



## **Parity: is A Risk Factors For Surgical Site Infection In Patient With Caesarean Section?**

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### **ABSTRACT**

*The surgical site infection is one of the effect nosocomial infection in Indonesia.. Surgical site infection post-cesarean section may increase mortality and morbidity, length of stay and cost of hospitalization. Surgical site infection may decrease risk factors especially risk factors for surgical site infection post cesarean. The prevalence of surgical site infection in Indonesia was 2-18%. The case of surgical site infection post cesarean section was 15%. To determine parity related to surgical site infection post-cesarean section in Pekalongan hospital. This study was an observational analytical study. Retrospectif case control design was used in this study with quantitative approach. The primary data of this study were the medical records. The subject was all of the women having been through cesarean section in Pekalongan hospital. The diagnosis of surgical site infection was defined according to the criteria of the Centers for Disease Control and Prevention (CDC). The observation resulted in 255 multipara patients and 367 primipara patients. The bivariat analysis used independent T-test and Chi-square. The result of bivariat analysis showed that parity significantly supporting surgical site infection were parity [OR=1,78 (1,29-2,46)], p=0,001, premature rupture of membrane (PROM) [OR=1,65 (1,14-2,40)], p=0,011 and age which criteria <20 and >35 years [OR=0,62 (0,43-0,89)]. The samples studied through the medical records of patients. In Pekalongan hospital experienced cesarean section with several risk factors have not been well documented. Detection of unknown incidence of infection when patients back control documented in the medical record outpatients. Parity was the risk factors related to the surgical site infection incidence. For the prevention of such risk should the patients admission to a variety of risks and there are plans to do cesarean, patient records must be well documented. Good system in the management of patients with cesarean section such special treatment and special treatment and special forms of documents that could reduce the risk of infections such as document specific nursing care of patients with cesarean section, as well as a variety of nursing actions performed to the patients must be in accordance with the standards.*

**Keywords:** parity, surgical site infection, cesarean section.

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### **INTRODUCTION**

Surgical site infection is a wound caused by invasive section procedure. Surgical site infections can cause disability and death. The incidence of surgical site infections in British hospitals in 2006 amounted to 13.8%. Infection is the second cause of maternal death after bleeding of 15% (IDHS, 2007). Infections of the surgical wound that can be mother one of them through a cesarean section [1].

The percentage of cesarean section is about 10-15% annually from all births in developing countries [2]. The National Institute for Health and Clinical Excellence, shows that surgical procedures in the UK cause infections of 5% [3].

Many women are anxious about the pain in the face of normal labor, so many choose to perform a cesarean section even without any indication on a more practical basis. In Indonesia alone, the percentage of cesarean section is about 5%. In government hospitals an average of 11%, while in private hospitals can be more than 30% [4].

Surgical site infection in Indonesia (SSI) is one of the most common nosocomial infections and it is difficult to know the exact cause. From the results of previous studies the incidence of surgical site infections in Indonesia varies between 2-18% of the overall surgical procedure. Surgical site infection can

not be reduced to 0%. One way to reduce the incidence of SSI is to reduce the factors that may increase the risk of wound infection [5].

Factors that cause birth incidence with cesarean section based on indication of maternal pregnancy is old labor as much as 38 (41,77%) incidence. Another cause of the incidence of labor with cesarean section is an indication due to family planning failure of 3 (60%) incidence<sup>4</sup>.

The most dominant factor affecting wound healing post cesarean section surgery is personal hygiene then followed by nutritional status and the latter DM disease. Meanwhile, there are two factors that play an important role in influencing the incidence of wound infection surgery, namely 1) Endogen factor is a factor that exist in the patient itself such as age, sex, disease predisposisi ILO, and previous operations. 2) Exogenous factors are factors outside the patient, such as the length of the patient being hospitalized, the level of wound cleanliness, the regularity of antibiotic use, the duration of antibiotic after cesarean section, duration of operation, and number of personnel in operating room<sup>6</sup>.

## MATERIAL AND METHODS

This research is an observational analytic research with case control design. This study was conducted to determine the relationship between parity with the incidence of postoperative wound infection cesarean section.

This research was conducted at Pekalongan hospital by seeing medical record of patient caesarean section up to 30 days by using data collection tool in the form of checklist.

The sample size in this study was calculated on each risk factor based on the sample formula for the hypothesis test of two proportions [7]. Sampling in the study using simple random sampling, in accordance with inclusion criteria i.e. patients with caesarean sections and patient records complete records. The number of samples in this study were 311 patients in the case group and 311 patients in the control group.

