Research Article

Identification of Bacteria on Postcesarean Section Patient's Wound Operation

Identifikasi Bakteri pada Luka Operasi Pasien Pascaseksio Sesarea

Renny Aditya, Risa Dirgagita

Department of Obstetrics and Gynecology
Research Unit of Health and Medicine
Faculty of Medicine Universitas Lambung Mangkurat
Ulin General Hospital, Banjarmasin

Abstract

Objective: To determine the type of bacteria in post-cesarean surgical patient wounds obtained through the patient's surgical wound swab in the Ward Obstetrics and Gynecology RSUD Ulin Banjarmasin in the period August-October 2019.

Methods: This study was a descriptive study with a cross-sectional approach. A total of 36 samples were taken using a purposive sampling method, but only 32 bacterial isolates were obtained. Samples in the form of clean operating wound contaminated post-cesarean patients were planted on growth media and identified microscopically to be further classified based on responses to biochemical tests.

Results: Descriptive analysis shows that there are three types of bacteria, namely Staphylococcus aureus as much as 59.3%, Staphylococcus epidermidis as much as 25.0%, and Escherichia coli as much as 15.6%.

Conclusions: Obtained 3 types of bacteria in the results of surgical wound swab in post-cesarean section patients who were hospitalized in the Ward and Obstetrics Hospital of Ulin Hospital Banjarmasin, namely Staphylococcus aureus, Staphylococcus epidermidis, and Escherichia coli.

Keywords: cesarean section, contaminant bacteria, surgery wound swab.

Abstrak

Tujuan: *Mengetahui gambaran jenis bakteri pada luka operasi pasien pascaseksio sesarea yang didapat melalui swab luka operasi pasien di Bangsal Kandungan dan Kebidanan RSUD Ulin Banjarmasin dalam periode Agustus-Oktober 2019.*

Metode: *Penelitian ini merupakan studi dekskriptif dengan pendekatan potong lintang. Sebanyak 36 sampel diambil menggunakan metode purposive sampling, tetapi hanya didapatkan 32 isolat bakteri. Sampel swab luka operasi bersih terkontaminasi pasien paska seksio sesarea ditanam pada media pertumbuhan dan diidentifikasi secara mikroskopis untuk selanjutnya diklasifikasikan berdasarkan respon terhadap uji biokimia.*

Hasil: *Analisis secara deksriptif menunjukkan bahwa terdapat tiga jenis bakteri, yaitu Staphylococcus aureus sebanyak 59,3%, Staphylococcus epidermidis sebanyak 25,0%, dan Escherichia coli sebanyak 15,6%.*

Kesimpulan: *Didapatkan 3 jenis bakteri pada hasil swab luka operasi pasien pascaseksio sesarea yang dirawat inap di Bangsal Kandungan dan Kebidanan RSUD Ulin Banjarmasin, yaitu Staphylococcus aureus, Staphylococcus epidermidis, dan Escherichia coli.*

Kata kunci: *seksio sesarea, bakteri kontaminan, swab luka operasi.*

Correspondence author. Renny Aditya. rennyaditya@gmail.com

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INTRODUCTION

Patient safety is a global issue of global concern, because of the flow of information technology globalization, public knowledge about health service indicators is increasing. One indicator of patient safety related to medical measures is Surgical Injury Infection (ILO) which is a major complication experienced by inpatients. The ILO is an infection originating from nosocomial bacterial contaminants in the Hospital up to 30 days after surgery and is included in the third most commonly reported nosocomial infection for 14-16% of all infections in hospitalized patients in the Hospital.

Based on WHO data through the World Alliance for Patient Safety 2005 reported that the ILO occurs in 2-5% of the 27 million patients who operate each year.[1,2] Percentage of incidence of surgical wound infections based on research

results from the Indonesian Infection Control Association and RSPI Prof. Dr., Suliati Saroso Jakarta was 18.9% in 2003, then at the Department of Surgery Dr. Cipto Mangunkusumo Hospital (RSCM) was 10% of the total patients after adult abdominal surgery, Dr. Pringadi Medan in 2006 amounted to 12%, RSUP Dr. Sardjito in 2007 was 5.9%, and in Adam Malik General Hospital Medan in 2010 it was 5.6% .[3]

One of the most common surgical procedures that can cause the ILO is cesarean section. This surgery aims to give birth to the fetus by opening the abdominal wall and uterus.3 Surgical action and several other factors affect the skin's defence against bacterial contaminants that can cause infection in the former trauma or injury. Internal risk factors of mothers who contribute to infection of postoperative surgical wound infections are a history of obesity, choriamnionitis, and diabetes mellitus. Whereas external factors stem from airborne bacterial contaminants in the inpatient ward of the hospital ward, prophylactic antibiotic administration, duration of surgery, and long term monitoring of post-operative wound care.[1,2]

