ORIGINAL ARTICLE:

Causes of post-caesarean surgical site infection at South Konawe Hospital, Southeast Sulawesi, Indonesia, February - July 2017

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ABSTRACT

Objectives: To analyze the causes of post-caesarean section surgical site infection (SSI) at South Konawe Hospital, Southeast Sulawesi, Indonesia, between February and July 2017.
Materials and Methods: Retrospective study using descriptive method with cross-sectional design from February to July 2017 in inpatient and outpatient wards at Obstetrics and Gynecology Outpatient Clinic, South Konawe Hospital. The population was the patients' medical records.
Results: There were nine cases (7.75%) from totally of 116 cases of caesarean section with SSI. Based on SSI type, there were four cases (44.4%) with superficial SSI and 5 cases (55.5%) with deeper classification of SSI. SSI was dominated by women of productive age with age 20-35 years in 66.6% case. The lowest BMI was 22 kg/m2 and the highest BMI was 41.5 kg/m2. Hemoglobin levels were higher than 11 g/dL (66.6%). The most surgical action to be performed was emergency operation in 8 cases (15.09%).
Conclusion: Causal characteristics of SSI at South Konawe were age of 20-35 years, the lowest BMI of 22 kg/m2 and the highest BMI 41.5 kg/m2, hemoglobin levels higher than 11 g/dL, and the need of emergency operation.

Keyword: SSI; CS; South Konawe Hospital

ABSTRAK

Tujuan: Menganalisis penyebab kejadian infeksi daerah operasi (IDO) pasca operasi sesarean di RS Konawe Selatan, Sulawesi Tenggara, Indonesia, periode Februari – Juli 2017.
Bahan dan Metode: Penelitian secara retrospektif dengan metode deskriptif dengan rancang bangun cross sectional selama bulan Februari-Juli 2017 di ruang rawat inap dan rawat jalan di Poli Hamil dan Kandungan, RS Konawe Selatan, dengan populasi data rekam medis pasien.
Hasil: Sebanyak 9 kasus (7,75%) dari total 116 kasus persalinan yang dilahirkan secara seksio sesarea mengalami IDO, dengan klasifikasi IDO 4 kasus (44,4%) IDO superfisial dan 5 kasus (55,5%) IDO dalam. IDO didominasi oleh perempuan usia produktif dengan usia terbanyak 20-35 tahun sebanyak 66,6% kasus. BMI terendah adalah 22 kg/m2 dan BMI tertinggi 41,5 kg/m2. Kadar hemoglobin lebih dari 11 g/dL terbanyak (66,6%). Tindakan operasi terbanyak yang dikerjakan adalah operasi darurat 8 kasus (15,09%).
Simpulan: Karakteristik penyebab IDO di RS Konawe Selatan antara lain dari segi usia terbanyak usia 20-35 tahun, BMI terendah 22 kg/m2 dan BMI tertinggi 41,5 kg/m2, kadar hemoglobin lebih dari 11 g/dL dan tindakan operasi yang dikerjakan secara darurat.

Kata Kunci: IDO; operasi sesarea; RS Konawe Selatan

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INTRODUCTION

Infection that occurs in wounds due to surgical procedures is called Surgical Site Infection (SSI). Based on the National Institute for Health and Care Excellence (NICE) Guidelines, 16% of Healthcare Associated Infection (HCAI) is caused by SSI, which, if not immediately treated, can become a serious problem. SSI in the United States is a complication of surgical procedures that often occur in hospitals, with an incidence of 2-5% and the number of patients around 160,000-300,000 every year.[1]

Caesarean section is a surgical procedure with SSI as the main complication associated with maternal mortality and morbidity. Approximately 50% of cases of maternal death are related to surgical procedures and 16% are associated with SSI. Based on the criteria of the Centers for Disease Control and Prevention (CDC), SSI can be classified into superficial incisions, deep incisions and organs/cavities. CDC recommendations state that SSI is established from surgery until the patients' discharge from the hospital for 30 days without implantation.[2]

The Konawe Selatan Hospital is a regional hospital in South Konawe Regency, Southeast Sulawesi Province. One of the services carried out by this hospital is mother and child health services, with the number of deliveries as many as 271 cases in the period from February to July 2017. Of the total deliveries, vaginal delivery was 155 and 116 cases of abdominal delivery. Post-cesarean surgery SSI cases were 9 (7.75%) out of a total of 116 abdominal delivery cases. Patients who had been discharged and visited the Outpatient Clinic again had never been recorded or reported. This case was incompatible with the data from Europe and the United States where SSI rates were 2–5%.[3] This study tried identified the causes of SSI in post-cesarean surgery patients in Konawe Selatan Hospital.

