THE EFFECT OF PERIOPERATIVE AND PROPHYLACTIC ANTIBIOTICS AGAINST THE INCIDENCE OF UTI AND SURGICAL SITE INFECTIONS AFTER HYPOSPADIAS SURGERY

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ABSTRACT

Objective: *The aim of this study is to analyze the effect of perioperative and prophylactic antibiotics against the incidence of urinary tract infections (UTI) and surgical site infections (SSI) after hypospadias surgery (hypospadias repair operation).* ***Materials & Methods:*** *This study is an observational study of explanation with 24 hypospadias patients (2 groups) during the period of October 2015 to February 2016. Samples were divided into two groups, 12 patients received prophylactic antibiotics and 12 patients received perioperative antibiotics (random sampling). Inclusion criteria included patients with glandular hypospadias to proximal penile hypospadias, aged 6 months until 15 years and underwent hypospadias surgery with one surgical technique namely Tubularized Incised Plate (TIP). The examination of urine culture and evaluation of the wounds were performed on day 4, 10, and 20 day after surgery to determine the incidence of urinary tract infections and surgical site infections.* ***Results:*** *There is no significant difference in the incidence of UTI on on day 4, 10 and 20 in perioperative group and prophylaxis group with p=0.282 and p=0.500 at day 4 and 10 (p>0.05). There is no significant difference in the incidence of SSI on day 4, 10 and 20 in the group of perioperative antibiotic and prophylactic antibiotic with p=0.680 and p=0.217 at day 4 and 10 (p>0.05).* ***Conclusion:*** *There is no effect of the prophylactic antibiotic as well as perioperative antibiotic treatment on the incidence of UTI and SSI*

Keywords: *Urinary tract infection, surgical site infection, hypospadias, tubularized incised plate.*

ABSTRAK

Tujuan: *Tujuan penelitian ini adalah untuk menganalisis pengaruh pemberian antibiotik perioperatif dan profilaksis terhadap kejadian infeksi saluran kemih (ISK) dan infeksi luka operasi (ILO) setelah operasi hipospadia.* ***Bahan & cara:*** *Penelitian ini merupakan studi observasional eksplanasi dengan 24 pasien hipospadia (2 kelompok) selama periode Oktober 2015 sampai dengan Februari 2016. Sampel dibagi dua kelompok, 12 pasien mendapat antibiotik profilaksis dan 12 pasien mendapat antibiotik perioperatif (random sampling). Kriteria inklusi meliputi pasien hipospadia tipe glanular sampai penil proksimal, usia 6 bulan sampai 15 tahun dan menjalani operasi hipospadia dengan satu tehnik operasi yaitu Tubularized Incised Plate (TIP). Pemeriksaan kultur urine dan evaluasi luka dilakukan pada hari ke 4, 10, dan 20 paska operasi untuk mengetahui kejadian infeksi saluran kemih dan infeksi luka operasi.* ***Hasil:*** *Tidak terdapat perbedaan yang bermakna kejadian ISK pada hari ke 4, ke-10, dan ke-20 pada kelompok antibiotik profilaksis dan perioperatif dengan p=0.282 dan p=0.500 pada hari ke 4 dan ke 10. (p>0.05) Tidak terdapat perbedaan yang bermakna kejadian ILO pada hari ke 4, ke-10, dan ke-20 pada kelompok antibiotik profilaksis dan perioperatif dengan p=0.680 dan p=0.217 pada hari ke 4 dan ke 10. (p>0.05).* ***Simpulan:*** *Tidak ada pengaruh pemberian antibiotik secara profilaksis maupun perioperatif terhadap kejadian ISK dan ILO.*

Kata kunci: *Infeksi saluran kemih, infeksi luka operasi, hipospadia, tubularized incised plate.*

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INTRODUCTION

Hypospadias is a congenital abnormality in the form of the urethral orifice located on the ventral penile and proximal of the glans of penis.[1-3] Based on the location of the urethral orifice, hypospadias is divided into three types namely: (1) anterior hypospadias: the type of glandular, subcoronal and

distal penile hypospadias, (2) medius hypospadias: the type of mid-shaft and proximal penile, and (3) posterior hypospadias: the type of penoscrotal, scrotal and perineal.[3] Hypospadias results from failure of the fold urethral closure in pregnancy.[4]

Hypospadias is the most congenital abnormality of the urethra and male genitalia formation with a number of events of 1 in 300 (0.33%) of male live births.[1] In some developing countries found a different incident of 0.26 in 1000 (0.026%) of male live births in Mexico and 2.11 in 1000 (0.21%) in Hungaria.[2]

