Profile of Bacteria and Antibiotic Sensitivity Test in the Case of the Wound Infection Post Section Caesaria in RSUD Dr. Saiful Anwar Malang on January 2012-October 2016 Period

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Abstract: Wound infection after section Caesaria is one form of nosocomial infections. This study aimed to determine characteristic the samples namely, the prevalence of post section Caesaria, profiles of bacterial infections and antibiotic sensitivity test in the Hospital Dr. Saiful Anwar Malang Indonesia in the period January 2012-October 2016. The study design was observational descriptive retrospective. The sampling method used in this study is total sampling taken from the medical record in the intervening period January 2012-October 2016. The results showed that the sample was 4,809. The study successfully revealed the characteristics of the study, namely, age, educational level, occupation, hospital sheed, indication, hospitalization time and leucocyte account. The prevalence of infection after section cecaria sample found as many as 15 people (2.16%) while non-infectious cases is as much as 4,794 (99.5%). Profile group of Gram-positive bacteria were found more than a Gram-negative group. Of the group Gram-positive bacteria most commonly found are coagulase negative Staphylococcus (40%). The group of Gram-negative are most commonly found is Escherichia coli and Klebsiella pneumoniae (13.33%), respectively. Most coagulase negative Staphylococcus sensitive to groups of aminoglycoside antibiotics (Amikacin and Netilmicin). As for Escherichia coli sensitive to Fosfomycin, Meropenem, Amoxicillin+Clavulanic group Pipericillin/Tazobactam.

Key words: Wound infection post section Caesaria, bacterial profile, antibiotic patterns, nosocomial infections, educational level, Escherichia coli and Klebsiella pneumoniae

INTRODUCTION

Caesaria section is a way of giving birth surgery through the abdominal wall (laparotomy). Request section Caesaria without a clear indication it causes a higher amount. In the USA found an increase section Caesaria which in 1996 was 20.7% in 2006 and 31.1%

Data an increase Cesaria section cases in Indonesia began in 2003. There were cases of 46.87% in 2004 rose to 53.2% in 2005 to 51.59% in 2006 to 53.68% (Grace and Borley, 2007). Results of national survey in 2009 showed as many as 921,000 births (22.8%) performed with section Caesaria which is part of the 4,039,000 births. The number of cases section Caesaria in government hospitals in 2006 is approximately 20-25% of the total number of deliveries. While in private hospitals the number is as high as 30-80% of the total number of births (Depkes, 2006). The largest hospital Dr Soetomo's in East Java, Caesaria section cases in 2008 was 1.47% (23.3%) with the total number of births as much as 6,335.6. In addition, based on annual reports Hospital Dr. Saiful Anwar Malang which is smaller than the city of Surabaya in 2012 found as many as 1618 deliveries were performed with Caesaria (Anonymous. 2006).

The mortality rate of Caesaria section is 5.8/100,000 success birth while the morbidity rate is 27.3% compared to normal childbirth which is 9/1000 cases. WHO (World Health Organization) suggest that the number of section Caesaria only 10-15% from the total childbirth. WHO suggestion is based on risks analysis that may occurs because of section Caesaria. National Health Service NHS in 2013 said from 2,552 women sample, 1,479 (58%) women giving birth normally. While as much as 1,073 (42%) giving birth by section Caesaria (565 was planned and 508 was not planned). According to, Healey (1997) and Hayati (2010), surgery on abdominal section is one of the risk factor that can cause wound infection.
The wound infection post section Caesaria diagnosis should be based on whether or not the pus is present on the wound. Bacteriologic check in form of smear with gram stain and culture is need to be done to know the bacteria that caused the infection and also to know the right treatment. The development of germ resistance to antibiotics is heavily on the intensity usage exposure usage of antibiotic in some region, the usage of antibiotic that cut of control is likely to increase the resistance of a germ that is sensitive in the first place. Some surveys on prescription whether domestic or overseas, antibiotic beta-lactam is the most antibiotic that being prescript, so, the germ already resistance to the antibiotic.