MATERIALS AND METHODS

This study was a retrospective activity analysis with descriptive method using cross-sectional design. This study observed the cases from February to July 2017 at the Inpatient and Outpatient Pregnancy and Gynecology Clinic, Konawe Selatan Hospital. The population in this study was the medical record data of the patients treated in the Inpatient Pregnancy and Gynecology Clinic, Konawe Selatan Hospital. The sample in this study were patients who received treatment in Inpatient and Outpatient Pregnancy and Gynecology Clinic, South Konawe Hospital.

The inclusion criteria in this study were all postoperative cesarean patients diagnosed with SSI, while the exclusion criteria were incomplete patients' medical records. The research data were recorded in the data retrieval form. Data analysis was performed using SPSS (Software Package for social Science) software.

RESULTS AND DISCUSSION

Clinical Aspects

From February to July 2017 in Konawe Selatan Hospital there were 271 delivery cases. One hundred and forty-three cases (52.7%) of which were normal delivery. Labor with vacuum extraction were 8 cases (2.95%), breech delivery were 4 cases (1.47%), and delivery with cesarean surgery were as many as 116 case (42.8%). Most deliveries were in April and May with 63 and 61 cases, respectively. From February to July 2017, out of 9 SSI cases in Konawe Selatan Hospital, the age of patients who underwent surgery with age <20 years was only one (16.7%), ages 20-35 years were 6 (66.6%) cases and age >35 years as many as 2 (33.3%) cases (Figure 1).

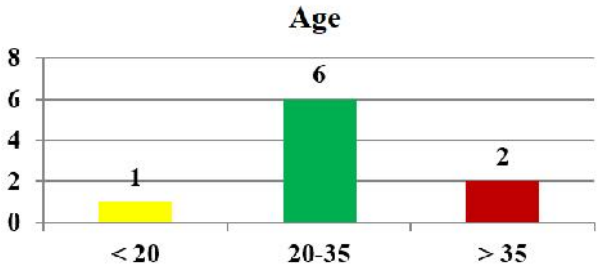

Figure 1. Patients' characteristics by age

Age of having SSI in those aged <20 years was at 17 years (1 case), in age range 20-35 years at 23 years (3 cases), age 25 years in 1 case, age 32 years 1 case and 34 years also 1 case. Age range of >35 years were found in 2 cases, which was at the age of 36 and 37 years.

Based on the data from Konawe Selatan Hospital, the lowest BMI was 22 kg/m2 and the highest was 41.5 kg/m2 with the following detail: 7 (77.7%) cases with normal BMI, 1 (11.1%) case with obesity class II, and 1 (11.1%) cases with obesity class III (Figure 2).

Obesity is an important risk factor in SSI incidence, especially in malignant surgery. Obese patients have a higher incidence of SSI when compared to patients with normal or overweight BMI.[4] The data are in accordance with the results of the study, which found two cases with obesity (class II and III) who experienced SSI.

Mechanical stress on wounds and penetration of prophylactic antibiotics in obese patients with a BMI of more than 30 will be more difficult because relatively avascular fat tissue will indirectly inhibit wound healing.[5]

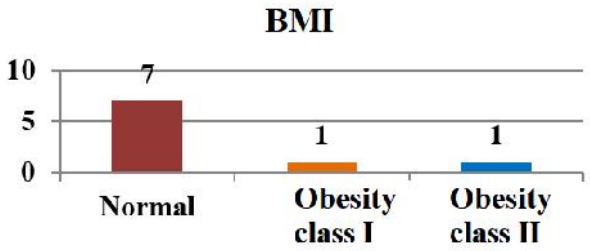

Figure 2. Characteristics according to body mass index

Regarding blood hemoglobin levels, from a total of 9 patients with SSI, 3 (33.3%) cases had Hb levels of less than 11 g/dL, and 6 (66.6%) cases with Hb levels of more than 11 g/dL (Figure 3) The lowest Hb level at the time of surgery was 8.6 g/dL, and the was 13.2 g/dL. However, until now the ideal cut-off value of Hb levels for conducting operations, especially emergency operations, is still a matter of debate. Mean Hb level of less than 11 g/dl showed that 10 g/dL Hb level was found in 2 cases and 8 g/dL Hb level was in 1 case. From mean Hb levels of more than 11g/dl, as much as 11 g/dL Hb was found in 5 cases and 13 g/dL in 1 case.