Surgery is the action required in the management of hypospadias. The purpose of surgery is to repair a bent penis shape due to the ocurence of Korde extending the urethra to the glans of penis.[5] Hypospadias surgery can cause complications including bleeding, infection, fistula, meatal stenosis and urethral stricture.[5] Data from research conducted by Bhat et al. found the most common complications in patients after hypospadias surgery among others, 35% of the fistula, 10% of infections, 8% of meatal stenosis, 7% of urethral stricture, and 5% of bleeding.[5] The infection is a complication that can lead to increased incidence of fistula and delay the healing process.[5] Surgical site infections (SSI) is an infection that occurs after surgery by the presence of inflammation and pus.[6] While urinary tract infection (UTI) is an infection that occurs in the urinary tract by the symptom of fever and cloudy urine indicated by the presence of bacteria from urine culture examination. Control of the incidence of infections can be done by giving antibiotics both before surgery as prophylactic antibiotic and continued several days after surgery as perioperative antibiotic.[7] Prophylactic antibiotics are the antibiotics given to patients who have not been affected to infections but have a great chance to get an infection with the aim of preventing the surgical site infections, preventing post-surgical morbidity and mortality, and reducing the length of treatment.[8] The administration is done 30 minutes before surgery intravenously or ideally given at anesthesia induction.[8] Basic of prophylactic antibiotic selection is in accordance with the pattern of most pathogenic bacteria in the case in question, the narrow spectrum to reduce the risk of bacterial resistance and affordable price.[8] While perioperative antibiotics are the antibiotics given before surgery as prophylactic antibiotic and the administration is continued orally 24 hours after surgery.[8]

The first and second generation of cephalosporin antibiotics are used as a prophylactic antibiotics. In this study will use cefazolin as a prophylactic antibiotics as it is effective against gram-positive bacteria and has a moderate activity against gram-negative bacteria. The dose used is 50 mg/kg by intravenous bolus given at anesthesia induction. Cefadroxil of 20 mg/kg is used as perioperative antibiotic given orally 24 hours post operatively until day 10 or when the catheter off.

Perioperative antibiotic treatment in patients with postoperative hypospadias is still debatable.[1,9] Baillargeon et al, found that single dose of prophylactic antibiotics is not associated with the incidence of urinary tract infections and skin wound infections after hypospadias surgery, but it is very difficult to not recommend using antibiotics altogether or antibiotic prophylaxis alone in patients with postoperative hypospadias.[1] Majority of pediatric urologists provides perioperative antibiotics in patients with hypospadias surgery.[9-11]

OBJECTIVE

Perioperative or prophylactic antibiotic treatment in hypospadias surgery remains controversial and has not been investigated in Indonesia, therefore this study is conducted.

MATERIAL & METHODS

Type of this research is an observational study of explanation because I want to explain the effect of antibiotic treatment on the incidence of urinary tract infections and surgical site infections. The design of the study is a prospective study which observes the incidence of infections on the prophylactic and perioperative antibiotics treatment in patients with hypospadias after surgery. This study was conducted from October 2015 to February 2016 with the study population was hypospadias inpatient patients that underwent surgery in the Dr. Soetomo General Hospital Surabaya and met the criteria for age of 6 months to 15 years, suffering glandular hypospadias type tol proximal penile that would undergo urethroplasty, using one surgical technique of Tubularized Incised Plate (TIP) and willing to participate in the research. The population was excluded in the study if patients presented with a history of first-generation cephalosporin antibiotic allergies, had other abnormalities in the field of urology: urinary tract stones, kidney function disorders and malignancies in the field of urology, as well as the presence of bacteria ≥105 cfu/ml from the

urine culture examination checked before surgery. The population was excluded from the study if it did not control to urology of Dr. Soetomo Hospital up to 20 days post-surgery.

Sampling was done by random sampling method in accordance with predetermined criteria. The results were recorded, collected and processed with SPSS version 21 software. Data collected performed different test using Chi square test (α=0.05).

RESULTS

It was found the total sample (2 groups) as much as 24 hypospadias patients. Overall samples of the study met the inclusion and exclusion criteria. Samples were divided into two groups (random sampling) namely group of prophylactic antibiotics and perioperative antibiotics. The overall samples underwent hypospadias surgery with one surgical technique that is Tubularized Incised Plate (TIP). Urine culture examination and evaluation of the wounds were done on day 4, 10, and 20 after surgery to determine the incidence of urinary tract infections and surgical site infections.

