Jurnal Kesehatan Reproduksi
Vol 10 No 3 – Desember 2023
ISSN 2302-836X (print), ISSN 2621-461X (online)
Tersedia online di https://jurnal.ugm.ac.id/jkr
DOI: 10.22146/jkr.87457

CASE REPORT

Status Epilepticus Following Labor in a Remote Area: A Case Report of Puerperal Sepsis

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Submisi: 28 Juli 2023; Revisi: 18 Februari 2024; Penerimaan: 3 Maret 2024

ABSTRACT

Background: Puerperal sepsis is one of the five leading causes of maternal mortality worldwide commonly occuring in low to middle-income countries. Higher incidence is observed in rural areas where diagnostic and therapeutic interventions may be limited.
Case: A 21-year-old woman who developed a fever, abdominal pain, and foul-smelling vaginal discharge five days after giving birth. The patient convulsed five times in total before being admitted. She was diagnosed with status epilepticus caused by sepsis-associated encephalopathy and puerperal sepsis, which was successfully treated with antibiotics and supportive care.
Discussion: Pregnancy and the puerperium period involve significant changes in maternal physiology and immune function. The Society of Obstetric Medicine Australia and New Zealand (SOMANZ) has proposed an obstetric-modified quick sequential organ failure assessment (omqSOFA) for early recognition of maternal sepsis. A score of 2 or higher has predictive value for maternal sepsis.
Conclusion: Early recognition, appropriate treatment, and close monitoring are crucial for improving outcomes in patients with puerperal sepsis.

Keywords: puerperal sepsis, status epilepticus.

ABSTRAK

Latar Belakang: Sepsis puerperalis adalah satu dari lima penyebab utama kematian ibu di dunia, umumnya terjadi di negara berpenghasilan rendah hingga menengah. Insiden yang lebih tinggi diamati di daerah daerah perifer dimana intervensi diagnostik dan terapeutik terbatas.
Kasus: Wanita berusia 21 tahun mengeluhkan demam, sakit perut, dan keputihan berbau busuk lima hari setelah melahirkan. Keluhan disertai kejang lima kali sebelum dirawat. Pasien didiagnosis dengan status epileptikus yang disebabkan oleh ensefalopati akibat sepsis puerperalis, dan berhasil diobati dengan antibiotik dan perawatan suportif.
Pembahasan: Kehamilan dan periode nifas membuat perubahan fisiologis dan imunologis pada tubuh ibu. *The Society of Obstetric Medicine Australia and New Zealand* (SOMANZ) membuat *Obstetric-modified quick sequential organ failure assessment* (omqSOFA) untuk deteksi awal sepsis maternal. Skor lebih dari 2 memiliki angka prediktif untuk sepsis maternal.
Kesimpulan: Deteksi dini, pengobatan yang tepat, dan pemantauan ketat penting untuk meningkatkan perbaikan keluaran pada pasien sepsis puerperalis.

Kata Kunci: sepsis puerperalis, status epileptikus.

BACKGROUND

Puerperal sepsis is one of the five leading causes of maternal mortality worldwide and can be life-threatening.[1,2] It commonly occurs in low to middle-income countries. According to the World Health Organization (WHO) in Global Maternal Sepsis Study, maternal infection reached 5.7 million globally in 2017 and data from the 1990 suggested an incidence of 1-2 cases per 1000 livebirths.[3] A follow-up study of the 2010 Indonesian population census revealed an estimated 11 cases per 1000 live births in the maternal mortality rate due to puerperal sepsis. Higher incidence is observed in rural areas where access to advanced diagnostic and therapeutic interventions may be limited.[4] The diagnosis of puerperal sepsis can be challenging, especially in rural areas with limited resources and diagnostic tools. The diagnosis is typically based on clinical presentation, laboratory findings, and imaging studies, which may not be readily available in resource-limited settings. This case report emphasizes the importance of preparedness, resource optimization, and interdisciplinary collaboration in the management of puerperal sepsis in rural areas.

CASE PRESENTATION

We report a 21-year-old woman, para 1, referred to our emergency room (ER) with a complaint of multiple convulsions a day before admission. The patient had previously undergone labor and delivery helped by a local midwife four days prior to admission. The delivery was said to be uneventful, with small vaginal tears not requiring sutures. The patient was then discharged and continued care in her home.

The patient lived on a remote island in West Manggarai Regency, where local belief in traditional medicine is still deeply rooted. The patient's family admitted to inserting a mixture of pulverized herbs and burnt candlenut into the vaginal opening, and the same herbs are boiled and consumed as per local belief of routine post-labor care. The following day, the patient complained of local tenderness, slight pain in the lower abdomen, and is febrile. Two days following labor to the day of admission, the patient is reported to have slowly altered mental status, is increasingly sleepy, and produced yellow, foul-smelling, purulent vaginal discharge. One day before admission, the patient developed multiple generalized tonic-clonic seizures, reported as violent up-and-down shaking of extremities with loss of consciousness, foaming mouth, and an upward gaze. The seizures lasted for thirty seconds and thirty minutes in between. In between seizures, the patient regained consciousness but fatigued with no apparent weakness on either extremity. The patient convulsed five times in total before being admitted to the local primary healthcare facility.

