

USE OF PROPHYLACTIC ANTIBIOTICS IN PATIENTS UNDERGOING CAESAREAN SECTION AT CUT MEUTIA GENERAL HOSPITAL, NORTH ACEH 2021-2022

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ABSTRAK

Sectio caesarea adalah tindakan operasi untuk mengeluarkan janin melalui sayatan pada lapisan perut dan rahim. Persalinan sesar dilakukan dengan mempertimbangkan tanda-tanda klinis dari ibu dan janin., seperti placenta previa, letak abnormal pada janin, serta tanda-tanda yang berbeda yang dapat membahayakan keberadaan ibu atau embrio. Menurut World Health Organization (WHO) jumlah tindakan persalinan dengan bedah sesar mengalami peningkatan yang secara langsung relatif terhadap peningkatan tingkat kontaminasi infeksi luka operasi (ILO). Antibiotik profilaksis merupakan salah satu pencegahan infeksi luka operasi. Penelitian yang digunakan yaitu bersifat deskriptif retrospektif. Teknik Pengambilan sampel pada penelitian ini menggunakan menggunakan non-probability sampling yaitu total sampling. Penelitian ini menunjukkan penggunaan antibiotik profilaksis pada pasien sectio caesarea yaitu ceftriaxone 51,2% dan cefotaxime 48,8%, penggunaan antibiotik profilaksis di Rumah Sakit Umum Cut Meutia Aceh berdasarkan ASHP penggunaan antibiotik ceftriaxone, cefotaxime, dan mereponem yaitu 100% tidak sesuai dan berdasarkan PPRA RSU Cut Meutia yaitu 100% sesuai. Penelitian ini menyimpulkan bahwa penggunaan antibiotik berdasarkan ASHP yaitu tidak sesuai dan berdasarkan PPRA RSUD Cut Meutia yaitu sesuai.

ABSTRACT

Use of Prophylactic Antibiotics In Patients Undergoing Caesarean Section At Cut Meutia General Hospital, North Aceh 2021-2022. Caesarean section is a surgical procedure to remove the fetus through an incision in the lining of the abdomen and uterus. Cesarean delivery is performed by considering clinical signs of the mother and fetus, such as placenta previa, abnormal location of the fetus, as well as different signs that may endanger the existence of the mother or embryo. According to the World Health Organization (WHO), the number of cesarean deliveries has increased, which is directly relative to the increase in the contamination rate of surgical wound infection (ILO). Prophylactic antibiotics are one of the prevention of surgical wound infection. The research method used is retrospective descriptive. The sampling technique in this research uses non-probability sampling, namely total sampling. The aftereffects of this review show that the use of prophylactic antibiotics in caesarean section patients, namely ceftriaxone 51.2% and cefotaxime 48.8%, the use of prophylactic antibiotics at the Cut Meutia Aceh General Hospital based on ASHP, the use of antibiotics ceftriaxone, cefotaxime, and reponem is 100% inappropriate and based on PPRA RSU Cut Meutia which is 100% compliant. The aftereffects of this study presumed that the utilization of anti-toxins based on ASHP is not appropriate and based on PPRA Cut Meutia Hospital is appropriate.

INTRODUCTION

Caesarean section is a surgical process to deliver the fetus through an incision in the abdominal wall and uterine wall. Delivery using the SC method is carried out based on medical indications from both the mother and fetus, such as placenta previa, abnormal position of the fetus, as well as other indications that can endanger the lives of the mother and fetus.¹

According to the Ministry of Health (KEMENKES), in 2019 the incidence of childbirth in Indonesia was 17.6%, and the highest was in the DKI Jakarta area at 31.3%, and the lowest was in Papua at 6.79.² From data obtained by North Aceh district in 2019-2021, there were 335 people who underwent caesarean section procedures.³

According to *World Health Organization* (WHO) the increase in the number of deliveries by caesarean section is directly proportional to the increase in the incidence of post-operative surgical wound infections (ILO), surgical wound infections occur in 2-5% of the 27 million patients who are operated on every year. Surgical wound infections are caused by bacterial contamination of the surgical site, which can occur in various ways including damage to the hollow viscus wall, normal bacterial flora on the skin, and poor sterile surgical technique which can cause exogenous contamination of the surgical team, equipment and the surrounding environment.³