Most of antibiotic usage happens in hospital but not all of them have a program to observe the resistance of germ, control the infection, observe the antibiotic usage in hospital, making a new guide for the antibiotic usage and prophylaxis also monitoring the resistance test, so, it can be used to know the antibiotic that still potent, safe and effective and produce the good clinical outcomes (Hayati, 2010).

In our study, it has been disclosed on matters relating to post infection section Cesarean reviewed from: karater sample, the prevalence of bacteria and test sensitivity to anti biota. Expectations of the results of this study are to be input to reduce the number of cases, knowing the appropriate antibiotics used in wound infection after section Caesaria in Hospital Dr. Saiful Anwar Malang.

MATERIALS AND METHODS

This study is observational descriptive study in retrospective to know the profile of bacteria and antibiotic sensitivity test in the case of the wound infection post section Caesaria in RSUD Dr. Saiful Anwar Malang January on 2012-October 2016 period.

Sample used in this study is all medical record and the result of pus swab culture of the patient with wound infection post section Caesaria in RSUD Dr. Saiful Anwar Malang on January 2012-October 2016 in accordance with the criteria of inclusion and exclusion.

RESULTS AND DISCUSSION

Characteristic study sample: To meet the requirements of the characterization of the 24 samples was only 15. The results are shown in Table 1. Based on the data in the table found a group of non-productive age >35 years, 7 (46.67%) samples. The same percentage amount is found in the character education level samples is dominated by high school (bachelor), 7 (46.67%) samples. This type of work is mostly housewives as many as 10 people (66.66%). It is also known from clinical status showed that anemia was found in 6 (40%) samples. The same samples are found also in diabetes mellitus 4 (26.67%) samples. Most indicative of section Cesarean delivery is an emergency of the sample. As for as the cause is pre-eclampsia 4 (26.67%) samples, amniotic fluid is not normal in 2 (13.33%) samples and baby malpresentation 2 (13.33%). In addition, also known hospitalization time by Table 1, the longest was >3 days with a total of 13 people (86.67%) followed by 2-3 days by 2 people (13.33%). Furthermore, from this sample study of 11 samples (73.33%) showed leukocytes >11.3.

Based on Fig. 1, the total births by section Cesarean during the period January 2012 through October 2016 is 4,809 samples. Of the total sample of Cesarean section there were 24 (3.84%) samples of surgical wound infection. Each amount of infection after Cesarean section in the order that began in 2012 through 2016, respectively are: 0.25, 0.31, 0.93, 0.6 and 1.39%.
**Antibiotic sensitivity pattern to bacteria:** Based on Table 3 of 24 kinds of antibiotics, Gram-positive bacteria, especially *Staphylococcus* negative coagulase is the most sensitive to the antibiotic of the aminoglycosides group as much as 66.67%. Found 100% resistance to antibiotics of the Cephalosporin group, β-lactams, Amoxicillin and Meropenem. Furthermore, diketals *Staphylococcus aureus* to antibiotics of the group of aminoglycosides, cefotaxime, Tetracycline and Fosfomycin is 100% sensitive. *Streptococcus pneumoniae* bacteria sensitive to the antibiotic Piperacillin/Tazobactam (66.67%), Amikacin (50%), Fluoroquinolones group (50%) and Meropenem (50%). Later it was found also a lot of resistance that is 100% of the antibiotics from the group of cephalosporins (cefadroxil, ceftriaxone, cephalidine, cefazolin, cefotaxime, cefuroxime, cefazidime), a group of Penicillin (amoxicillin and ampicillin), group tetracycline (Doxyecyl and tetracyclines), gentamicin, chloramphenicol and Fosfomycin, *Staphylococcus haemolyticus* has a high sensitivity (100%) to Vancomycin and Trimethoprim/Sulfamethoxazole. Levofloxacin against (50%). It can be seen also has 100% resistance to Cephalosporin group, Gentamicin, Ciprofloxacin, Amoxicillin, Tetracycline and Meropenem.