According to data at the RSUD Ulin and Gynecology Installation during 2018, there were only 362 patients undergoing cesarean section and the increase in the number of cesarean delivery methods was directly proportional to the increase in post-operative ILO events.[4] The results of approving bacterial wound swabs for the most common surgical wound infections were Pseudomonas sp. In addition, other bacteria, such as Staphylococcus aureus, Staphylococcus epidermidis, Escherichia coli, Acinetobacter sp., Klebsiella sp., and Proteus sp.[5,6]

The correct cesarean section is to follow accurate medical indications and is a life-saving procedure for mother and fetus. However, on the one hand, providing safe and timely cesarean section remains a major challenge in countries with high maternal mortality rates; increased nosocomial infection. Therefore, this review is justified as needed to study knowledge about the frequency of complications of childbirth-related to labour with cesarean section without clinical indication to assist in counselling pregnant women regarding the advantages and disadvantages of this type of procedure compared to spontaneous vaginal delivery. Thus, with the increase in labour with cesarean section in several regions in Indonesia accompanied by infectious complications, especially in Banjarmasin City Hospital, South Kalimantan, further research is needed regarding the identification of the type of bacterial contaminants for the surgical wound in postcesarean patients with sampling in hospitalized patients. inpatient in the obstetrics and gynecology ward of RSUD Ulin Banjarmasin starting from the August-October 2019 period.

METHODS

The method used in this study is descriptive, with a cross-sectional approach that is identifying bacteria from swab samples in post-cesarean surgical wounds for post-cesarean hospitalized patients in the Wards and Obstetrics Ward of RSUD Ulin Banjarmasin in the August October 2019 period. The population of this study were all post hospitalized post-cesarean in Midwives of RSUD Ulin Banjarmasin in the August-October 2019 period. as well as meeting the inclusion criteria as research subjects.

Patients are willing to be the subject of research by signing informed consent. The sampling technique is purposive sampling that matches the inclusion criteria, where all subjects who come and meet the selection criteria are included in the study until the number of required subjects is met. The number of samples taken was 36 samples. The inclusion criteria in this study were patients with post-cesarean section surgery who were treated 3x24 hours in the obstetrical and midwifery ward of Ulin Hospital Banjarmasin and were willing to participate in the study.

For sampling was to use sterile cotton swabs and rubbed on the patient's surgical scar area. After that the results of sampling were put into Bouillon media and the test tube is closed using cotton and aluminium foil. Then the sample is placed in an ice flask and taken to a laboratory for examination of bacterial identification. Sampling was done once. Isolation of the specimen is done by applying the specimen to the nutrient to tilt as a hatchery medium and incubated at 37oC for 24 hours, the growing bacterial colonies are counted and followed by bacterial identification. To identify bacteria microscopically against bacterial colonies that grow on blood agar and Mac Conkey media through Gram staining then look at the bacterial structure using a microscope with an objective magnification of 100 X. On the results of bacterial culture, Gram-positive bacteria will be purple and Gram-negative bacteria will be red. Furthermore, for Gram-positive bacteria the catalase test, mannitol test, and novobiocin test will be carried out, while for Gram-negative

bacteria a biochemical test will be carried out by placing the culture material on the test tube. Biochomia test consists of Citrate, SIM (Sulfite Indol Motility), KIA (Kliger Iron Agar), and LIA (Lysine Iron Agar).

The data obtained were collected through recording the results of bacterial identification in the wounds of patients after cesarean section based on microscopic examination and biochemical tests then tabulated and the percentage calculated.

RESULTS

Research on the identification of bacteria in surgical wounds of post-cesarean section patients in the Gynecology and Obstetric Ward of RSUD Ulin Banjarmasin was conducted in the period August-October 2019. This study used 36 samples of post-cesarean surgical wound swabs for post-cesarean section patients, but only 32 bacterial isolates were obtained.

Table 1. Table of Results of Bacterial Examination in Postoperative Patient Injuries in Caesarean in the Gynecology and Obstetric Ward of RSUD Ulin Banjarmasin.