En route to the hospital, the patient suffered one generalized tonic-clonic seizure and one seizure upon arrival in the ER. Upon stabilization using intravenous anticonvulsant, the patient was found to be somnolent (GCS E2V2M5), tachypneic (30x/mins), tachycardic (112x/mins), hypotensive (80/60 mmHg), was febrile (39^{o}C), and desaturated (88%). Obstetric examination revealed abdominal tenderness and purulent vaginal discharge. Fundal height was halfway between symphysis pubis and umbilicus, uterine contraction was adequate. On the vaginal opening was found dark-coloured unidentified pulverized material.

Neurologic examination showed altered mental status with a Glasgow Coma Scale (GCS) of E2V2M5, stupor, and disoriented. No cranial nerve abnormalities were identified. Meningeal signs were negative, physiologic reflexes and motoric tone were normal. Babinski and other pathological reflexes were found on the right and left lower extremities.

Initial laboratory tests found leukocytosis (15x10^{3}/µL), thrombocytopenia 120×10^{6}/L, severe hypokalemia (2,3 mmol/l), hypoalbuminemia (3,1 g/dl), hypercoagulation with elevated d-dimer (18,84 mg/dl). Urinalysis shows increased leukocyte and erythrocyte with no protein found. Other results for blood chemistry tests, renal and liver function tests were within normal limits. The patient was then consulted to our neurologist and obstetrician. Obstetric ultrasonography found no abnormalities in the uterus. Brain CT without contrast was normal. Due to limited resources electroencephalography, lumbar puncture, and blood culture were not performed. A working diagnosis of status epilepticus caused by sepsis-associated encephalopathy and puerperal sepsis was chosen.

Inpatient treatment with anti-epileptic drug regimens of valproic acid and benzodiazepine were initiated. Given the concern of bacterial infection, an empirical broad-spectrum antibiotic of cefotaxime 1g/8 hours and metronidazole 500mg/8 hours were administered. The patient was then intubated and transferred to our intensive care unit (ICU). During ICU care, midazolam infusion was initiated and up-titrated to 4mg/hour and administration of valproic acid 500mg/12 hours via nasogastric tube was given to achieve adequate seizure control. No seizure was observed during patient care in the ICU. Norepinephrine infusion was initiated and up-titrated to achieve adequate blood pressure control. Serial complete blood count and electrolyte panel demonstrated a recovering trend with normal white blood cell count ($8.34x10^3/\mu L$), albumin (3,6 g/dL), and normal electrolytes panel. The patient was then transferred to the ward after 5 days in ICU. The patient was ultimately discharged on valproic acid 500mg/12 hours per oral after 8 days of hospitalization.

DISCUSSION

Pregnancy and the puerperium period involve significant changes in maternal physiology and immune function, thus posing a challenge for diagnosis because normal physiologic change can mimic early sepsis symptoms.[5] Early recognition and treatment are crucial to improve maternal outcomes and reduce mortality rates. Obstetric-modified quick sequential organ failure assessment (omqSOFA), which is presented in Table 1, a scoring system allowing early recognition of maternal sepsis has been proposed by the Society of Obstetric Medicine Australia and New Zealand (SOMANZ).[6] The scoring system is based on assessing systolic blood pressure, respiratory rate, and mental status. An omqSOFA score greater than or equal to 2 has predictive value for maternal sepsis. According to recent studies, omqSOFA scoring has been verified to be more specific for diagnosing obstetric patients with highly suspected sepsis.[6] In this case, the Obstetric-modified quick sequential organ failure assessment (omqSOFA) score is 6 consisting of systolic blood pressure <90 mmHg, respiratory rate ≥ 25 breaths/min, and stupor.

Assessment for end-organ dysfunction should be taken in sepsis patients. The SOFA score is inappropriate for use in pregnant and postpartum settings, so SOMANZ proposed an obstetrically modified SOFA score (omSOFA). In order to demonstrate evidence of end-organ dysfunction, a score of ≥2 needs to be attained.[7–9]

Medical practitioners must possess proficiency in recognizing "red flag" indicators and symptoms, some of which are: fever higher than 38°C, heart rate higher than 90 beats/minute, hypotension with systolic blood pressure below 90 mmHg, tachypnea with a respiratory rate over 25/minute, pelvic pain, abnormal vaginal discharge, abnormal smell/foul odor of discharge, and delay in the rate of reduction of the size of the uterus.[6,10] In the present case, the patient was hypotensive, tachycardic, tachypneic, presence of abdominal pain, altered mental status, abnormal vaginal discharge, and abnormal odor of discharge. IIn this case, the obstetrically modified SOFA score is 5, which is the accumulation score of platelet count 120 ×106 /L, need vasopressor to maintain adequate mean arterial pressure, rousable by pain, and normal renal function test. Due to limited resources, the bilirubin and PaO2/FIO2 assessment (blood gas analysis) cannot be done.