Gram negative bacteria that is *Escherichia coli* is known to be sensitive to antibiotic Fosfomycin (100%), Meropenem (100%), followed by antibiotic Amoxicillin+Clavulanic acid (100%), Amikacin (100%) and Levofloxacin (100%). In bacteria *Klebsiella pneumoniae* sensitive to antibiotic Piperacillin/Tazobactam (66.67%), followed by Fluoroquinolones group (Ciprofloxacin and Levofloxacin) (50%), Amikacin (50%) and Meropenem (50%). Also many 100% resistance to Cephalosporin group (Cefadroxil, Ceftriaxone, Cephalidine, Cefazolin, Cefotaxime, Cefuroxime and Cefazidime), Penicillin group (Amoxicillin and Ampicillin), Tetracycline (Doxyecylone and Tetracycline), Gentamicin, Chloramphenicol and Fosfomycin. While in bacteria *Pseudomonas aeruginosa* have sensitivity leves as much as 100% to antibiotic Cefazidime, Gentamycin, Amikacin, Ciprofloxacin, Levofloxacin, Piperacillin/Tazobactam and Meropenem. But the most resistance to Ceftriaxone (100%), Cefazolin (100%), Ampisilin (100%) and Trimethoprim/Sulfamethoxazole (100%).

Based on Table 3, also discovered that bacteria *Salmonella enterica* 100% sensitive to antibiotic Netilmicin, Meropenem and Fosfomycin. But there are also many resistance to antibiotic Cephalosporin group (Cefadroxil, Ceftriaxone, Cephalidine, Cefazolin, Cefotaxime, Cefuroxime and Cefazidime), aminoglycosides.

**Bacteria pattern:** Five patient have two isolate bacterial. 1st: *Salmonella enterica* and *Salmonella arizonae*; 2nd: *Klebsiella pneumoniae* and *Streptococcus pneumoniae*; 3rd: *Klebsiella pneumoniae* and *Streptococcus pneumoniae*; 4th: *Escherichia coli* and *Staphylococcus* coagulase negative, 5th: *Acinetobacter baumannii* and *Staphylococcus* coagulase negative.

Based on Table 2 have been found 11 species of gram positive cocci bacteria from the culture pus wound infection post section Cesarea were 24 samples. This type of bacteria found: coagulase negative *Staphylococcus* 6 (40%) samples, *Staphylococcus aureus* 2 (13.33%) samples, *Streptococcus pneumoniae* 2 (13.33%) samples and *Staphylococcus haemolyticus* 1 (6.67%) samples. There were 11 samples of Gram negative rod bacteria were found. In addition, the remaining seven samples were found with various types of bacteria and in each (6.67%) samples found bacteria that is different from the others. The bacteria are *Pseudomonas aeruginosa*, *Salmonella arizonae*, *Burkholderia pseudomallei*, *Acinetobacter baumannii* and *Salmonella enteritidis*.

So, the results of this study showed that the bacteria most commonly found are coagulase negative *Staphylococcus* (40%), followed by Gram-negative *Escherichia coli* (13.33%) and *Klebsiella pneumoniae* up (13.33%).

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**Table 2:** Profile of bacteria isolated from post Cesarean section infection patient at Safiul Anwar Hospital in Malang Indonesia between 2012 until 2016 premises

<table>
<thead>
<tr>
<th>Bacteria types</th>
<th>N = 15</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gram positive bacteria</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Staphylococcus</em> coagulase negative</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>2</td>
<td>13.33</td>
</tr>
<tr>
<td><em>Streptococcus pneumoniae</em></td>
<td>2</td>
<td>13.33</td>
</tr>
<tr>
<td><em>Staphylococcus haemolyticus</em></td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td><strong>Gram negative bacteria</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>2</td>
<td>13.33</td>
</tr>
<tr>
<td><em>Klebsiella pneumoniae</em></td>
<td>2</td>
<td>13.33</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td><em>Salmonella arizonae</em></td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td><em>Burkholderia pseudomallei</em></td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td><em>Acinetobacter baumannii</em></td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td><em>Salmonella enterica</em></td>
<td>1</td>
<td>6.67</td>
</tr>
<tr>
<td>Name Isolated</td>
<td>Antibiotics</td>
<td>S. haemolyticus</td>
</tr>
<tr>
<td>--------------</td>
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</tr>
<tr>
<td></td>
<td>Ceftriaxone</td>
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<td></td>
<td>Cefotaxime</td>
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<td></td>
<td>Ceftazidime</td>
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<td></td>
<td>Amoxicillin</td>
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<td></td>
<td>Ciprofloxacin</td>
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<tr>
<td></td>
<td>Chloramphenicol</td>
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<td></td>
<td>Fosfomycin</td>
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<td></td>
<td>Metronidazole</td>
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<td></td>
<td>Doxycycline</td>
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<td></td>
<td>Tetracycline</td>
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<td></td>
<td>Ampicillin</td>
<td>100 100 100</td>
</tr>
</tbody>
</table>

