Journal of International Multidisciplinary Research

Evaluation of antibiotic prophylaxis in C-Section patients at RSIA Hikmah Sawi

Sarah Zielda Najib[1], Jumiati[2], Teguh Setiawan Wibowo[3]

Akademi Farmasi Yannas Husada Bangkalan[12], Bangkalan, Indonesia
STIE Mahardhika, Surabaya, Indonesia[3]
teguh10setiawan@gmail.com

Informasi Artikel

E-ISSN : 3026-6874,
Vol: 2 No: 2 Februari 2024
Halaman : 198-203

Keywords:
Antibiotic prophylaxis
Cesarean section
post SC patients

Abstract

The Caesarean section (C-section) rate increased steadily in the past two decades in Indonesia. People have a common belief that cesarean delivery is less painful, and safer than vaginal delivery. Risk factors for maternal infection are clearly recognised, therefore Antibiotic prophylaxis at caesarean section is widely recommended to prevent maternal infection. The study was designed to evaluate antibiotic prophylaxis use for prevention of surgical site infections (SSIs). Retrospective review of medical records of all post SC patients who received antibiotic were evaluated during October 2021 to march 2022. Among 4 different antibiotics used in post SC patients, the most frequently requested were first generation cephalosporins (50,13%), third generation cephalosporins-ceftriaxone & cefotaxime (16,89% and 3,95%) and the least frequently requested were metronidazole infusion (3,86%). Antibiotic use in post SC patients are effective strategies in reducing SSIs patients which was proven by no patients with SSIs were found during the research period.

Abstrak

Angka Operasi Caesar (*C-section*) terus meningkat dalam dua decade terakhir di Indonesia. Banyak orang percaya bahwa Operasi Caesar cenderung tidak terlalu menyakitkan dan lebih aman daripada persalinan pervaginal. Faktor resiko infeksi dari persalinan telah diketahui sehingga antibiotic profilaksis pada pasien pasca operasi Caesar sangat dianjurkan untuk mencegah terjadinya infeksi pada ibu. Penelitian ini bertujuan untuk mengevaluasi penggunaan antibiotic profilaksis untuk pencegahan infeksi luka operasi (SSIs). Retrospektif review dari rekam medis semua pasien pasca operasi Caesar yang menerima antibiotik dari oketober 2021 hingga maret 2022. Diantara 4 jenis antibiotik yang digunakan pada pasien pasca operasi Caesar, Sefalosporin golongan pertama adalah yang paling banyak diberikan sebanyak 50,13%, sefalosporin generasi ketiga, yaitu ceftriaxone dan cefotaxime sebanyak 16,89% dan 3,95% dan yang paling sedikit digunakan adalah metronidazole dalam bentuk infus sebanyak 3,86%. Penggunaan antibiotik profilaksis pada pasien pasca operasi Caesar merupakan strategi efektif dalam menurunkan pasien infeksi luka operasi yang dibuktikan dengan tidak ditemukan pasien infeksi luka operasi selama periode penelitian

Kata Kunci : antibiotik profilaksis, operasi Caesar, pasien pasca operasi Caesar

INTRODUCTION

The Caesarean section (C-section) rate increased steadily in the past two decades in Indonesia. the C-section rate increased from 4.0% in 1998 to 18.5% in 2017. In 2017, the C-section rate in urban areas (22.9%) was almost two times that in rural areas (11.8%). The RISKESDAS (Riset Kesehatan Dasar) showed that the Caesarean section rate in Indonesia is 17.6% in 2018 where the highest rate is DKI Jakarta, reaching 31.1% and the lowest rate is in Papua reaching 6.7%.

People have a common belief that cesarean delivery is less painful, safer, and healthier than vaginal delivery although C-section is only recommended when the life of the mother or fetus is at risk. Many women who experienced cesarean section delivery belief that the operation minimized potential harm to their infants and/or themselves. Many women reported that avoidance of possible harm was better achieved through the controlled application of cesarean section instead of the uncertainty and 'unnecessary' stress of delivering vaginally.

As a surgical procedure, cesarean delivery may be accompanied by a number of complications, surgical site infection (SSI) being one of them. Post-cesarean SSI may cause considerable morbidity and have

other substantial consequences in terms of prolonged maternal length of stay, socioeconomic implications, and increased healthcare costs. Therefore, the prevention of postoperative infection receives special attention from experts. Some studies showed the effectiveness of prophylactic antibiotics in reducing morbidity due to postoperative infections and have largely supported their use[7]. Risk factors for maternal infection are clearly recognised, including caesarean section and operative vaginal birth therefore Antibiotic prophylaxis at caesarean section is widely recommended to prevent maternal infection after operative vaginal birth.