Tabel 1. Obstetrically modified qSOFA score (omqSOFA)

Parameter	Score	
	1	2
Systolic blood pressure	≥90 mmHg	<90 mmHg
Respiratory rate	<25 breaths/min	≥ 25 breaths/min
Altered Mental Status	Alert	Not alert

Tabel 2. Obstetrically modified SOFA score (omSOFA)

System parameter	Score		
	0	1	2
Respiration			
PaO2/FIO2	≥400	300 to <400	<300
Coagulation			
Platelet (×106 /L)	≥150	100–150	<100
Liver			
Bilirubin (µmol/L)	≤20	20–32	>32
Cardiovascular			
Mean arterial pressure (mmHg)	MAP ≥ 70	MAP < 70	Vasopressors required
Central nervous system	Alert	Rousable by voice	Rousable by pain
Renal			
Creatinine(µmol/L)	≤90	90–120	>120

The source of bacterial transmission in puerperal sepsis can be divided into two categories: exogenous and endogenous. Endogenous bacterial infection is caused by commensal bacteria that physiologically reside in the vaginal cavity but infect through tissue damage after delivery (e.g. episiotomy wound, laceration), ascending infection from examining finger, or if there is prolonged rupture of membrane. Exogenous bacterial infection is caused by bacteria which are introduced into the vagina from the outside body. Several sources can be from unsterilized instruments, droplet infection from health providers, foreign substances that are inserted into the vagina (e.g. herbs, oil, cloth), or sexual activity. The classic infective organism in puerperal sepsis is group A hemolytic streptococcus. While group A streptococcal infections are reported from time to time, other organisms such as group B streptococci, gonococci, chlamydia, herpes simplex, genital mycoplasma, and bacterial vaginosis are more often involved. Uterine infection may start before the onset of labor, i.e., in cases of premature rupture of the membranes, during labor, or in the early postnatal period before wound site healing in the genital tract and the placental site have taken place.[7,8,11]

Following delivery, puerperal sepsis may be localized to the perineum, vagina, cervix, or uterus. Infection of the uterus can spread rapidly if a virulent organism is involved or in an immunocompromised patient. The infection can extend beyond the uterus to involve the fallopian tubes and ovaries, to the pelvic cellular tissue causing parametritis, to the pelvic peritoneum, causing peritonitis, and into the bloodstream causing septicemia. Severe infection can be further complicated by septic shock and coagulopathy.[10,12] Causes of sepsis in the puerperium outside the genital tract include mastitis, urinary tract infection, pneumonia, gastroenteritis, pharyngitis, and bacterial meningitis. Perineal wound infection including infection of episiotomy wounds, can also contribute to the development of sepsis.[12,13] Based on physical and laboratory examination in the present case, we expected the source of infection to be exogenous because of perineal wound infection caused by the insertion of pulverized herbs and burnt candlenut and also increased leukocytes in urinalysis as a sign of urinary tract infection due to insertion of pulverized herbs and burnt candlenut.

Sepsis is a life-threatening condition that requires early recognition. Obstetricians and other related physicians must be involved during sepsis recognition. They should maintain a high level of suspicion for sepsis and promptly perform appropriate investigations and monitor as soon as possible, including complete blood count, electrolytes, blood cultures, blood lactate, and urine output. Basic treatment according to the

SOMANZ guideline includes adequate oxygenation, adequate intravenous fluids, and broad-spectrum antibiotics in an hour to improve the patient's chance of survival.[10,12]

Definitive infectious agents can be confirmed by blood cultures taken immediately and sequentially, if possible before administration of antibiotics and their collection should not delay antibiotic treatment. Cultures also can be taken at the other site of the suspected source of infection, including urine cultures, vaginal and episiotomy wound swabs, lumbar puncture for cerebrospinal fluid (CSF) collection, respiratory tract swabs and caesarean wound swabs. Antibiotic treatment in puerperal sepsis should be appropriate for the suspected infection but also needs close monitoring for the side effects on breastfed infants because most antibiotics are found in breast milk. Arterial blood gases should be examined to determine the presence of hypoxia, hypercapnia, metabolic state and lactate level. Elevated lactate levels are an indication of tissue hypoperfusion, with values greater than 2 mmol/L being associated with increased mortality in pregnancy. Other laboratory investigations including creatinine urea and electrolytes, elevated creatinine is a sign of severe sepsis. Liver function tests may be elevated if sepsis source is from hepatic or perihepatic infection or due to septic shock affecting blood flow and metabolism. In this case, blood and CSF culture and blood gas analysis are unattainable due to inadequate resources.[7,10,12]

