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Surveillance for Risk Factors of Surgical Site Infection after Cesarean Section, A Hospital Setting in Lasinrang Indonesia: A Prospective Cohort Study

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ABSTRACT

Infection is the most common cause of mortality and morbidity in pregnant women during cesarean section. Hence this study was undertaken to study surveillance of SSI after cesarean section at surveillance risk factors for Surgical Site Infection (SSI) after cesarean section. The purpose of this research was to know the ASA score, obesity, duration of operation, type of surgery, wound classification, and prophylaxis are the risk factors surgical site infections. This type of research is the observational research by using a prospective cohort study design. Total sample that would be analysis in this study was 88 samples. The data were processed using univariate, bivariate and multivariate analysis. The results showed that ASA score exponent (B) (estimate odds ratio) ASA score 23 and wound classification 7.667 collectively to wound condition of patient's operation with cesarean section with p-value = 0.005. ASA scores have the greatest risk of incidence of cesarean section wound infection.

Keywords: Surveillance, Cesarean section, Infection, Surgical site, Indonesia

INTRODUCTION

A surgical site infection is defined as an infection which occurs at the incision/operative site (including drains) within 30 days after surgical procedure if no implant is left in place/ within one year if an implant is left in place. The infection must appear related to the surgical procedure. According to CDC's National Nosocomial Infection Surveillance system 38% of all nosocomial infections in surgical patients are SSI. Cesarean section falls in clean-contaminated wounds category. SSI is the second most common infectious complication following cesarean section after UTI. It's incidence ranges from 3-15%. It delays the recovery, prolongs hospitalization, necessitate readmission, adds to hospital bills and other morbidities as well as mortalities.⁽¹⁾ Surveillance is conducted with the aim of obtaining baseline infectious hospital data, lowering hospital infectiousness rate, identifying premature incidents of hospital infection, convincing health professionals about the problems that require mitigation, measuring and assessing the success of a infection prevention and control program in the hospital. One type of Hospital Infection is an infectious surgical wound which is an infection of the surgical wound inflicted by an invasive procedure. This infection is obtained maximal 30 days after surgery without tool installation, surgical wound infection can be found in closed and open wounds.⁽²⁾

Wound infection is an infection that occurs at the location of the incision or organ that occurs within 30 days after surgery if not using implants or within 1 year if there is an implant.⁽³⁾ Incidence Wound infections in hospital surgery is very high, can be found in all types of surgery including in cesarean section surgery. Studies in South Western Uganda show that overall cesarean section surgery incidence is very high at 16.4%, 5.9% superficial and 47.1% inner tissues and organs.⁽⁴⁾ Several studies of the incidence of wound infections in cesarean section surgery occurred in Tanzania in 2012 of 10.9% in Nepal in 2014 at 12.8%.⁽⁵⁾ Prevalence is low in Thailand-Myanmar (5.9%) while infections wound caesarean section in Rwanda in 2016 (4.9%).⁽⁶⁾

The prevalence of surgical wound infections at Cipto Mangunkusumo Hospital (Indonesia) for three years (7.2%), is still high from the standard set by the health ministry of 1.5%.⁽⁷⁾ The prevalence of special cesarean section surgery infection at Riau 2014 Arifin Achmad Hospital 3.47% is quite tolerable from the standard set in Indonesia that is 1.5%.⁽⁸⁾ Data on prevention of infection control of Lasinrang Pinrang General Hospital year 2015 (rate 6.7%) and year 2016 increase 8%, is infection that happened due to cesarean section operation seen from its incidence rate this matter including outbreak.

METHODS

This study was conducted on June 1st to 30th September, 2017. Was observational study by cohort prospective study. Population and samples of study were all patients with surgical site infections (88 people).

Sample selected by purposive sampling technique. Data were obtained through interview to respondents by using questionnaire and direct interview. Data were then analysis by using contingency coefficient to independent variables (ASA score, obesity, duration of surgery, type of surgery, wound classification, and prophylaxis) and dependent variable (surgical site infections) and multiple logistic regression.

RESULTS

Selection of the variables used multivariate analysis by using multiple logistic regression method Backward Likelihood Ratio. The results of data processing. Candidate variables were shown in the following table.