Surgical antibiotic prophylaxis is defined as the use of antibiotics to prevent infections at the surgical site and can reduce the risk of postoperative wound infections. Prophylactic antibiotics are antibiotics given before, during, and after surgical procedures to prevent complications from infection or surgical site infection (SSI). Administration of prophylactic antibiotics after a surgical procedure from the first-administration which aims to surgical site infection (SSI) with all its consequences, such as increasing the average length of stay (ALOS), increasing treatment costs, and action is needed to overcome complications, decreased performance due to complications, and increased mortality.

METHODS

The research design was retrospective method through reviewed medical records of all v patients from October 2021 to March 2022 at RSIA Hikmah Sawi after ethical review committee approval. The indication of antibiotics was categorized as prophylaxis antibiotic. Prophylactic antibiotic treatment was defined as administration of antibiotics without any evidence of infection to prevent infection in patients at risk of developing infection mainly in postoperative patients. Data was collected through medical records included number of C-section patients, types and total antibiotic prophylaxis used during research period. The inclusion criteria was C-section patients using prophylaxis antibiotics with complete and legible medical records. The exclusion criteria was patients with other diseases such as hypertension and asthma who received antibiotics for treatment purpose then data was evaluated which included type, dose, and route administration of prophylaxis antibiotic.

RESULT AND DISCUSSION

During the research period, 738 women who underwent C-section and used prophylaxis antibiotic at RSIA Hikmah Sawi in Bangkalan are described in table 1. There five main indications of C-section surgery which were CPD (Cephalopelvic Disproportion), LETSU (Letak Sungsang), PEB (Preeklampsia Berat), BSC (Bekas Sectio Caesarea), APB (Ante Partum Bleeding). C-section surgery was selected based on total prophylaxis antibiotics used compared to other procedures such as Hysterectomy, Myomectomy, ECT (Ectopic Pregnancy), Curettage, Partus and vaginoplasty.

Table 1. Diagnostic categories of C-section

Indication	Total	Percentage (%)
PEB (Preeklampsia Berat)	142	19,24
APB (Ante Partum Bleeding)	115	15,58
LETSU (Letak Sungsang)	159	21,54
CPD (Cephalopelvic Disproportion)	185	25,08
BSC (Bekas Sectio Caesarea)	137	18,56
Total patient	738	100%

Cephalopelvic disproportion (CPD) occurs when there is mismatch between the size of the fetal head and size of the maternal pelvis, resulting in “failure to progress” in labor for mechanical reasons in which the consequence is obstructed labor that can endanger the lives of both mother and fetus. In table 1 showed that CPD is the most common cases at RSIA Hikmah Sawi reaching 185 patients who underwent C-section surgery. It might be the average body size of women in Bangkalan smaller than normal body size. This is linear with the high number of cases of stunting in Bangkalan which is closely

related to the poverty rate where Bangkalan is recorded to be in second place after Sampang, Sumenep third place and the lowest poverty rate is Pamekasan.

Table 2. Characteristics of women who gave birth

Gestational age	Total	Percentage (%)
Preterm 28-36 weeks	23	3,12
Aterm 37-41 weeks	448	60,70
Postterm > 42 weeks	267	36,18

The most C-section surgery during research period which were 448. Aterm is when the gestational age is 37 – 41 weeks. Aterm pregnancy is called a fairly month pregnancy with a gestational age of 37-41 weeks with a fetal weight of > 2500 grams, but maternity mothers in aterm pregnancy also have a risk of premature rupture of the amniotic. The Drug Use in hospitals is regulated by the pharmacy committee and monitored through Hospital formularium following the guidelines of the PPRA (Antibiotic Resistance Control Program) of RSIA Hikmah Sawi. Administration of antibiotics for SC Surgery patients is carried out before the procedure until the patient is declared able to return home.

Section Caesarea (SC) is a surgical procedure performed by giving an incision on the abdominal wall and uterus with the aim of assisting the delivery process by removing the fetus from the mother's womb. Sectio Caesarea or C-Section is a method of removing the results of conception through making incisions on the uterine wall through the abdomen due to several medical indications, namely placenta previa, preeclampsia, fetal distress, fetal and fetal abnormalities in order to reduce the risk of maternal death if giving birth normally.