Type of Bacteria	Amount	%
Staphylococcus aureus	19	59.4
Staphylococcus epidermidis	8	25
Escherichia coli	5	15.6
Total	32	100

DISCUSSION

These results are not much different from previous studies in the General Surgery Ward of RSUD Ulin Banjarmasin in 2013 that the bacteria that cause ILO in hospitalized patients is Staphylococcus aureus (56%), Staphylococcus epidermidis (23%), Streptococcus sp. (5%), and Pseudomonas aeruginosa (16%).[7] Results of research conducted at Dr. H. Abdoel Moeloek Bandar Lampung Hospital in 2016 based on the results of the surgical wound swab of the patient suspect the infection is Klebsiella sp. (26.7%), Staphylococcus epidermidis (16.7%), Pseudomonas aeruginosa (13.3%), Staphylococcus saprophyticus (13.3%), Staphylococcus aureus (10%), Proteus Vulgaris (3.3%), Enterobacter sp. (3.3%), and Streptococcus sp. (3.3%). While the bacteria that cause ILO in the most midwifery care rooms are Pseudomonas sp. (25%), Escherichia coli (19.44%), Klebsiella sp. (16.67%), and Staphylococcus epidermidis (13.89%).[8] Research results at the Rajah Muthaiah Hospital in India in 2010, said that the most common contaminant bacteria causing surgical site infections are Staphylococcus aureus and Escherichia coli.[9] Based on data from the National Healthcare Safety Network at the Centers for Disease Control and Prevention (2013) , reported that the most common types of bacteria were Staphylococcus aureus, Enterococcus, Pseudomonas aeruginosa, Escherichia coli, Proteus sp., and Klebsiella pneumoniae.[10]

Operation in the womb and midwifery is a type of operation that is often performed in addition to other operations. The most common type of obstetric and obstetric surgery is cesarean section and the second most is hysterectomy.[11] The two surgeries are somewhat different from other types of surgical operations because of the different operating fields in the abdominal cavity and the high risk of being contaminated by bacteria from the digestive tract, such as Escherichia coli.

At the post-cesarean ILO there are 2 categories of problems that increase the risk of the ILO in patients operating wounds, namely mechanical factors (wound infection, obesity, intra-abdominal distension, cough) and metabolic factors (uncontrolled diabetes, corticosteroid use, anaemia, hypoalbuminemia, malnutrition). ILO is the condition of opening part or all layers of abdominal incision. ILO can be divided into incomplete or partial and complete surgical wound infections. ILO is complete when only covering the skin tissue or underlying tissue, whereas infection of a complete surgical wound if the fascial and peritoneal tissue is also exposed.[11]

The types of bacteria in the surgical wound of post-cesarean patients examined in this study affect the recovery rate of patients post-surgery and medical personnel who are in this section. The discovery of Staphylococcus aureus, Staphylococcus epidermidis, and Escherichia coli in postcesarean patients who are already hospitalized in the Wards and Obstetrics Ward of RSUD Ulin Banjarmasin are influenced by two factors, namely originating from autoinfection (endogenous, self-infection) is a bacterium that is already present in the Ward of Obstetrics and Obstetrics at RSUD Ulin Banjarmasin influenced by two factors, namely originating from autoinfection (endogenous, self-infection). Exogenous (cross-infection) infection comes from the hospital environment such as operating room air, inpatient air, unsterile equipment, and hospital staff who are less implementing aseptic

and antiseptic behaviour.

To avoid nosocomial infections, every operating room will be used must be sterilized before the air and as a standard number of germs in the operating room air is about 10 CFU / m3, so that the number of germs greater than 10 can potentially cause nosocomial surgery wound infections. Besides that, inpatient air in the hospital ward, especially the obstetric and midwifery section of RSUD Ulin Banjarmasin, should be well ventilated, air in and out freely, the floor is swept and mopped daily, and the bedsheets are changed every day. Sterile equipment and officers who work aseptically, such as the sterility of all equipment used both in the operating room, inpatient room, washing hands, wearing gloves, and wearing masks, are very important in preventing nosocomial infections such as the ILO. Also not less important is that the bacteria that cause the ILO are generally resistant to antibiotics so it is difficult to be eliminated, this is possible because in the hospital environment very much is used antibiotics to treat infectious diseases, so that bacteria are often exposed to antibiotics and this condition causes mutations in genes make bacteria commonly used antibiotic resistance.[12]

CONCLUSIONS

Based on research conducted, obtained 3 types of bacteria in the results of surgical wound swab in post-cesarean section patients who were hospitalized in the Ward and Obstetrics RSUD Ulin Banjarmasin, namely Staphylococcus aureus as much as 59.4%, Staphylococcus epidermidis as much as 25.0%, Escherichia coli as much as 15.6%.

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