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Original Research

Evaluation Of The Use Prophylaxis Antibiotic In Cesarean Section Patients In The Central Surgical Installation

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ABSTRACT

Background: *Caesarean section is the delivery through a surgical incision in the abdomen and uterus with various risks, such as Surgical Site Infection (SSI). This research aims to evaluate the use of prophylactic antibiotics and observe the outcome of prophylactic antibiotic therapy in cesarean section patients.*

Methods: *This non-experimental research used descriptive methods and the data were obtained retrospectively from medical records. The data covered the type of antibiotic used, the dose used, the route of administration, and the time of administration. The results of the study were compared with the ASHP Therapeutic Guidline which is then measured using the percentage formula.*

Results: *The results showed from the 54 patients, most of them aged 20-34 years (63.0%) with a gestational age of 37-42 weeks (96.2%), and length of treatment of 4 days (72.2%). There are 5 types of indications in the cesarean section patients and the highest case is the patients with a history of cesarean section.*

Conclusion: *Based on research on the use of prophylactic antibiotics in cesarean section patients at the Pertamina Bintang Amin Hospital Surgical Center Lampung in 2019 – 2020, it has not met the ASHP Therapy Guidelines. Because of the four analyzes, only the dose, route of administration, and time of administration met 100% of the ASHP Therapeutic Guidelines. Meanwhile, the analysis of the types of prophylactic antibiotics does not comply with the ASHP Therapeutic Guidelines. The therapeutic showed a good outcome based on the patient's body temperature.*

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INTRODUCTION

The condition of cesarean sections in the world continues to increase in prevalence. The number of deliveries by the cesarean method has increased worldwide and exceeds the 10%-15% range recommended by the World Health Organization (WHO) to save the mothers and babies lives. Latin America and the Caribbean region

contributed the highest number of cesarean methods at 40.5%, followed by Europe (25%), Asia (19.2%), and Africa (7.3%).

Based on the results of the 2018 Basic Health Research (Riskesdas),the prevalence of cesarean delivery in childbirth in Indonesia was 17.6%, in which the highest was in the Special Capital Region of Jakarta (31.3%) and the lowest was in Papua (6.7%) (Sulistianingsih & Bantas, 2019). Cesarean sections nowadays are much safer than before, thanks to the advances in antibiotics, blood transfusions, anesthesia, and improved surgical techniques. However, there is a negative effect of post-cesarean surgery, namely the risk of surgical wound infection (ILO). Prophylactic antibiotics can reduce infection rate and reduce ILO risk (Nurkusuma and Dewi, 2017).

Thus, after all, there is no guarantee that the wound after cesarean section will heal optimally without antibiotics. Signs of infection after cesarean section include purulent (pus), increased drainage (the presence of wound fluid), tenderness, redness, and swelling around the wound, increased temperature, and increased leukocytes (Pratiwi, 2013). The risk of infection can be reduced by giving antibiotic prophylaxis. Based on this background, the authors would like to conduct a study evaluating the use of antibiotic prophylaxis in cesarean section patients at the Central Surgery Installation of Pertamina Bintang Amin Hospital of Lampung.

This research objective was to determine the distribution of cesarean section patients characteristics at the Central Surgery Installation of Pertamina Bintang Amin Hospital of Lampung in 2019 - 2020 to determine the accuracy of the use of antibiotic prophylaxisin cesarean section patients in 2019 – 2020 there compared to ASHP Therapeutic Guidelines and knowing the therapeutic outcome of the use of antibiotic prophylaxis based on body temperature values in cesarean section patients at the Central Surgical Installation of Pertamina Bintang Amin Hospital of Lampung in 2019 - 2020.

MATERIALS AND METHOD

This research design was an observational (non-experimental) type of research with retrospective data collection, by tracing the actions taken by health workers in the use of antibiotic prophylaxis in cesarean section patients at the Central Surgery Installation of Bintang Amin Hospital of Lampung in 2019-2020.