Antibiotic prophylaxis is defined as the use of antibiotics before, during, and after a surgical procedure to prevent infections, and is common practice in and around operating theater. The administration of antibiotics in C-section patient were given before and after surgery orally or intravenous. The combinations of antibiotics in C-section patient are ceftriaxone or cefotaxime in SC surgery patients are then followed by peroral administration of cefadroxil and metronidazole antibiotics. Additional antibiotics of metronidazole are given during surgery if there is an indication of meconium, but if there is no indication then there is no administration of metronidazole. Administration of ceftriaxone injection given 30 minutes before SC surgery then continued with oral cefadroxil administration for five days effectively provides wound healing SC surgery.

According to guidelines for the use of antibiotics issued by the Ministry of Health, the recommendation for giving antibiotics given for Cesarean section is that Sefazolin 2 grams is given 30-60 minutes before intravenous incision of drip for 15 minutes and ASHP (American Society Health System Pharmacist) guidelines that sefazolin is the top choice of antibiotics recommended as a prophylactic antibiotic in patients with sectio caesarea delivery. Cefazolin is a first-generation cephalosporin antibiotic, which is highly active against Gram-positive coccus bacteria such as *pneumococci, streptococci, staphylococci, and some Enterobacter sp bacteria* with an action mechanism inhibiting cell wall synthesis from bacteria. The first-generation cephalosporin antibiotics in RSIA using cefadroxil monohydrate which same class as cefazolin, this is also in accordance with the guidelines for the use of prophylactic antibiotics for cesarean section is recommended the use of first-generation cephalosporin antibiotics.

Table 3. Frequency and percentage of antibiotic prophylaxis

Antibiotic prophylaxis	Antibiotic Group	Dose	Route	Percentage (%)
Ceftriaxone	Sefalosporin 3th generation	2 g	IV	16,89

Cefotaxime	Sefalosporin 3th generation	2 – 4 g	IV	3,95
Cefadroxil Monohydrate	Sefalosporin 1st generation	500 mg	PO	50,13
Metronidazole Infus	Nitroimidazol	500 mg/100 ml	IV	3,87
Metronidazole tablet	Nitroimidazol	500 mg	PO	25,16

IV : Intavena; PO : Peroral

From table 3, it can be seen that the highest antibiotic used is cefadroxil in a 6-month research period. Cefadroxil was administered to patients for 5 days at a dose 500 mg three times a day and administered 12 hours after SC surgery during hospitalization. The administration of cefadroxil is continued for 5 days in order to prevent the occurrence of infection in the surgical wound. The lowest antibiotics used are cefotaxime and metronidazole. Cefotaxime is given to patients who have an allergy to ceftriaxone this might cause the administration of cefotaxime is not as much as the administration of ceftriaxone. The administration of cefotaxime as a substitute for ceftriaxone because cefotaxime is an antibiotic that is in the same group as ceftriaxone. Ceftriaxone has the advantage of administering doses only once a day, while Cefotaxime requires two or three daily doses to achieve the same effect as Ceftriaxone. The dose of ceftriaxone administered intravenously is 2 g / day while the dose of cefotaxime is 2-4 g / day so the use of cefotaxime will be more to replace the therapeutic effect of ceftriaxone.

The administration of Metronidazole is given in 2 dosage forms, IV administration peroral infusions. Metronidazole infusion is administered when the patient with an indication of the partus of the caste and amniotic meconium. Partus Kasep is a long delivery accompanied by maternal and fetal complications. Meconium is when amniotic water that turns greenish or brownish in color, indicating that the neonate has secreted meconium, it becomes a sign that the neonate is in a state of stress and hypoxia. While metronidazole tablets are brought to patients when allowed to go home and given by dose twice a day for 5 days. The use of ceftriaxone and metroniodazole as prophylactic antibiotics given once before surgery has the same effectiveness compared to repeated use of antibiotics, in preventing infection in elective C-section surgery (Brahmana & Setyawati, 2020), This is reinforced by a research that the administration of a single dose of ceftriaxone and metronidazole has the same effectiveness as the administration of prophylactic antibiotics for 5 days so that it can streamline costs, reduce workload to hospital staff and may reduce the risk of antibiotic resistance. Metronidazole 500 mg is also most commonly used in patients undergoing emergency sectio caesarea to lower the incidence of fever, surgical wound infections, urinary tract infections, and endometritis. The use of prophylactic antibiotics in C-section surgery patients proved effective because no patients were found affected by surgical site infection (SSI) during the study period.