The increase in the incidence of surgical wound infections (ILO) is influenced by several other factors, such as diabetes mellitus, value *American Society of Anesthesiologist* (ASA), administration of prophylactic antibiotics, duration of labor, width of the membrane wound, duration of monitoring wound care, emergency delivery, duration of operation, blood loss, surgical skills, length of post-operative care, *body mass index* (BMI), and wound closure techniques using the staple method.⁴

In SC procedures, prophylactic antibiotics are given before there are signs of infection. Inappropriate use of prophylactic antibiotics can cause treatment to be ineffective, increase the risk of resistance and increase the risk of morbidity, mortality and health costs. Inaccurate use of antibiotics is still often found in developing countries such as Indonesia.⁵

Based on data from section *Infection Prevention Control Nurse* (IPCN) or infection prevention and control nurse at Cut Meutia Hospital, North Aceh Regency, it was found that in 2018 there were 10 cases of secondary infection and 4 of them were post SC cases, in 2019 there were 2 cases of post SC secondary infection, in 2020 There was 1 case of post-operative secondary infection, and in March 2020 there were 3 cases of post-operative secondary infection, 1 of which was post-SC surgery. Based on the results of research that has been carried out, it can be concluded that: There is an influence of age on the incidence of post-Caesarean wound infection in hospitals. General Cut Meutia, North Aceh Regency.⁶ This research aims to determine the appropriateness of using prophylactic antibiotics at Cut Meutia Hospital, North Aceh using the Gysens method based on ASHP guidelines and a description of prophylactic antibiotics in patients. *section caesarea* used is in accordance with the guidelines.

METHOD

This research is observational research. This research was conducted in the medical records section of the Cut Meutia General Hospital, North Aceh. The sample for this study was all medical record data from patients who received prophylactic antibiotic therapy *caesarean section* at the Cut Meutia General Hospital, North Aceh from January 2021 to November 2022 there were 124 patients, consisting of 78 cases in 2021 and 46 cases in 2022 which were taken using the technique

total sampling. Data analysis uses univariate analysis to describe or explain the suitability and description of the use of prophylactic antibiotics under study.

RESULTS

The results of this study were obtained from univariate analysis, namely an analysis that describes the suitability and description of the use of prophylactic antibiotics studied, namely based on age, type of antibiotic, use of antibiotics. Based on table 1, it is found that the majority of patient age groups undergo *section caesarea* were 26-35 years old as many as 66 patients (53.2%)

Table 1 Distribution of Characteristics Based on Age

Age	Frequency (n)	Percentage (%)
<17 Years	3	2,4
17-25 Years	43	34,7
26-35 Years	66	53,2
36-45 Years	12	9,7
Total	124	100,0

Based on table 2, it is found that the type of antibiotic that is most often used by Cut Meutia Hospital in patients *caesarean section* was Ceftriaxone as many as 63 patients (50.8%)

Table 2 Distribution of Antibiotic Use Based on Antibiotic Type

Types of Antibiotics	Frequency (n)	Percentage (%)
Ceftriaxone	63	50,8
Cefotaxime	60	48,4
Meropenem	1	0,8
Total	124	100,0

Table 3 Suitability of Prophylactic Antibiotic Use Based on the Gyssens Method (ASHP 2013)

Antibiotics	0	I	II	II	II	III	III	IV	IV	IV
			C	B	A	B	A	D	C	B
Ceftriaxone	0	0	0	0	0	0	0	0	0	0
Cefotaxime	0	0	0	0	0	0	0	0	0	0
Meropenem	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0

IV	IN	WE	%
A			
63	0	0	50,8%
60	0	0	48,4%
1	0	0	0,8%
124	0	0	100%

Based on table 3, it is found that the appropriateness of using antibiotics is based on the 2013 ASHP guidelines using the method *Gyssens* is 100% inappropriate. Based on table 4, it is found that the appropriateness of using antibiotics is based on the Cut Meutia Hospital PPRA guidelines using the method *Gyssens* is 100% appropriate