The research data was taken from medical records entered at the Central Surgical Installation of Pertamina Bintang Amin Hospital in 2019 - 2020 included patient characteristics data, data on the use of antibiotic prophylaxis in cesarean section patients, and therapeutic outcome data. Management of data from the accuracy of drugs, the right route of drug administration, the right dose, and the time of drug administration from medical record data with ASHP therapeutic guideline.

The data collection technique was done by a simple random sampling technique using Slovin’s formula. Fifty-four samples from 118 populations were obtained during that period.

RESULTS

Based on the overall patient characteristics data shown in Table 1, the total number of patients who underwent cesarean section and used antibiotic prophylaxis at the Central Surgery Installation of Pertamina Bintang Amin Hospital of Lampung in 2019-2020 was 54 patients.

Table 1. Distribution of Age Cesarean Surgery Patients at Central Surgical Installation of RSPBA Lampung in 2019 – 2020

Age	Sample Size	Precentage
< 20 years old	0	0
20 – 34 years old	34	63,0 %
> 35 years old	20	37,0 %
Total	**54**	**100**

Based on Table 1 shows the action cesarean section has an incidence rate of highest in the age group 20-34 years by 63.0%,

Table 2. Distribution of Gestational Age of Cesarean Surgery Patients at the Central Surgical Installation of RSPBA Lampung in 2019 – 2020

Gestational Age	Sample Size	Precentage
(Preterm) 28 – 36 weeks	2	3,8 %
(Aterm) 37 – 42 weeks	52	96,2 %
(Postterm) > 42 weeks	0	0
Total	**54**	**100 %**

Based on Table 2, it shows that cesarean section has the highest incidence in the 37-42 week gestational age group (aterm) of 96,2%.

Table 3. Distribution of the length of care for patients with cesarean section at the Central Surgical Installation of RSPBA Lampung in 2019 – 2020

Length of Stay	Sample Size	Precentage
3 Days	11	20,4 %
4 Days	39	72,2 %
5 Days	4	7,4 %
Total	**54**	**100 %**

Based on table 3 shows that the length of stay after cesarean section is at most 4 days by 72.2%

Table 4. Distribution of Indications for Cesarean Surgery Patients at the Central Surgical Installation of RSPBA Lampung in 2019 – 2020

Indications	Sample Size	Precentage
SC History	24	44,4 %
Breech Presentation	13	24,1 %
With the Transverse Lie	10	18,5 %
Premature rupture of membranes	5	9,2 %
Cephalopelvic Disproportion	2	3,8 %
Total	**54**	**100 %**

Based on table 4 shows that the most indications for cesarean section are in patients with a history of cesarean section 44.4%

The Evaluation ofthe Use of Antibiotic prophylaxis

The use of drugs was appropriate if the patient got the drug according to the clinical needs. The purpose of antibiotic prophylaxis is to reduce morbidity and mortality caused by surgical wound infection (ILO) by selecting the suitable antibiotic prophylaxis, the correct dose, the proper route of administration, and the right time of administration. The cesarean section required the use of antibiotic prophylaxis because this surgery carried a high risk of infection.

Right Medicine

Table 5. Results of Drug Accuracy for Cesarean Surgery Patients at the Central Surgical Installation of RSPBA Lampung in 2019 – 2020

Type Prophylaxis Antibiotics	ASHP Therapeutic Guidline.	Sample Size	Precentage
Ceftriaxone	Cefazolin Klindamisin Aminoglikosida	44	81,5 %
Cefazolin		10	18,5 %
Total		**54**	**100 %**

Based on table 5, as many as 81,5% of patients received ceftriaxone antibiotics as prophylaxis in cesarean section.

