-analysis study showed that having a liquid diet after 2 hours postoperative and a regular diet after 8 hours postoperative could help the recovery of bowel function and not increase the risk of postoperative complications [14]. There are no available data to show early mobilization can improve outcomes after caesarean delivery. Patients should immediately move independently at least two hours prior to surgery and again six hours following, according to the ERAS community [15]. In our case series, most patient begin to mobilise after 2 hours after surgery without experiencing any significant complaints. Three of four of our patients were able to start a liquid diet in less than 1 hour but one patient was able to start a liquid diet 3 hours after surgery because the patient was still

experiencing excruciating pain. Only one patient was able to start a complete diet after 6 hours after surgery, due to language barriers when we explained to the patient (only one of our patients understood Indonesian and the other only understood regional languages).

The main goal of ERACS is to provide perioperative services that can provide adequate analgesia, reduce the risk of postoperative complications, shorten the length of hospitalization, and provide patient satisfaction [8]. All our patients were satisfied with our ERACS protocol.

CONCLUSION

The ERACS protocol can be carried out even under limited conditions but several adjustments are required according to the available resources. The most important thing is that the main goal can still be achieved.

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CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

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