Table 1 illustrates that the age of hypospadias patients in group of prophylactic antibiotics is (13.41 ± 1.31) years, with the youngest aged 11 years old and the oldest aged 15 years old. While the average age of hypospadias patients in group of perioperative antibiotic group is (9.75 ± 3.96) years, with the youngest aged 4 years old and the oldest aged 15 years old. Results of statistical test using t^2 independent samples show significant difference with p=0.009 (p<0.05).

Table 2 shows the type of subcoronal and distal penile hypospadias that is most widely obtained on prophylactic antibiotic group respectively by 3 patients (25%), while glandular hypospadias type, mid-shaft and proximal penile respectively by 2 patients (16.7%). Subcoronal hypospadias type is most widely obtained on perioperative antibiotic group that is 5 patients (41.7%), whereas proximal penile is obtained at least as many as 1 patient (8.3%).

Table 3, 4, and 5 respectively illustrate urine culture examination on day 4 in group prophylactic antibiotics obtained 10 patients (83.3%) with a positive urine culture results and 2 patients (16.7%) with Sterilee urine culture results. In the peri-

Table 3. Description of the presence of bacteria on day 4.

	Prophylactic	Perioperative
Positive	10 (83.3%)	5 (62.5%)
Sterile	2 (16.7%)	9 (37.5%)
Total	12 (100%)	12 (100%)

Table 4. Description of urine culture results on day 4.

Number of Bacteria	Prophylactic	Perioperative
$<10^4$	6 (60%)	1 (20%)
$\geq 10^4$	4 (40%)	4 (80%)
Total	10 (100%)	5 (100%)

Table 1. Description of patients' age in the two groups.

Group	X ± SD	Min	Max	p
Prophylactic	13.41 ± 1.31	11	15	0.009
Perioperative	9.75 ± 3.95	4	15	
Total	11.58 ± 3.43	4	15	

Table 2. Description of hypospadias type.

Diagnose	Prophylactic	Perioperative
Hipospadia Glanular	2 (16.7%)	2 (16.7%)
Hipospadia subkoronal	3 (25%)	5 (41.7%)
Hipospadia Penile Distal	3 (25%)	2 (16.7%)
Hipospadia Midshaft	2 (16.7%)	2 (16.7%)
Hipospadia Penile Procsimal	2 (16.7%)	1 (8.3%)
Total	12 (100%)	12 (100%)

Table 5. Description of type of bacteria in urine culture on day 4.

Kinds of Bacteria	Prophylactic	Perioperative
Pseudomonas aeruginosa	5 (41.7%)	2 (16.7%)
Acinobacter baumanii	3 (25%)	0 (0%)
Klebsiella pneumonia	0 (0%)	1 (8.3%)
Paturella aeruginosa	1 (8.3%)	0 (0%)
Enterobacter faecalis	0 (0%)	1 (8.3%)
Staphylococcus aureus	1 (8.3%)	1 (8.3%)
Sterile	2 (16.7%)	7 (58.3%)
Total	12 (100%)	12 (100%)

operative antibiotics group found 5 patients (41.7%) with a positive urine culture results and 7 patients (58.3%) with Sterile urine culture results. Of the 10 patients, 4 patients (40%) had urinary tract infections (UTI) with bacteria results of ≥ 10^4 cfu/ml and 6 patients (60%) with bacteria results of <10^4 cfu/ml. Of 5 patients in the perioperative group, 4 patients (80%) experienced UTIs with bacteria results of ≥ 10^4 cfu/ml and 1 patient (20%) with bacteria results of <10^4 cfu/ml. The X^2 test/Fisher Exact Test showed no significant difference in the incidence of UTI on day 4 between the two groups mentioned above with p=0.282 (p>0.05).

The type of bacteria mostly obtained in urine culture on day 4 in prophylactic antibiotic group is Pseudomonas aeruginosa of 5 (41.7%), Acinobacter baumannii of 3 (25%), Staphylococcus aureus of 1 (8.3%) and Paturella aeruginosa of 1 (8.3%). While on perioperative antibiotic group, the type of bacteria mostly obtained is Pseudomonas aeruginosa of 2 (16.7%), Klebsiella pneumonia of 1 (8.3%), Enterobacter faecalis of 1 (8.3%) and Staphylococcus aureus of 1 (8.3%).