Right Route of Drug Administration

Table 6. The results of the accuracy of the route of administration of drugs to patients with cesarean section at the Central Surgical Installation of RSPBA Lampung in 2019–2020

Prophylaxis Antibiotics	Administration Route	ASHP Therapeutic Guidline	Sample Size	Precentage
Ceftriaxone	Iv	Iv	44	81,5 %
Cefazolin	Iv	Iv	10	18,5 %
Total			**54**	**100 %**

Based on table 6, prophylactic antibiotics for cesarean section at RSPBA are given routinely intravenously both ceftriaxone and cefazolin

Table 7. Results of Dosage for Cesarean Surgery Patients at the Central Surgical Installation of RSPBA Lampung in 2019 – 2020

Prophylaxis Antibiotics	Dosage	ASHP Therapeutic Guidline	Sample Size	Precentage
Ceftriaxone	1 g	Cefazolin 1 – 2 g	44	81,5 %
Cefazolin	1 g		6	11,1 %
	2 g		4	7,4 %
Total			**54**	**100 %**

Based on table 7 shows that the dose most given is ceftriaxone 1 gram at 81.5%

Table 8. Results of Timeliness of Drug Administration for Cesarean Surgery Patients at the Central Surgical Installation of RSPBA Lampung in 2019–2020

Prophylaxis Antibiotics	Giving Time	ASHP Therapeutic Guidline	Sample Size	Precentage
Ceftriaxone	Before surgical incision	Before incision surgey or after rope clamp center	44	81,5 %
Cefazolin	Before surgical incision	Before incision surgey or after rope clamp center	10	18,5 %
Total			**54**	**100 %**

Based on table 8, prophylactic antibiotics for cesarean section in RSPBA were given before surgical incision either ceftriaxone or cefazolin.

Table 9. Temperature in Patients with Cesarean Surgery after Cesarean Surgery at the Central Surgical Installation of RSPBA Lampung in 2019 – 2020

Prophylaxis Antibiotics	Body Temperature (°C)	Simple Size	Precentage
Ceftriaxone	36,0 - 37,0	44	81,5 %
Cefazolin	36,0 – 37,0	10	18.5 %
Total		**54**	**100 %**

Based on table 9 shows that body temperature after cesarean section using either ceftriaxone or cefazolin is 36,0-37,0 °C.

DISCUSSION

The majority of patients were 20-34 years old, which was the ideal age range for a woman to experience the pregnancy and giving birth processes (Indiarti, 2015) this too suggested by other studies that also found something similar (Karminingtyas et al., 2018). Women under 20 years old were more at risk because the uterus and pelvis had not developed properly. On the other hand, in pregnant women > 35 years, the function of their reproductive organs had decreased.

In addition to being too old, they had complications of the disease which made them impossible to give birth normally. Women less than 20 years old and more than 35 years old had an increased risk of complications in pregnancy. One of them was the placenta solution.

The distribution of patients based on gestational age was divided into three categories, namely term, pre-term, and post-term gestational age. Term age is anormal gestational age. Pre-term age, or often called premature, is caused by several factors, including pregnant women, fetal factors, or other factors such as socioeconomic.

Meanwhile, post-term gestational age affected the development until the death of the fetus. Furthermore, post-term gestational age had a higher risk than term gestational age, especially for perinatal mortality related to meconium aspiration and asphyxia (Rachimhadhi et al., 2010). Patients length of stay in the hospital could assume that the patient received treatment according to the indications, resulting in optimal therapeutic effectiveness (Prasetya, 2013).

The percentage of the length of stay (LOS) of treatment was for 3-5 days. There were 11 patients in three days (20.4%), 39 patients in four days (72.2%), and four patients in fivedays (7.4%). Those ranges indicated that the length of stay for cesarean section patients had met the parameters set in the average length of stay (AvLOS) in a maximum of six until nine days (The Ministry of Health of the Republic of Indonesia, 2011).

The length of hospitalization due to nosocomial infection conditions, surgical wound healing, patient's non-medical condition, and wound healing factors could bring significant effects on the length of stay of surgical patients with the use of appropriate antibiotic prophylaxis (Elly & Asmawati, 2016). In general, cesarean section patients at Pertamina Hospital Bintang Amin of Lampung in 2019 – 2020 had a good efficiency of the length of stay because the LOS value did not exceed the maximum AvLOS value.