Table 4 Suitability of Prophylactic Antibiotic Use Based on the Gyssens Method (PPRA RS Cut Meutia)

Antibiotics	0	I	II	II	II	III	III	IV	IV	IV
			C	B	A	B	A	D	C	B
Ceftriaxone	63	0	0	0	0	0	0	0	0	0
Cefotaxime	60	0	0	0	0	0	0	0	0	0
Meropenem	2	0	0	0	0	0	0	0	0	0
Total	124	0	0	0	0	0	0	0	0	0

IV	IN	WE	%
0	0	0	50,8%
0	0	0	48,4%
0	0	0	0,8%
0	0	0	100%

DISCUSSION

From the research results, it was found that the mother underwent the procedure *caesarean section* age group <17 years as many as 3 people (2.4%), 17-25 years as many as 43 (34.7%), 26-35 years as many as 66 (53.2%), and 36-45 years as many as 12 (9.7%). Age is the age experienced by a person as measured based on the last birthday. This research is not in accordance with the theory which explains that the age >35 years and <20 years is the age that is more commonly carried out *caesarean section*. In general, a good fertile age for preparing for pregnancy and childbirth is 20-35 years.⁷

Cesarean section at the age of 20-35 years is caused by the mother's medical history which is not possible at that age, resulting in complications in the birthing process which can result in death or failure to give birth. Pregnancy complications can have an impact on the birth process so caesarean section is the best effort to expel the fetus. Labor not progressing, preeclampsia, premature rupture of membranes (KPD), fetal distress, fetal position abnormalities, and gemelli babies are complications that occur.⁸ The results of this study are in line with studies Amir (2020) which shows viz 108 respondents were used as samples, 10 respondents aged < 20 (9.3%), 77 people aged 20-35 (71.3%), and 21 people aged > 35 (19.4%).⁹ The cause is the development of indications, both from medical indications, namely maternal and fetal factors, as well as social indications.

Adult age also significantly influences the injury recovery process after caesarean section. As you age, your metabolic rate will decrease. The cell repair process occurs along with a person's development or age, but the injury recovery process occurs more slowly when facing maturity factors.¹⁰ Winkosastro (2018) said that the danger times in the regenerative period are ages <20 years and >35 years, arguing that maternal deaths in pregnant women and carrying offspring are in the period <20 years.¹¹

Based on the research data obtained, namely It was found that the most widely used type of antibiotic was Cefadroxil, namely 44.4% in the period before and it was found that its use increased by 53.5% after the implementation of the campaign and the type of therapy found most frequently was ADU, namely 64.2% before the implementation of the campaign. and 61.6% in the period after the campaign was implemented.¹² *Caesarean section (SC)* is a surgical procedure that has a high risk of infection. Prophylactic antibiotics can minimize exposure to germs or microbes in the target area of surgery so they are often used widely in surgical procedures, The recommended prophylactic antibiotic is cefazolin, a first generation cephalosporin with a dose of 1 gram intravenously and given 15-60 minutes before the caesarean section procedure begins.¹³

Cut Meutia Hospital, North Aceh uses 3 types of antibiotics, namely Ceftriaxone, Cefotaxime, and Meropenem for SC procedures. Ceftriaxone is an antibiotic that has a broad spectrum and is a third generation cephalosporin antibiotic. Recommendations for the use of prophylactic antibiotics Ceftriaxone and Cefazolin which have broad spectrum capabilities for gram-negative and positive grams so that they can inhibit bacteria during surgery.¹⁴ This is in line with Pratiwi's (2023) research that Ceftriaxone is the right choice because this operation is included in the clean surgery class category. However, in this case Ceftriaxone also has disadvantages such as being less active against gram-positive bacteria compared to the class I generation cephalosporins.¹⁵

Another type of antibiotic used is Cefotaxime. Cefotaxime also has effectiveness in preventing post-operative infections as a prophylactic antibiotic but is not as strong as cefazoline. This is because Cefotaxime is a broad spectrum antibiotic and is more active against gram-negative bacteria. However, caesarean section surgical wounds are more often caused by gram-positive bacteria so that cefotaxime administration is less effective in SC and often causes resistance as a prophylactic antibiotic (16). Cefotaxime has a role in bacterial cell wall inhibition with a more prominent capacity than second-generation cephalosporins against certain negative microbes, and the broad antibacterial range of this class can promote superinfection against safe microorganisms or parasites (17).