Table 6, 7, and 8 show an urine culture examination on day 10 in prophylactic antibiotic group obtained 7 patients (58.3%) with a positive urine culture results and 5 patients (41.7%) with Sterile urine culture results. In the perioperative antibiotic group obtained two patients (16.7%) with a positive urine culture results and 10 patients (83.3%) with Sterile urine culture results. Of the 7 patients,

Table 6. Description of the presence of bacteria on day 10.

	Prophylactic	Perioperative
Positive	7 (58.3%)	2 (16.7%)
Sterile	5 (41.7%)	10 (83.3%)
Total	12 (100%)	12 (100%)

Table 7. Description of urine culture results on day 10.

Number of Bacteria	Prophylactic	Perioperative
10^3–10^4	3 (42.9%)	0 (0%)
≥10^5	4 (57.1%)	2 (100%)
Total	7 (100%)	2 (100%)

Table 8. Description of type of bacteria in urine culture on day 10.

Kinds of Bacteria	Prophylactic	Perioperative
Pseudomonas aeruginosa	1 (8.3%)	1 (8.3%)
E.coli	1 (8.3%)	0 (0%)
Klebsiella pneumonia	1 (8.3%)	0 (0%)
Citrobacter freundii	1 (8.3%)	0 (0%)
Enterobacter faecalis	1 (8.3%)	0 (0%)
Staphylococcus aureus	1 (8.3%)	0 (0%)
Staphylococcus schilef	1 (8.3%)	0 (0%)
Enterococcus faecium	0 (0%)	1 (8.3%)
Sterile	5 (41.7%)	10 (83.3%)
Total	12 (100%)	12 (100%)

4 patients (57.1%) experienced UTIs with bacteria results of ≥ 10^5 cfu/ml and 3 patients (42.9%) with bacteria results of <10^5 cfu/ml. In perioperative group, 2 of 2 patients (100%) experienced UTIs with bacteria results of ≥ 10^5 cfu/ml and no patients (0%) with bacteria results of <10^5 cfu/ml. The X^2 test/Fisher Exact Test showed no significant difference in the incidence of UTI on day 10 between the two groups mentioned above with p=0.500 (p>0.05).

The type of bacteria found on day 10 of urine culture in the group of prophylactic antibiotics is Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylococcus aureus, E coli, Citrobacter freundii, Enterococcus faecalis, and Staphylococcus schilef respectively of 1 (8.3%), while in the group of perioperative antibiotic is Pseudomonas aeruginosa and Enterococcus faecium respectively of 1 (8.3%).

Table 9 illustrates the urine culture examination on day 10 of prophylactic antibiotic group obtained 4 patients (33.3%) with a positive urine culture results, and 8 patients (66.7%) with Sterile urine culture results. While in perioperative antibiotic group obtained no patients (0%) with positive urine culture results and 12 patients (100%) with Sterile urine culture results. Table 10, there is one patient (25.0%) of the 4 patients with UTIs with bacteria results of ≥ 10^5 cfu/ml and 3 patients (75.0%) with bacteria results <10^5 cfu/ml. Since all patients in the perioperative group presented with Sterile urine culture results (100%), it does not require comparison test between the two groups. From the evaluation of urine culture examination on day 4, 10, and 20 obtained the increased Sterile urine culture results in the prophylactic group of 16.7%, 57.1%, and 66.7%. it is similar with the perioperative group that obtained the increased Sterile urine culture results of 58.83%, 83.3% and 100%.

In the prophylactic group, the incidence of UTI was constant from day 4 to day 10 and then decreased from day 10 to day 20 (4, 4, and 1 patients), while in the perioperative group showed no difference in the pattern of the decreased incidence of UTI from day 4 to 10 and to 20 namely 4, 2, and 0 patients/no UTIs.

Table 9. Description of the presence of bacteria on day 20.

	Prophylactic	Perioperative
Positive	4 (33.3%)	0 (0%)
Sterile	8 (66.7%)	12 (100%)
Total	12 (100%)	12 (100%)

Table 10. Description of urine culture results on day 20.

Number of Bacteria	Prophylactic	Perioperative
10^3–10^4	3 (75.0%)	0 (0%)
≥10^5	1 (25.0%)	0 (0%)
Total	4 (100%)	0 (0%)

Table 12. Description of surgical site infections (SSI) on day 4.