Data analysis was done by three stages, namely: describing the distribution of independent variables parity with dependent variable (surgical site infection post caesarean section). Seeing the significance and magnitude of the independent variable relationship to the dependent variable with chi square test to measure the risk factors increase the incidence of postoperative cesarean section wound infection between all independent variables with dependent variable.

## RESULTS

In table 1. below, it is found that from 3 variable of respondent characteristic there are 2 variable which is not homogeneous that is age and parity, with value  $p < 0,05$ . While the homogeneous variable is shaving with  $p > 0,05$ . The researchers received a sample of 311 for the case group and 311 for the control group who had met the inclusion criteria. This study was conducted for approximately 6 months.

Table 1. Characteristics of patients undergoing cesarean section at Pekalongan Hospital (n = 622)

Variable	Case	Control	p
	(n=311)	(n=311)	
Age (year) (mean ± SD)	29,15±5,70	30,61±6,42	0,003
Parity (%)			
Multipara	149 (47,9%)	106 (34,1%)	0,001
Primipara	162 (52,1%)	205 (65,9%)	
Shaving (%)			
Shaved	136 (43,7%)	129 (41,5%)	0,627
Unshaved	175 (56,3%)	182 (58,5%)	

Description: continuous variables are displayed with mean (average), standard deviation and dichotomous data displayed by number and percentage; p = p value

In table 2. above the results obtained patients with surgical site infections 311 (19%). The most common wound infection criteria experienced by post-cesarean patients in Pekalongan hospital was wet as many as 186 patients (59.8%).

Other SSI criteria were swollen as many as 64 patients (20.6%), purulent as many as 35 patients (11.2%), dehisiensi as many as 10 patients (3.2%), redness of 9 patients (2.8%) and fever as many as 7 patients (2.4%).

Table 2. Distribution of the characteristics of postoperative cesarean section surgery incidence in Pekalongan hospital (n = 311)

Distribution of the characteristics of Surgical Site Infection	n (%)
<b>Incidents</b>	
Surgical Site Infection	311 (19)
No Surgical Site Infection	311 (19)
<b>Criteria</b>	
Swollen	64 (20,6)
Dehisiensi	10 (3,2)
Purulent	35 (11,2)
Wet	186 (59,8)
Fever	7 (2,4)
Redness	9 (2,8)

The result of bivariate analysis in table 3. above is from 4 variables there are 3 variables that have statistically and clinical correlation with incidence of surgical site infection post cesarean section ( $p < 0,05$ ). The age variable is a protective factor with OR = 0.62; 95% CI 0.43-0.89.

The most statistically and clinically significant variables with incidence of postoperative cesarean section site infections were parity with OR = 1.78; 95% CI 1.07-4.42 and p value = 0.001. Patients in the multiparous group as a whole were 255 patients (81.9%), who had surgical wound infection of 149 patients (47.9%). The results of this analysis show that clinically multiparous is a risk factor for site infections compared to primiparas.

Table 3. Relationship between parity and incidence of postoperative cesarean section wound infection in Pekalongan hospital (n = 622)

Variable	Case (n=311)		Control (n=311)		p	OR
	n	%	n	%		
<b>Age</b>						
<20 dan >35 year	61	19,6	88	28,3	0,015	0,62
20-35 year	250	80,4	223	71,7		(0,43-0,89)
<b>Parity</b>						
Multipara	149	47,9	106	34,1	0,001	1,78
Primipara	162	52,1	205	65,9		(1,29-2,46)
<b>PROM (premature rupture of membrane)</b>						
Yes	88	28,3	60	19,3	0,011	1,65
No	223	71,7	251	80,7		(1,14-2,40)
<b>Low Placenta</b>						
Yes	5	1,6	3	1,0	0,722	1,68
No	306	98,4	308	99,0		(0,39-7,08)

## DISCUSSION

The results of this study indicate that the incidence of cesarean section wound infection in Pekalongan hospital is very high that is 311 patients or about 19% of 1,592 of the samples researched through patient medical record data. Parity is a risk factor with the incidence of surgical site infections with OR = 1.78; 95% CI 1.07-4.42 and p value = 0.001.

The average cesarean section patient in Pekalongan hospital is mother with multipara or mother with child birth more than one. The number of multiparous patients with age > 35 years was 62 (41.6%) and those with SSI were 42 (67.7%) patients. While the number of patients primipara with age > 35 years as many as 45 (30.2%) with the SSI experienced as many as 21 (46.7%) patients. In multiparous patients it is more susceptible to infection after surgery compared with primiparous patients. In multiparas despite having a lot of experience and knowledge especially those who have already had cesarean section surgery, but the birth distance of the child and age also affects the SSI incidence caused by the weakening of the natural host defenses.