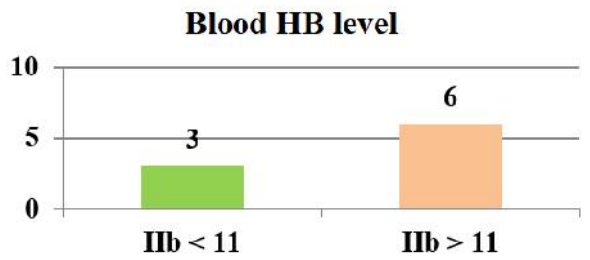

Figure 3. Characteristics according to blood hemoglobin levels

Surgical procedure (perioperative)

The patient's condition which requires surgery to be carried out in an emergency condition was found to have a role in SSI incidence. Of 9 SSI cases, one (54.72%) operation case was carried out in elective or planned conditions, and 8 (15.09%) cases of operations were performed in an emergency setting (Figure 4). The type of incision carried out in 9 SSI cases was a Pfannenstiel transverse incision performed by the same operator.

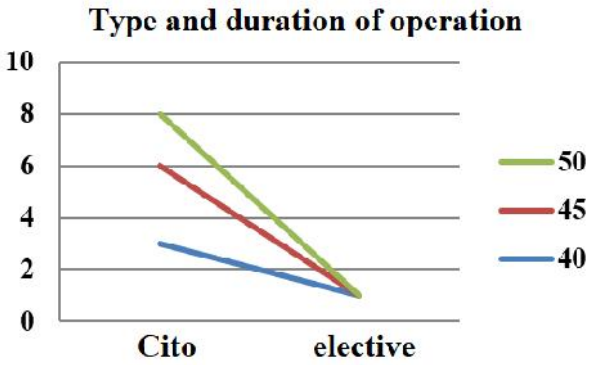

Figure 4. Characteristics by type of operation and duration of operation

Antibiotics given as prevention before surgery in 9 SSI cases were ceftriaxone. However, data regarding the timing of prophylactic antibiotics had not been listed. The fastest duration of surgery was 40 minutes and maximum 50 minutes (Figure 4). Some data showed that the Konawe Selatan Hospital did not yet have a bacteria map regarding the sensitivity and specificity of antibiotic use, so the data regarding the use of antibiotics, both as therapeutic and prophylactic antibiotics, were only based on the experience of the surgical operators.

Postoperative procedure

The number of SSI cases post-cesarean surgery in Konawe Selatan Hospital during the months of February to July 2017 was 9 cases out of 116 cases of delivery with cesarean surgery. The diagnosis of SSI was established in the Outpatient and Inpatient Clinic of Konawe Selatan Hospital if during the treatment the infection occurred in a wound due to a surgical procedure in the presence of signs of inflammation and occurred more than 2 x 24 hours without culture examination and calculated from the time of wound care and the patient discharging from the hospital. The main complaint when the patient came for visit was wet wound, yellowish liquid coming out around the wound and smelling wounds. Postoperative wound care procedures at the Konawe Selatan Hospital were carried out three days after surgery and the treatment was carried out in the ward. If the wound was regarded as dry and good, the patient was discharged and asked to visit the Outpatient Clinic for wound evaluation and continuing treatment education.

The classification of SSI patients during February-July 2017 was 4 (44.4%) SSI cases with superficial SSI and received 2x/day treatment using sugar in the outpatient ward and 5 (55.5%) other cases with deep SSI classifi-

cation and obtained treatment in the inpatient ward using sugar 2x/day (Figure 5). During treatment in the inpatient ward, of the 5 cases treated, 3 cases were treated with the result that the wound was getting better and the patient was discharged. In the other two cases, the patients were forced home with injuries that had not improved (Figures 5 and 6). The longest treatment for SSI patients in the inpatient ward was 23 days and the shortest was 5 days. Costs incurred were also not small and not infrequently also lead to mortality because the patients eventually fell in severe sepsis conditions. This shows that the consequences of having SSI are enormous, both for patients, medical personnel, and hospitals.