The primary goal of treatment is to maintain oxygenation and perfusion of vital organs while identifying and treating the underlying infection, which may require medical and surgical interventions. The SOMANZ guidelines for the investigation and management of sepsis in pregnancy have provided evidence-based guidelines to improve the management of sepsis.[6] Guideline recommends administering broad-spectrum antibiotics within one hour of suspected sepsis (golden hour), maintain oxygen saturation above 94% (correction of hypoxia), adequate fluid resuscitation, and maintain mean arterial pressure (MAP) of at least 65 mmHg. Adhering to these recommendations have been shown to improve patient outcomes and reduce mortality rates.[5,6]

In this case, our patient received broad-spectrum antibiotics less than 1 hour after sepsis was suspected, maintain oxygen saturation above 94% with intubation, and adequate fluid resuscitation to maintain MAP at least 65 mmHg, in line with the SOMANZ guideline stated that patients with highly suspected sepsis should receive antibiotics within 1 hour of diagnosis (golden period).

CONCLUSION

Puerperal sepsis is a rare but life-threatening condition that requires prompt recognition, appropriate treatment, and close monitoring. The case report presented in this study highlights the importance of considering puerperal sepsis in the differential diagnosis of febrile postpartum women and the need for early initiation of antibiotic therapy. The literature review conducted in this study provides insights into the epidemiology, pathogenesis, diagnosis, and treatment of puerperal sepsis and underscores the importance of interdisciplinary management of this condition. While the incidence of puerperal sepsis has declined in developed countries, it remains a major cause of maternal morbidity and mortality in resource-limited settings. Effective preventive strategies and improvement of the management of puerperal sepsis are of paramount importance, particularly in low- and middle-income countries..

REFERENCES

1. Lawson GW, Keirse MJNC. Reflections on the maternal mortality millennium goal. Birth Berkeley Calif. 2013 Jun;40(2):96–102.
2. Buddeberg BS, Aveling W. Puerperal sepsis in the 21st century: progress, new challenges and the situation worldwide. Postgrad Med J. 2015 Oct 1;91(1080):572–8.
3. Bonet M, Brizuela V, Abalos E, Cuesta C, Baguiya A, Chamillard M, et al. Frequency and management of maternal infection in health facilities in 52 countries (GLOSS): a 1-week inception cohort study. Lancet Glob Health. 2020 May 1;8(5):e661–71.

4. Afifah T, Tejayanti T, Saptarini I, Rizkianti A, Usman Y, Senewe FP, et al. MATERNAL DEATH IN INDONESIA: FOLLOW-UP STUDY OF THE 2010 INDONESIA POPULATION CENSUS. J Kesehat Reproduksi. 2016 Jul 1;7(1).
5. Greer O, Shah NM, Sriskandan S, Johnson MR. Sepsis: Precision-Based Medicine for Pregnancy and the Puerperium. Int J Mol Sci. 2019 Nov 1;20(21).
6. Bowyer L, Robinson HL, Barrett H, Crozier TM, Giles M, Idel I, et al. SOMANZ guidelines for the investigation and management sepsis in pregnancy. Aust N Z J Obstet Gynaecol. 2017 Oct 1;57(5):540–51.
7. Shields A, de Assis V, Halscott T. Top 10 Pearls for the Recognition, Evaluation, and Management of Maternal Sepsis. Obstet Gynecol. 2021 Aug 1;138(2):289.
8. Zhong X, Lin R, Zhang W, Huang S, Luo Y, Wang D. Epidemiology and clinical features of maternal sepsis: A retrospective study of whole pregnancy period. Medicine (Baltimore). 2022 Oct 7;101(40):e30599.
9. Blanco Esquivel LA, Urbina JM, Zerón HM. Approach to an obstetric prognosis scale: The modified SOFA scale. Ghana Med J. 2016 Sep;50(3):129–35.
10. RCOG RC of O& G. Bacterial Sepsis following Pregnancy Green-top Guideline. In: RCOG Green–top Guideline No 64b. 2012.
11. Ali A, Lamont RF. Recent advances in the diagnosis and management of sepsis in pregnancy. F1000Research. 2019 Aug 30;8:1546.
12. Lefebvre CW, Babich JP, Grendell JH, Grendell JH, Heffner JE, Thibault R, et al. Puerperal Sepsis. Encycl Intensive Care Med. 2012;1873–5.
13. Liu P, Zhang X, Wang X, Liang Y, Wei N, Xiao Z, et al. Maternal sepsis in pregnancy and the puerperal periods: a cross-sectional study. Front Med. 2023 May 16;10:1126807.