Pus	Prophylactic	Perioperative
Not Exist	6 (50%)	8 (66.7%)
Exist	6 (50%)	4 (33.3%)
Total	12 (100%)	12 (100%)

Table 12 shows the evaluation of surgical wounds on day 4 in prophylactic antibiotic group, a total of 6 patients (50%) had surgical site infections (SSI) with pus, while in the perioperative antibiotic group, 4 patients (33.3%) experienced surgical site infections (SSI). The X^2 test/Fisher Exact Test showed no significant difference in the results of surgical site infections (SSI) on day 4 between the two groups with p=0.680 (p>0.05).

Table 11. Description of type of bacteria in urine culture on day 20.

Kinds of Bacteria	Prophylactic	Perioperative
Pseudomonas aeruginosa	1 (8.3%)	0 (0%)
E.coli	1 (8.3%)	0 (0%)
Klebsiella pneumonia	1 (8.3%)	0 (0%)
Enterobacter faecalis	1 (8.3%)	0 (0%)
Sterile	8 (66.7%)	12 (100%)
Total	12 (100%)	12 (100%)

Table 13. Description of surgical site infections (SSI) on day 10.

Pus	Prophylactic	Perioperative
Not Exist	9 (75.0%)	12 (100%)
Exist	3 (25.0%)	0 (0%)
Total	12 (100%)	12 (100%)

The table above illustrates the surgical wounds on day 10 in the group of prophylactic antibiotics as many as three patients (25.0%) who had obtained the SSI with pus, whereas in the perioperative antibiotic group, none of the patients (0%) experienced SSI. The X^2 test/Fisher Exact Test showed no significant difference in the results of surgical site infections (SSI) on day 10 between the two groups with p=0.217 (p>0.05).

Table 14. Description of surgical site infections (SSI) on day 20.

Pus	Prophylactic	Perioperative
Not Exist	12 (100%)	12 (100%)
Exist	0 (100%)	0 (100%)
Total	12 (100%)	12 (100%)

Evaluation of wounds observed on day 20, shown in Table 14, obtained no SSI with pus in the surgical wounds of the 24 patients (2 groups). Due to the absence of SSI on perioperative and prophylactic antibiotic group, comparison test was not performed between the two groups.

DISCUSSION

From the results of this study, the average age of patients with hypospadias in prophylactic antibiotic group was (13.41 ± 1.31) years, with the youngest aged 11 years old and the oldest aged 15 years old. While the average age of patients with hypospadias in perioperative antibiotic group was (9.75 ± 3.96) years, with the youngest aged 4 years old and the oldest aged 15 years old. Optimal age for hypospadias surgery is 6 months to 5 years or before school age.[12] At times, hypospadias surgery needs two stages for the presence of severe Korde or due to complications such as fistula that requires reoperation.[13] Therefore hypospadias surgery should done before school age so as not disrupt the learning process in the school.[12]

Pseudomonas aeruginosa is a type of bacteria mostly obtained in urine culture on day 4, in prophylactic antibiotic group of 5 patients (41.7%) and also on perioperative antibiotic group of 2 patients (16.7%). The type of bacteria found in the urine culture on day 10 in the group of prophylactic antibiotics are Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylococcus aureus, E coli, Citrobacter freundii, Enterococcus faecalis, and Staphylococcus schilef each of 1 (8.3%), while in the group of perioperative antibiotics are Pseudomonas aeruginosa and Enterococcus faecium each of 1 (8.3%). In the examination of urine culture on day 20, the type of bacteria obtained in the group of prophylactic antibiotics are Pseudomonas aeruginosa, Klebsiella pneumoniae, E coli, and Enterococcus faecalis but only 1 patient with bacteria results of ≥ 105 cfu/ml, the perioperative antibiotics group did not obtain bacteria from the urine culture in all patients. Pseudomonas aeruginosa and Klebsiella pneumoniae are a gram-negative bacterium, a pathogen that often causes a local infection in patients after hypospadias surgery.[5] It is in accordance with the research from Meir and Livne that Pseudomonas aeruginosa and Klebsiella pneumoniae are a type of pathogenic germs that mostly obtained in postoperative hypospadias patients.[10]

In the examination of urine culture on day 4 used limit of colonies ≥ 10^4 cfu/ml for urine samples were taken from the catheter. In prophylactic antibiotics group obtained 10 patients (83.3%) with a positive urine culture results and 2 patients (16.7%) with Sterile urine culture results. Of the 10 patients, 4 patients (40%) experienced UTIs with bacteria results of ≥ 104 cfu/ml and 6 patients (60%) with bacteria results <10^4 cfu/ml. While in perioperative antibiotic group obtained 5 patients (41.7%) with a positive urine culture results and 7 patients (58.3%) with Sterilee urine culture results. Of the 5 patients, 4 patients (80%) experienced UTIs with bacteria results of ≥ 10^4 cfu/ml and 1 patient (20%) with bacteria result of <10^4 cfu/ml. The use of catheters can be the source of the most common cause of nosocomial urinary tract infections. The risk of bacteriuria was associated with duration of catheterization. The risk of bacteriuria increased by 5-10% per day after the catheter.[14]