Group (Gentamycin and Amikacin), Fluoroquinolone group (Oflaxacin, Ciprofloxacin and Levofloxacin), Amoxicillin+Clavulan acid, Amoxycillin, Doxycycline and Trimethoprim/Sulfamethoxazole as much as 100%. In bacteria Burkholderia pseudomallei shows 100% sensitivity to antibiotic amoxylgyside group (Gentamycin, Amikacin and Netilmicin) Fluoroquinolone group (Oflaxacin, Ciprofloxacin and Levofloxacin), Cefazidime and Meropenem. Aside from that shows high resistance as much as 100% resistance to antibiotic Cephalosporin group (Cefadroxil, Ceftriaxone, Cefadrine, Cefazoline, Cefotaxime and Cefuroxime), Amoxicillin+Clavulan acid, Amoxycillin, Tetracycline (Doxycycline and Tetracycline), Chloramphenicol, Fosfomycin and Trimethoprim/Sulfamethoxazole. Next, bacteria Acinetobacter baumannii shows high sensitivity level to antibiotic Amikacin (100%), Levofloxacin (100%), Ampicillin (100%) and Meropenem (100%). While bacteria Salmonella enterica have the highest sensitivity to antibiotic Netilmicin (100%), Fosfomycin and...
Meropenem (100%). Discovered 100% resistance to antibiotic Cephalosporin group ((Cefadroxil, Ceftriaxone, Cephadrine, Cefazoline, Cefoxime, Cefuroxime and Cefazidine), aminoglycoside group (Gentamycin and Amikacin), Fluoroquinolone group (Ofloxacin, Ciprofloxacin and Levofloxacin), Amoxicillin+Clavulanic acid, Amoxicillin, Doxycycline and Trimethoprim/Sulphamethoxazole.

**Characteristic of sample:** In this study, it is discovered that wound infection post section Caesaria in RSUD Dr. Saiful Anwar Malang on January 2012-October 2016 period is likely to happen on patient from group age >35 years. This is accordance with the fact before between age and wound healing process. The result of this analysis also supported by theory from Hidefat and Uliyah that say the speed of cell replenishment is reciprocal with the development or the maturity of someone but the process of aging can slow down the cell replenishment, so, it will slow down the process of wound healing that can cause wound infection.

About the characteristic of the last education level, from the sample it is known to be high school. The study before also find the same result but it don’t find any correlation between education level with wound infection because it only the general preview of population that come to the hospital. In the same study, Sidabutar et al. also find the same result about the characteristic of work where the most work known from the sample is housewife.

Most of the sample has history of anemia followed by Diabetes Mellitus. Study in Semarang Indonesia on 2010, stated that there is significant connection between anemia and the process of wound healing because of the lower the hemoglobin someone have the longer the wound will be healed, so, it will increase the risk of wound infection (Widyaningrum, 2010). The next hospital sheet from the sample is Diabetes Mellitus. This is accordance with the previous study where there is significant connection between diabetes mellitus with wound healing. After the study done with 38 respondents, 3 people (7.89%) have infection and all of those 3 having diabetes mellitus, so, there is potential of wound infection when they undergo surgery (Indiarti, 2009).

Characteristic of sample shows that there are lots of indications of section Caesaria surgery caused by the emergency condition of the mother caused by severe pre-eclampsia. This fact is supported by literature that said mother that having severe pre-eclampsia or eclampsia must undergo section Caesaria. The next thing is about the duration of the patient’s hospital sheet are >3 days. This study is supported by previous study done in Semarang on 2012, said that statistically there are significant connection between the duration of hospital sheet and the case of nosocomial infection (Rosaliya et al., 2012).