Furthermore, cesarean section delivery was quite variable. A patient might have one or more indications. Cesarean section was performed when normal delivery was not possible. In addition, a cesarean section can be performed even though there are no medical indications or a risky medical diagnosis such as a cesarean delivery at the patient's request (Ayuningtyas et al.,2018).

Cesarean section was recommended for patients who had specific indications. Medical indications were detected. According to the American Pregnancy Association, several factors caused patients who previously underwent a cesarean section to return to do so in their second pregnancy. Others still experienced the same health problems that caused them to undergo a cesarean section before.

The incisions on the uterine wall in the previous cesarean section were vertical. The delivery interval was only <18 months or 24 months apart from the previous cesarean delivery, several risk factors from the patient and obesity, short stature, age when pregnancy was > 35 years, and several other risk factors (Tampai, 2020). The antibiotic ceftriaxone was a third-generation cephalosporin, and cefazolin was a first-generation cephalosporin.

Based on the research results, it showed that the accuracy of drug administration for cesarean section cases at Pertamina Bintang Amin Hospital in 2019 - 2020 was stated to be appropriate for drug administration based on ASHP Therapeutic Guidelines with a percentage of 18.5%. First-generation cephalosporin antibiotics, such as cefazolin, were recommended as antibiotic prophylaxis rather than later generations because they had a high rate of killing gram-positive bacteria that caused infection in the cesarean section and had a high penetration ability into larger tissues (Bratzler et al., 2013).

It followed the ASHP Therapeutic Guidelines, which state that the recommended antibiotic prophylaxis in the cesarean section was cefazolin, with alternative therapy of clindamycin or aminoglycoside if allergic to beta-lactam antibiotics. In some research results, therapeutic cesarean section using prophylactic antibiotics. The third generation cephalosporins are ceftriaxone (Dayana et al, 2017). Therefore, It is very important to choose prophylactic antibiotics appropriate for therapy guidelines.

From Table 5, it can also be seen that there was no use of combination antibiotic prophylaxis. The administration of a single antibiotic has reached the therapeutic effect and could inhibit bacteria that would cause infection if the operation was carried out for four hours or less (Husnawati & Wandasari, 2016). Antibiotic prophylaxis was generally given intravenously, proven to be reliable and effective against surgical wound infections in all types of surgery, and could estimate serum levels and concentrations. Dosage in the use of antibiotic prophylaxis should be adjusted according to the indications found.

The dose of antibiotic prophylaxis should not be too small because it could cause a therapeutic effect below the minimum inhibitory level; therefore, it did not produce a therapeutic effect (Ganiswara, 2017). The therapeutic outcome of giving antibiotic prophylaxis at Pertamina Bintang Amin Hospital could be seen from the clinical parameters in body temperature. These parameters were closely related to the symptoms when the patient had a surgical wound infection.

It could be seen examining clinical data in body temperature, which had increased above normal values if there was inflammation. Causes infection such as bacteria or viruses could stimulate the body's immune response so that patients could experience an increase in body temperature or fever as an early sign of infection (Ganiswara, 2017). Based on the results obtained in the evaluation of the use of antibiotic prophylaxis at Pertamina Bintang Amin Hospital of Lampung in 2019 - 2020, it was found that a normal body temperature indicated the patient's condition when he returned home was in a recovered state.

CONCLUSION

The distribution of characteristics of cesarean section patients at Pertamina Bintang Amin Hospital of Lampung showed that based on 54 patients observed in this research, the most occurred was at the age of 20-34 years (63.0%). The gestational age was about 37-42 weeks (96.2%), then the length of stay was four days (72.2%), and there were five indications in patients with cesarean section and the highest in the case of patients who had cesarean section history.

The use of antibiotics compared to the ASHP Therapeutic Guideline included 18.5% correct drug, 100% correct dose, 100% correct route of administration, and 100% timely administration. The therapeutic outcomeof antibiotic prophylaxis at Pertamina Bintang Amin Hospital was seen based on body temperature and the results of the patient's condition when patient returned home in a recovered state indicated by a normal body temperature.

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