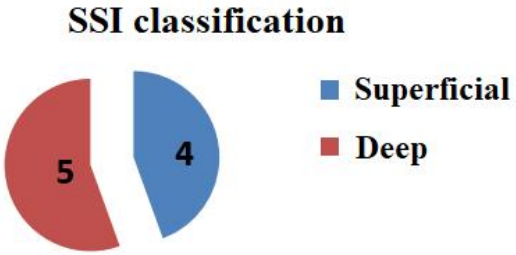

Figure 5. SSI classification of Konawe Selatan Hospital

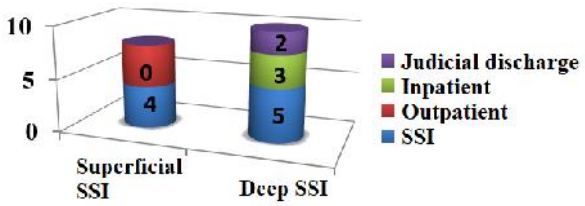

Figure 6. SSI treatment in Konawe Selatan Hospital

Environmental aspects

Regarding the domicile, a total of 9 patients with obstetric cases obtained with SSI lived in Konawe Selatan District, with referral cases from health centers were as many as 5 (55.5%) cases, independent midwife practice referrals 1 (11.1%) case and referrals from outpatient clinics were 3 (33.3%) cases (Figure 7). The basic condition of the patient as well as the existing complications at the time of referral are the factors that determine SSI risk in the referred patients. There were no definitive data regarding the causes of SSI incidence in the referral case. This was probably due to many factors that play a role in SSI incidence. One of the factors associated with referrals is distance and indications of referral cases. Indications of referral due to difficult delivery cases and long distances also affect SSI events. Closest distance in referral cases was from health centers of about 25 km with a travel time of minimally 30 minutes and the longest travel time was around 1-2 hours, which was from a health center of around 60 km from the hospital. A study in Ethiopia found that 72.7% of SSI was a referral case from rural area.[6] These data were not very different from the results of this study, where 6 (66.7%) cases of SSI were referral cases from outside the hospital.

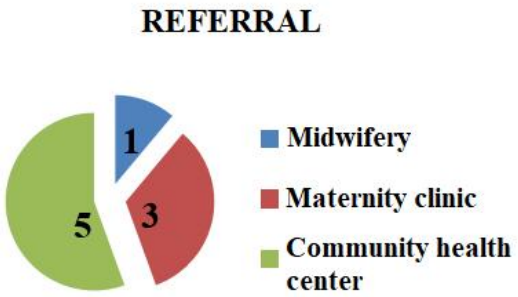

Figure 7. Characteristics according to referral

The procedure for cesarean surgery was carried out according to the indications in the obstetric field. The most indications as the cause of SSI incidence were congestion (4 cases), fetal distress (2 cases), abnormalities of fetal location (1 case), and emergency in the mother (2 cases). According to the American Society of Anesthesiologists (ASA), several factors that influence the occurrence of SSI in cesarean surgery are the time when the membranes rupture, the number of vaginal examination actions, types of surgery (elective, urgent or emergency), surgical techniques, obesity, diabetes, severe hypertension and operator techniques.[2] In SSI cases at Konawe Selatan Hospital, one case was found with ruptured membranes and 4 other cases with ruptured membrane accompanied by congestion, which may also be one of the causes of an increase in SSI cases.

Management aspects

In carrying out the operation, Konawe Selatan Hospital already has a standard set out in the SOP accompanied by trained medical personnel with evidence of training certification. The surgical team has taken action according to the procedure. However, the facilities to carry out hand washing did not meet the standards, because the type of water tap used caused difficulties after finishing hand washing so that the antiseptic goals were not met. In addition, the surgical team's hand washing technique had to be evaluated again so that all were in accordance with the applicable standards.

WHO has made surgical safety checklist to facilitate implementation before and after the surgery is complete. Based on research using this checklist, it was found that the decline meant mortality and SSI.[1] The Konawe Selatan Hospital has implemented a surgical safety checklist which consists of a sign in (containing pre-anesthesia measures and identification of the patient's identity), time out (containing preoperative actions, surgical team, equipment and type of action, preparation and to take cautious actions during surgery) and sign out (containing the introduction of the patient's identity and the surgical procedure that has been done).

Efforts to overcome SSI at Konawe Selatan Hospital

The duty to prevent infection is to find the source of infection as long as the patient lives or is hospitalized through screening various data sources. At Konawe Selatan Hospital, the surveillance (collection, recording) was carried out by the PPI team. The PPI team has filled out and collected 9 SSI cases into surveillance forms in the inpatient and outpatient wards every day. Data processing and analysis is also carried out by the PPI Team. The results are reported to the PPI committee for discussion and preparation of recommendations. The PPI Committee reports the overall results and recommendations to the hospital's director. Feedback and recommendations to related units, as well as recommendations follow-up monitoring is also carried out by the PPI team.[7] The results and recommendations to the hospital director will ultimately direct the management policies to cope with repeated SSI incidence in the future. Management policies will be established in the standard operating procedure for carrying out patients' care with the aim of the benefit of patient safety, in the operating room, and on an outpatient basis.

CONCLUSION

In February - July 2017 in Konawe Selatan Hospital the number of SSIs after cesarean section was 9 (7.75%) cases of a total of 116 caesarean section operations. The factors in the incidence of SSI post-cesarean surgery consist of: clinical aspects (preoperative, perioperative and postoperative), environmental aspects, and management aspects, some of which have been done well at the Konawe Selatan Hospital.

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