On the characteristic of the amount of leukocyte, it is discovered that most of the sample that have infection also have leukocyte >11.3×10^9/L. This condition might happened because the reaction of immune system to bacteria infection.

**Prevalence of infection and non-infection sample:** The result of this study shows that the prevalence of childbirth with section Caesaria from 2012-2016 went down while the non-infection sample and the one that have wound infection post section Caesaria from 2012-October 2016 are fluctuate. Based on study in Suleymaniye Hospital Istanbul, Turki Obstetric Gynecology and Microbiology Laboratory shows as much as 5.787 women giving birth with section Caesaria, 74 women have 1.27% chance of having wound infection after section Caesaria. From 5.787 cases, 1.037 (17.92%) are section Caesaria childbirth caused by emergency condition and as much as 4.750 (82.08%) are elective section Caesaria. The 18 womans (0.37%) found have wound infection post elective section Caesaria and 56 women (5.4%) have wound infection caused by emergency section Caesaria (Rosaliya et al., 2012). If this is compared with percentage of wound infection post section Caesaria cases in RSUD Dr. Saiful Anwar Malang on October 2016 that is 1.39% where it is nearly the same with Turki, this shows that the procedure of pre and post surgery already good in RSUD Dr. Saiful Anwar. Besides that evaluation is still needed in case of another factors that have correlation with pre and post surgery action to lower the chance of wound infection post section Caesaria.

**Bacteria pattern:** The result of this study shows there are 11 types of bacteria from pus swab culture on patient with wound infection post section Caesaria. The types Gram positive bacteria that has been found are *Staphylococcus coagulase negative* as much as 6 cases (40%), *Staphylococcus aureus* as much as 2 cases (13.33%), *Streptococcus pneumoniae* as much as 2 cases (13.33%) and *Staphylococcus haemolyticus* as much as 1 case (6.67%).

While on Gram negative bacteria there are: *Escherichia coli* as much as 2 cases (13.33%), *Pseudomonas aeruginosa* as much as 1 case (6.67%), *Salmonella arizona* as much as 1 case (6.67%).
Burkholderia pseudomallei as much as 1 case (6.67%), Acinetobacter baumanii as much as 1 case (6.67%) and Salmonella enteric as much as 1 case (6.67%). So, based on this result, the ost bacteria that has been found are bacteria Staphylococcus coagulase negative that is 40%, followed by Staphylococcus aureus that is 13.33% and Streptococcus pneumoniae that is 13.3%. Next is Escherichia coli that is 13.33% and Klebsiella pneumoniae that is 13.33%.

In the study on 2012 about the bacteria pattern on infection post section Cesaria with the study title “a study on isolation of different type of bacteria from pus”. Bacteria that found most on the pus specimen almost the same but the proposition that make it different are Staphylococcus aureus (40%), Klebsiella spp. (33%), Pseudomonas aeruginosa (18%), Escherichia coli (16%) and Pseudomonas spp. (7%) (Ilhan et al., 2016).

It is also, the same on the study in Kathmandu Hospital Nepal, it shows that the pathogen germ that cause wound infection are Staphylococcus aureus (37.5%) and Escherichia coli (25%) (Verma, 2012). The difference on the result might happen because changing of bacteria pattern that applied to the pus specimen. Factors that influence the changing of bacteria pattern are the difference of immune response, genetics factor of population, the difference of microbiology analysis, the difference of educational level and the medical treatment also the changing of antibiotic usage pattern (Raza et al., 2013).

Gram positive bacteria type Staphylococcus coagulase negative is the most. This is occurred because that bacteria is normal flora that naturally exist in human skin, so, it is easier to make the wound is infected after surgery (Kardana, 2016). Then followed by Gram negative bacteria Escherichia coli that found in the study sample because laparotomy is surgery that done in abdomen region, so, it is likely to contaminated by normal flora bacteria from the intestine (Warganevara et al., 2012).