In the examination of urine culture on day 10, the group of prophylactic antibiotics obtained 7 patients (58.3%) with a positive urine culture results and 5 patients (41.7%) with Sterile urine culture

results. Of the 7 patients, 4 patients (57.1%) experienced UTIs with bacteria results of ≥ 10^5 cfu/ml and 3 patients (42.9%) with bacteria results of <10^5 cfu/ml. While in perioperative antibiotic group obtained 2 patients (16.7%) with a positive urine culture results and 10 patients (83.3%) with Sterile urine culture results. Of the 2 patients, 2 patients (100%) experienced UTIs with bacteria results of ≥ 10^5 cfu/ml and no patients (0%) with bacteria results of ≥ 10^5 cfu/ml. It is in accordance with the research from Baillargeon and kanaroglou et al, that the use of perioperative antibiotics should not be used routinely because there was no difference in the incidence of urinary tract infections in the two groups.[1,9] The indication of use of prophylactic antibiotics was based on the clean and clean contaminated surgery. Basic of prophylactic antibiotic selection is in accordance with the sensitivity and the pattern of most pathogenic bacteria in the case in question, a narrow spectrum to reduce the risk of bacterial resistance, low toxicity, bactericidal and affordable prices.[8] In this study, the pattern of most pathogenic bacteria are Pseudomonas aeruginosa and Klebsiella using a first-generation cephalosporin prophylactic antibiotic that is effective against gram-positive and has a moderate activity against gram-negative.

In the examination of urine culture on day 20, in prophylactic antibiotic group obtained 4 patients (33.3%) with a positive urine culture results, and 8 patients (66.7%) with Sterile urine culture results. Of these 4 patients, 1 patient (25.0%) experienced UTIs with bacteria results of ≥ 10^5 cfu/ml and 3 patients (75.0%) with bacteria results of <10^5 cfu/ml. While in perioperative antibiotic group did not obtain patients with a positive urine culture results and 12 patients (100%) with Sterile urine culture results. In the urine culture results above, the two groups did not receive antibiotics but in prophylactic group, 1 patients obtained UTIs with bacteria results of ≥ 10^5 cfu/ml without signs of fever. Asymptomatic bacteriuria are very common and associated with commensal colonization. The prevalence of asymptomatic bacteriuria reached 3.5% and increased by the age. The diagnosis of asymptomatic bacteriuria was made by taking a midstream urine sample that showed bacterial growth of ≥ 10^5 cfu/ml on two consecutive samples with period up to 24 hours without signs of fever.[15]

In this study, the SSI is an infection on surgical wounds characterized by pus in surgical wounds and may or may not be accompanied by swelling, redness and pain seen after loose bandage (day 4 to 10 and to 20 post-surgery). In the evaluation of surgical wound on day 4 in prophylactic antibiotic group, a total of 6 patients (50%) had surgical site infections (SSI) with pus, while in the perioperative antibiotic group, 4 patients (33.3%) had surgical site infections (SSI). The X^2 test/Fisher Exact Test showed no significant difference in the results of surgical site infections (SSI) on day 4 between the 2 groups with p=0.680 (p>0.05).

In the examination of surgical wounds on day 10, in the group of prophylactic antibiotics obtained 3 patients (25.0%) who experienced the SSI with pus, whereas in the group of perioperative antibiotics, none of the patients (0%) with the SSI. The X^2 test/Fisher Exact Test showed no significant difference in the results of surgical site infections (SSI) on day 10 between the 2 groups with p=0.217 (p>0.05). It is in line with the study by Baillargeon et al, where there is no difference in the incidence of surgical site infections between the 2 groups.[1] Aerobic bacteria are the dominant cause of bacterial pathogens in surgical site infections. The risk of an SSI may be affected by the skills of the surgical team that is the length of the surgery, the source of endogenous and exogenous bacteria, as well as length of preoperative hospitalization also can facilitate the occurrence of SSI.[8,16]

CONCLUSION

There is no effect of prophylactic and perioperative antibiotics treatment on the incidence of UTI and the SSI on day 4, 10, and 20.

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