Table 1. Relation between independent and dependent variables

Variable	SSI Status				P (0.005)	OR	CI 95 %	
	SSI		Non SSI				Lower	Upper
	f	%	f	%				
ASA score								
• ≥ 3	5	33.3	1	1.4	0.000	36	3.807	340.402
• ≤ 2	10	66.7	72	96.6				
Obesity								
• obesity	8	53.3	26	35.6	0.16	2.06	0.763	6.343
• non obesity	7	46.7	47	64.4				
Type of surgery								
• Emergency	12	80.0	57	78.1	0.588	1.12	0.282	4.469
• Elective	3	20.0	16	21.9				
Duration of surgery								
• ≥ 60 times	5	33.3	0	0	0.000	8.3	4.461	14.843
• < 60 times	10	66.7	73	100				
Wound classification								
• Class ≥ 3	5	33.3	3	4.1	0.003	11.66	2.410	56.487
• Class ≤ 2	10	66.7	70	95.9				
Prophylaxis								
• > 1 hour	5	33.3	18	24.7	0.344	1.5288	0.461	5.063
• ≤ 1 hour	10	66.7	55	75.3				

Table 2. Result of the multivariate candidate selection

Variabel	B	S.E	Wald	Df	Sig.	Exp (B)
Duration of surgery	-21.846	15012.8	0.00	1	0.999	0.000
ASA score	3.135	1.297	5.848	1	0.016	23.000
Classification of operations	2.037	1.007	4.090	1	0.043	7.667
Constan	36.077	30025.67	0,000	1	0.999	4.654

DISCUSSION

The ASA risk factor score ≥ 3 became the largest risk factor for wound infection. This is in line with research conducted at the Regional Hospital in India, the results of a study at Portland University which explains that ASA factors score 3 or more to be a greater risk factor (12.8 times) surgical wound infections than patients with ASA scores 1 and 2 ahead of operation.^{(9),(10)} The calcification grade ≥ 3 can be a risk factor for surgical wound infection of 11, 66 times. This is in line with previous studies that mothers who gave birth to caesarean section surgery who had contaminated wounds and gross injuries gave the opportunity of surgical wound infections 9, 61 times compared with clean or contaminated wounds or class 3 is likely to be a risk factor for surgical wound infections statistically.⁽¹¹⁾

The classification type was found to be a risk factor for cesarean section surgical intervention in studies in Thailand. The results of the study suggest that the wound grade of 3 or 4 is about 7%, patients with wound cesarean section 3 and 4 have undergone repeated internal examination and rupture of membranes and manipulation of the amniotic cavity so that contamination has occurred before the incision.⁽¹²⁾ The type of surgery, duration of surgery, obesity and antimicrobial prophylaxis were not significant risk factors, although contrary to previous studies suggesting that surgery, duration of operation and obesity may be a risk factor for surgical wound infections in postoperative patients as well as in post-cesarean section patients. The condition is caused due to excess fat in the body of the stomach primarily inhibit vascularization in the area of surgical wound. Decreased vascularization conditions inhibit nutritional intake in the inhibited wound area leading to susceptibility to wound infection. Obesity is not a significant factor in the occurrence of surgical wound infections, although it is known that a

vascularization in adipose tissues plus mechanical trauma to these tissues can cause surgical wound infections.⁵ The same study found also in Brazil risk factors for obesity do not become a risk factor at all for the occurrence of wound infection surgery Cesarean Section.⁽¹³⁾

The planned operation is carried out through the preparation of the patient from the patient's bathing, shaving and physical and mental permeation so that the risk of infection is prevented, but the type of emergency surgery is sometimes carried out because the surgery must be done immediately because it threatens the mother and fetus so that surgical wound infections can occur. Another study explains that this type of surgery is not a risk factor for the occurrence of surgical wound infections. The same study also found that this type of elective and planned surgery is not a risk factor for wound infections although some references say emergency surgery may be a risk factor for wound infections.^{(13),(14)} The length of surgery is not a risk factor because the research site is not an educational hospital because one of the causes of long surgery occurs is made it as a field of study for resident doctors as this is disclosed in previous research in the United States one reason for the extension of the operation is intra teaching operative so that the operation takes longer than the time already set.⁽¹⁵⁾

The inadequacy or inappropriateness of these prophylactic antibiotics can be a strong predictor of wound infection. Administration of antibiotics should be given 120 minutes before incision. Cesarean section surgery is particularly susceptible to infection from vaginal labor due to an incision or to premature rupture of the membranes, so it is deemed necessary to administer antibiotics for prevention prior to surgery. Provision of antibiotics as prevention is more effective than giving as therapeutic. Provision of prophylactic antibiotics while still being debated but proven to reduce postoperative wound infection surgery cesarean section up to 50%, high risk of infection for pregnant women who undergo cesarean section surgery than the normal birth so that prophylactic antibiotics remain the best choice in reducing the incidence of infection surgery.⁽¹⁶⁾

CONCLUSION

ASA scores have the greatest risk of incidence of cesarean section wound infection. The recommendation is the implementation of wound infection surveillance that is to reduce the incidence of wound infection with the discovery of risk factors earlier and carry out prevention and monitoring Antenatal care regularly.

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