Bacteria sensitivity patter to antibiotic: in this study we can know that the types of bacteria that we can find the most from pus swab culture is Gram positive bacteria Staphylococcus coagulase negative is most sensitive to antibiotic aminoglycoside group that are Amikacin and Netilmycin as much as 67.67%. Also shows a 100% resistance to antibiotic from cephalosporin group that are Cefadroxil, Ceftriaxone, Cephadrine, Cefazolin, Cefotaxime, Cefuroxime and Feftazidime, Amoxycillin, Meropenem, β-lactam group that are Amoxycillin+Clavulanic acid and Piperacillin/Tazobactam. While on Gram negative bacteria that is Escherichia coli is most sensitive to antibiotic Fosfomycin (100%), Meropenem (100%), Amoxycillin+Clavulanic acid (100%), Amikacin (100%) and Levofloxacin (100%). The next is Klebsiella pneumoniae known to be sensitive to antibiotic Piperacillin/Tazobactam (66.67%), followed by Fluocinonol group that are Ciprofloxacin and Levofloxacin as much as 50% also, antibiotic Amikacin and Meropenem as much as 50%. Many resistance to Cephalosporin group that are Cefradoxil, Ceftriaxone, Cephadrine, Cefazolin, Cefotaxime, Cefuroxime, Cefazidime (100%), Gentamycin (100%), Penicillin group that are Amoxicillin and Ampicillin (100%), Tetracycline group that are Doxyecyle (100%) and Tetracycline (100%), Chloramphenicol (100%) also, Fosfomycin (100%).

This is accordance with the previous study that report that the resistance of bacteria Staphylococcus coagulase negative rise up to antibiotic cephalosporin group that are Cefotaxime, Ceftriaxone, Cefuroxime and Cefalexillin. The resistance increase is so, high to antibiotic cephalosporin third generation that are Cefotaxime and Ceftriaxone (Rahiana, 2011).

Based on the studied it is known that, Escherichia coli and Klebsiella pneumoniae are sensitive to antibiotic Meropenem. That is because Meropenem have wide spectrum, including the bacteria that have resistance to Penicillin, Aminoglycoside and Cephalosporin. So, Meropenem shows good sensitivity on most of the gram negative and gram negative bacteria (Elliott et al., 2013).

Most of the bacteria that cause wound infection post section Cesaria in RSUD Dr. Saiful Anwar Malang on Jauari 2012-October 2016 period show highest resistance to Cephalosporin group, Penicillin, Gentamycin and Tetracycline. The study result on ILO patient in India Hospital also shows that Escherichia coli and Klebsiella pneumoniae are resist to Ampicillin, Ceftriaxone and Gentamycin.

From this study result, it is known that bacteria sensitivity pattern to antibiotic can change. This is happen because the pattern and the sensitivity of the bacteria will change depend on the place and time (Mathai et al., 2001). So, further research and monitoring is need to be done in case of bacteria sensitivity pattern to antibiotic on wound infection post section Cesaria in RSUD Dr. Saiful Anwar Malang.

CONCLUSION

The amount of childbirth with section Cesaria from 2012-October 2016 are 4,809 people. The prevalence of
non-infectious patients is 4.785 people (99.5%) and those with infection post section Cesaria are 24 people (0.49%).

The most bacteria that has been found in the result of pus swab culture on wound infection post section Cesaria on January 2012-October 2016 period are Staphylococcus coagulase negative, Escherichia coli, Klebsiella pneumonia.

The sensitivity test of the bacteria to antibiotic shows that Staphylococcus coagulase negative are sensitive to antibiotic Aminoglycoside group that are Amikacin and Netilmicin. Escherichia coli are sensitive to Fosfomycin, Meropenem, Amoxyceillin+Clavullanic acid, Amikacin and Levofloxacin. Klebsiella pneumonia are sensitive to Pipercillin/Tazobactam, Fluoroquinolino group that are Ciprofloxacin and Levofloxacin, Amikacin and Meropenem.

SUGGESTIONS

Development checking of bacteria and sensitivity test to antibiotics need to be conducted periodically to get the guide of antibiotic therapy.

Seeing the result of the study, further research from RSUD Dr. Saiful Anwar Malang is needed to decided the right antibiotic as a fix procedure of antibiotic therapy on the handling of patient with wound infection post section Cesaria.

To minimize the chance of infection post section Cesaria, the improvement and evaluation of pre and post action procedure of section Cesaria surgery is needed.

REFERENCES