From this research, it was found that 1 respondent used the antibiotic Meropenem. Meropenem is one of the most frequently used types of carbapenem antibiotics. Meropenem is a broad spectrum beta lactam antibiotic and is in second place in antibiotic prescription (18). If the patient is resistant to beta lactam antibiotics and cephalosporins, then meropenem can be given. Carbapenem antibiotics are very effective in treating infections caused by gram-negative bacteria that produce ESLB (*extended spectrum beta lactamase*), so it is recommended for use in patients who experience resistance to beta lactams (19). However, because surgical wound infections in SCs are often caused by gram-positive bacteria, the administration of Meropenem can be said to be less effective.

The use of prophylactic antibiotics in SC patients at Cut Meutia Hospital, North Aceh is inappropriate because the type of antibiotic used is classified as category IVA, which means there are other antibiotics that are more effective. As per other studies, irrational antibiotics in infectious diseases are also used (20). The three types of antibiotics used (Ceftriaxone, Cefotaxime, Meropenem) are classified as category IV A, namely the use of antibiotics that are used inappropriately according to ASHP guidelines *Therapeutic Guidelines* 2013. This guideline serves as a standard for the rational, safe and effective use of antibiotics for the prevention of surgical site infections (SSI). Based on actual clinical evidence and current issues (17).

According to ASHP *Therapeutic Guidelines* In 2013, the recommended first line prophylactic antibiotics were Cefazolin 1g IV or Ampicilin 2g IV. Second line (in patients who are allergic to

cephalosporins or penicillins) is Clindamycin 600 mg IV or Gentamicin 60-80 mg IV (17). From the results of measuring body temperature and examining leukocytes before and after SC, it is known that cefazolin is more effective. In addition, Cefazolin can inhibit the process of wound infection after SC, such as no swelling, no redness, and no scar fluid (21). Patients receiving systemic antibiotics (82.40%). The most commonly prescribed antibiotics were ceftriaxone (28.44%) and metronidazole (26.36%). This study also found that most patients received antibiotics for seven days or for five days, and only 1.08% of patients received antibiotics for a maximum of one day. This study shows that there are major problems in selecting appropriate antibiotics and in the duration of their use compared with the surgical prophylaxis guideline recommendations issued by the Saudi Ministry of Health. Therefore, there is an urgent need to improve compliance with surgical antibiotic prophylaxis guideline recommendations to reduce the occurrence of negative consequences (22). However, based on medical record data at Cut Meutia Hospital, North Aceh, the antibiotic type Cefazoline could not be found or used, but almost all 63 patients were given Ceftriaxone, which means that the administration of Ceftriaxone was not in accordance with the 2013 ASHP guidelines.

However, this is different from the Antimicrobial Control Program (PPRA) guidelines at Cut Meutia Hospital. The use of prophylactic antibiotics in caesarean section patients is included in category 0, which means it is appropriate. The lack of standard use of prophylactic antibiotics under the PPRA is not specific based on the category of surgery/action.

CONCLUSION

The conclusion of this research is the suitability of prophylactic antibiotic use at Cut Meutia Hospital, North Aceh using the Gyssens method based on ASHP guidelines, namely ceftriaxone 100% inappropriate, cefotaxime 100% inappropriate, and meropenem 100% inappropriate. Based on the PPRA of Cut Meutia Hospital, North Aceh, ceftriaxone is 100% appropriate, cefotaxime is 100% appropriate, and meropenem is 100% appropriate.

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