The results of this study are similar to those of Gordon *et al.* (2013) which shows the result that the age factor is very influential in pregnant women and childbirth, especially in multiparous mother. In pregnancy the first child is also more susceptible to infection, especially in mothers with age more than

40 years<sup>8</sup>. Different results were performed by Riyami *et al.* (2013) who mentioned that patients with an average pregnancy of more than one (multiparous) had most cesarean section surgery of about 12 (27%). While patients who experienced post-cesarean infection incidence more common in women who first gave birth but aged 30 years and over as many as 20 patients (45%) [13].

Nurses or midwives can prevent the incidence of SSI post-Cesarean section by providing education about the risk factors associated with SSI surgery. Nurses or midwives can teach patients to practice simple aseptic techniques such as hand washing either in the operating room or in the inpatient room. In addition, nutrition education can also be given to post-cesarean section patients before going home to accelerate the healing process of former cesarean section surgery.

In Pekalongan hospital experiencing cesarean section operation with some risk factors have not been well documented. Detection of SSI events is known when the patient performs documented re-control in the patient's outpatient medical record. For the prevention of the risk should be when the patient comes in with various risk factors and there is a plan for cesarean section, the patient record should be well documented.

The high incidence of cesarean section infection in Pekalongan Hospital is possible due to the ineffectiveness of the Committee on Prevention and Infection Control, the lack of good surveillance activities, and the limited personnel or special staff responsible for preventing and handling nosocomial infections, especially wound infections operation.

The results of this study are similar to those of British hospitals conducted by Wloch *et al.* (2012) with a result of 4,107 patients studied there were 394 obese patients with BMI (body mass index) > 35 kg / m<sup>2</sup>, detected SSI or about 9.6% [9]. The results of this study are similar to the World Health Organization (WHO) survey which says that the incidence of SSI is 5% -34% [2].

The incidence of nosocomial infections is part of the nurse's responsibility in providing care. The incidence of nosocomial infections greatly affects the quality of health services. The standard of nursing care is a desirable quality statement and can assess the provision of nursing care to the client of pregnant women. To ensure the effectiveness of nursing care on the client, there should be criteria in the practice area that direct nursing in making decisions and safely performing nursing interventions. The existence of nursing care standards is possible to provide clarity and guidance to identify the final size and assessment. Nursing care standards can improve and facilitate the improvement and achievement of quality standards-based quality nursing care and may also reduce the incidence of nosocomial infections[11].

Nosocomial infections have a broad impact, ranging from patients, families and communities to health care facilities. For patients the case of infection can cause disability and even death. So patients need additional checks, treatments and treatments that should not be necessary. For families and communities, nosocomial infections require high costs, increased hospital days that will lower the level of work productivity. For health care facilities, nosocomial infections give a bad image and influence the quality of service indicators. And can have legal impacts in the form of claims that cause material harm or non-material, both patients and health care facilities [12].

Infection prevention and control in hospitals is a shared responsibility, the responsibility of all existing units / installations of patients admitted to the hospital until the time the patient is discharged from the hospital should be protected from possible nosocomial infections. If the committee can work well, then the incidence of nosocomial infection can be known quickly so that it can be prevented and controlled immediately. The data collected can also help control infection control practices as well as produce policies to reduce the number of surgical wound infections, especially postoperative cesarean section surgery infections.

Good systems in the management of patients with cesarean section such as special treatment and special form of document may reduce the risk of surgical site infections, such as special nursing care documents for patients with cesarean section surgery, and various nursing actions performed on the patient must be in accordance with operational standards procedure. If the patient has signs and symptoms at the hospital or when the patient is in control, the nurse may trace them using a special checklist to the patient with cesarean section surgery and immediately reported to the IPC team (infection prevention and control) for follow-up and surveillance.

## CONCLUSION

Parity has a significant association with the incidence of postoperative cesarean section wound infection. There are several actions that can be done by Pekalongan hospital among them are: Disseminate about wound surgery patient and health worker involved especially nurse so have same perception about surgical site infection. The infection prevention and control team actively conducts surveillance and establishes and implements fixed procedures for prevention of nosocomial infections. Creating a

complete nursing care document in the obstetric room on risk factors for wound infection in patients with cesarean section. Make a policy for microbiological examination before surgery to be appropriate in the use of antibiotics. Perform discharge planning by providing education about nutrition to decrease to help wound healing process in patients with anemia to prevent infection at home. Further studies were conducted using prospective methods to look at other risk factors particularly related to nursing factors.

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