CONCLUSION

In conclusion, the data generated from this study would help in analyze the patterns of antibiotic use in the Hospital and decreased incident of antibiotic resistance. The antibiotic used in post SC patients during the research period are ceftriaxone, cefotaxime, cefadroxil monohydrate and metronidazole. The most antibiotic used is cefadroxil monohydrate which given orally and the least antibiotic used during the research period are metronidazole infusion and cefotaxime.

REFERENCES

Wyatt, S., Silitonga, P. I. I., Febriani, E., & Long, Q. (2021). Socioeconomic, geographic and health system factors associated with rising C-section rate in Indonesia: A cross-sectional study using the Indonesian demographic and health surveys from 1998 to 2017. *BMJ Open*, *11*(5). https://doi.org/10.1136/bmjopen-2020-045592

Tika, T. T., Sidharti, L., Himayani, R., & Rahmayani, F. (2022). Metode ERACS Sebagai Program Perioperatif Pasien Operasi Caesaragus. *Jurnal Medika Hutama*, *03*(02), 2386–2391

Zakerihamidi, M., Roudsari, R. L., & Merghati, E. (2015). Vaginal Delivery vs Cesarean Section : A Focused Ethnographic Study of Women's Perceptions in The North of Iran. *Ijcbnm*, *3*(1), 39–50.

Tully, K. P., & Ball, H. L. (2012). Misrecognition of need: Women's experiences of and explanations for undergoing cesarean delivery. *Bone*, *23*(1), 1–7. https://doi.org/10.1016/j.socscimed.2013.02.039.Misrecognition

Zuarez-Easton, S., Zafran, N., Garmi, G., & Salim, R. (2017). Postcesarean wound infection: Prevalence, impact, prevention, and management challenges. *International Journal of Women's Health*, *9*, 81–88. https://doi.org/10.2147/IJWH.S98876

Salim, R., Braverman, M., Teitler, N., Berkovic, I., Suliman, A., & Shalev, E. (2012). Risk factors for infection following cesarean delivery: An interventional study. *Journal of Maternal-Fetal and Neonatal Medicine*, *25*(12), 2708–2712.

Marni, H., Djanas, D., & Bachtiar, H. (2020). The Effect of Giving Prophylactic Antibiotic Ceftriaxone and Cefazolin and Giving Ceftriaxone Before and After Surgery to The Risk of Postoperative Wound Infection in Postoperative Patients. *Andalas Obstetrics and Gynecology Journal*, *4*, 77–86.

Knight, M., Chiocchia, V., Partlett, C., Rivero-Arias, O., Hua, X., Hinshaw, K., Tuffnell, D., Linsell, L., Juszczak, E., Enderby, H., Thakar, R., Sultan, A. H., Sanders, J., Pasupathy, D., Moore, P., Gray, J., & Khunda, A. (2019). Prophylactic antibiotics in the prevention of infection after operative vaginal delivery (ANODE): a multicentre randomised controlled trial. *The Lancet*, *393*(10189), 2395–2403. https://doi.org/10.1016/S0140-6736(19)30773-1

Munckhof, W. (2005). Antibiotics for surgical prophylaxis [3]. *Australian Prescriber*, *28*(5), 115. https://www.nps.org.au/assets/0e46c6c27c4b64b6-d40e27a8b474-34633742e8e222756ae85740985c8f2cc8d28a0ee8f8c6ef04270c415b5b.pdf

Kemenkes, R. (2021). Pedoman Penggunaan Antibiotik. In *Pedoman Penggunaan Antibiotik*.

Abbas, Q., Ul Haq, A., Kumar, R., Ali, S. A., Hussain, K., & Shakoor, S. (2016). Evaluation of antibiotic use in Pediatric Intensive Care Unit of a developing country. *Indian Journal of Critical Care Medicine*, *20*(5), 291–294. https://doi.org/10.4103/0972-5229.182197

Maharaj, D. (2010). Assessing cephalopelvic disproportion: Back to the basics. *Obstetrical and Gynecological Survey*, *65*(6), 387–395. https://doi.org/10.1097/OGX.0b013e3181ecdf0c

Kusnandar, Viva., (2022). 10 Kabupaten/Kota dengan Kemiskinan Tertinggi di Jawa Timur. available online at https://databoks.katadata.co.id/datapublish/2022/01/11/kabupaten-ini-merupakan-kantong-kemiskinan-jawa-timur

Putri, M. S., Titisari, I., & Setyarini, A. I. (2017). Hubungan Usia Kehamilan Dengan Komplikasi Pada Bayi Baru Lahir Di Rs Aura Syifa Kabupaten Kediri Tahun 2017. *Jurnal Ilmu Kesehatan*, *6*(1), 101. https://doi.org/10.32831/jik.v6i1.160

Pradana, T., & Surya, G. (2016). Karakteristik Ibu Bersalin dengan Ketuban Pecah Dini (ATERM & PRETERM) di Rumah Sakit Sanglah Denpasar Periode juli 2015-Juni 2016. *Jurnal Medika Udayana*, *9*(7), 92–97.

Dewi, A. P. S., Setianingsih, N. J., Maesaroh, S., Sulasih, U., Rahmadhani, W., & Novyriana, E. (2022). The Role of Early Mobilization on Wound Healing After Sectio Caesarea. *Journal of Sexual and Reproductive Health Sciences*, *1*(1), 7. https://doi.org/10.26753/jsrhs.v1i1.698

Susanto, I. M. (2022). *Elektrik Blanket dapat Mengurangi Kejadian Menggigil dan Hipotermi pada Pasien Post Operasi Sectio Caesarea*. 136–142. https://oaj.scipro-foundation.co.id/index.php/IJMS/article/view/51/40

Herawati, F., Yulia, R., Hak, E., Hartono, A. H., Michiels, T., Woerdenbag, H. J., & Avanti, C. (2019). A Retrospective Surveillance of the Antibiotics Prophylactic Use of Surgical Procedures in Private Hospitals in Indonesia. *Hospital Pharmacy*, *54*(5), 323–329. https://doi.org/10.1177/0018578718792804

Faridah, I. N. (2013). Pola Penggunaan Antibiotik Post Operasi Pada Pasien Yang Menjalani Operasi Gastrointestinal. *Pharmaciana*, *3*(2), 51–55. https://doi.org/10.12928/pharmaciana.v3i2.431

Brahmana, I. B., & Setyawati, I. (2020). Evaluasi Pemakaian Antibiotik Profilaksis Ceftriaxone Injeksi dan Cefadroxil Oral Terhadap Penyembuhan Luka Post Sectio Caesarea. *Smart Medical Journal*, *3*(2), 90. https://doi.org/10.13057/smj.v3i2.42014

Armalita, S. V. (2018). *STUDI PENGGUNAAN CEFAZOLIN PADA PASIEN FRAKTUR TERTUTUP (Penelitian dilakukan pada Kasus Orthopaedi di Unit Rekam Medis Rumah Sakit …* [Universitas Airlangga]. http://repository.unair.ac.id/id/eprint/76950

Novietaningtyas, W., Kurniasih, S., & Fhatonah, N. (2020). Evaluasi Penggunaan Obat Antibiotik Profilaksis Pada Pasien Operasi Sesar (Sectio caesarea) Di RSUD Kabupaten Tangerang Tahun 2018. *Jurnal Farmagazine*, *7*(2), 68. https://doi.org/10.47653/farm.v7i2.425

Badan Pengawas Obat dan Makanan. (2022). *Peraturan badan pengawas obat dan makanan no.23 tahun 2022*. Available online at https://jdih.pom.go.id/download/product/1415/23/2022

Nugraha, N., & Hussein, Z. (2014). G2P1A0 Aterm Pregnancy Inpartu Singular Embryo Life Presentation Of Head

With Partus Kasep. *Hematemesis Melena Et Causa Gastritis Erosif Dengam Riwayat Penggunaan Obat Nsaid Pada Pasien Laki-Laki Lanjut Usia.*, *2*(September), 72–78.

Kosim, M. S. (2011). Pemeriksaan Air Ketuban. *Sari Pediatri*, *11*(5), 379–384.

Igwemadu, G. T., Eleje, G. U., Eno, E. E., Akunaeziri, U. A., Afolabi, F. A., Alao, A. I., & Ochima, O. (2022). Single-dose versus multiple-dose antibiotics prophylaxis for preventing caesarean section postpartum infections: A randomized controlled trial. *Women's Health*, *18*. https://doi.org/10.1177/17455057221101071

Maulidya, N. N., Yulia, R., & Herawati, F. (2022). Kajian Literatur: Pola Penggunaan Antibiotik Profilaksis Pada Pasien Dengan Persalinan Sectio Caesarea. *Biomedika*, *14*(1), 33–45. https://doi.org/10.23917/biomedika.v14i1.13632