

ANTIBIOTIC PROPHYLACTICS ON CURETTAGE FOR PREVENTING PELVIC INFLAMMATORY DISEASE EVENTS: IS IT NECESSARY?

FAUNA HERAWATI^{1*}, ABDUL RAHEM², DWI HANDAYANI¹, RIKA YULIA¹

¹Department of Clinical and Community Pharmacy, Faculty of Pharmacy, University of Surabaya, Jalan Raya Kalirungkut, Surabaya, 60293, Indonesia. ²Department of Community Pharmacy, Faculty of Pharmacy, Airlangga University, Jalan Darmawangsa Dalam, Surabaya, 60286, Indonesia. Email: fauna@staff.ubaya.ac.id

Received: 08 June 2018, Revised and Accepted: 10 July 2018

ABSTRACT

Objective: This study aimed to compare pelvic inflammatory disease (PID) symptoms in curettage procedure with three antibiotic prophylaxis strategies.

Methods: The patients were allocated to three Groups (A, B, and C). Group A was patients receiving prophylactic antibiotics and post-curettage antibiotics, Group B received prophylactic antibiotics without post-curettage antibiotics, and Group C did not receive prophylactic antibiotics but received post-curettage antibiotics. The outcomes measured to identify the occurrence of PID symptoms included leukocytes, erythrocyte sedimentation rate, temperature, pain, vaginal discharge, and bleeding.

Results: This study shows that there were no significant differences in any PID symptoms between antibiotic strategies except for pain scale ($p=0.03$).

Conclusion: The PID symptoms between the three strategies of antibiotic prophylaxis were similar.

Keywords: Antibiotic prophylaxis, Curettage, Obstetrics and gynecology department, Pelvic inflammatory disease.

© 2018 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>) DOI: <http://dx.doi.org/10.22159/ajpcr.2018.v11i11.27817>

INTRODUCTION

The antibiotic discovery is confine [1], but there is an abundant use of antibiotics not only occur at community [2] but also at the hospital [3,4]. The perspective database (Premier Inc., Charlotte, NC), a voluntary database that captures data from >500 acute-care hospitals from throughout the United States, was used to analyze antibiotic use in women who underwent inpatient or outpatient gynecologic surgery between 2003 and the first quarter of 2010. The database analysis result shows that antibiotics are increasingly being administered to women who underwent gynecologic surgery from 88.0% in 2003 to 90.7% in 2010 ($p<0.001$). Among 491,071, who underwent operations for which antibiotics were not recommended, antibiotics were administered to 197,226 (40.2%); among 545,332 women who underwent procedures for which antibiotics were recommended, 87.1% received appropriate antibiotic prophylaxis, 2.3% received nonguideline-recommended antibiotics, and 10.6% received no prophylaxis [5].

Prophylactic antibiotics aim to prevent the incidence of surgical wound infections, reduce the incidence of post-operative morbidity and mortality, inhibit the emergence of normal resistant flora, and reduce the cost of treatment. In general, prophylactic antibiotics in the surgical procedure are not used to sterilize tissues but to suppress the presence of microorganisms until the patient's immune system can resist the microorganisms present during the surgical procedure [6,7].

The selection of antibiotics used in hospitals is based on the policy or guidelines on the use of antibiotics, diagnostic and therapeutic guidelines, as well as the hospital formulary. Therefore, each hospital has a different policy with regard to the use of antibiotics, since the principle of antibiotic selection is based on the conditions in each hospital, including the fitness of antibiotics with local bacterial sensitivity in the hospital, as well as the cost-effectiveness of the antibiotics used. The benefit of the administration of prophylactic antibiotics for curettage procedure remains unclear and controversial. Some studies suggest that antibiotic prophylaxis in curettage is ineffective while others found

that antibiotic prophylaxis in curettage is effective in reducing the occurrence of infection.

An infection that can potentially occur in curettage is a pelvic inflammatory disease (PID), an infection of the upper female reproductive system that is related to endometritis, salpingitis, and pelvic peritonitis. PID can lead to more serious reproductive disabilities, including infertility, ectopic pregnancy, and chronic pelvic pain [8-10].

Research evidence on the effectiveness of prophylactic antibiotics on curettage has been limited and controversial [6,7,9]. The justification to use antibiotic is because the curettage procedure performs transvaginally, and the patients had a risk of infection by pathogens in the lower genital tract [11]. One research which supports not giving antibiotic prophylactics for the curettage procedure is a prospective study by Al-Ghoweri *et al.* conducted at King Hussein Medical Center, in Amman, Jordan, showing that the PID incidence was 9.5% in Group I (prophylactic antibiotics were administered) and 10.14% in Group II (prophylactic antibiotics were not administered), for which this difference was not statistically significant [12]. Whereas, research which shows the benefit of antibiotic prophylaxis in curettage procedure includes a study which found a significant reduction in post-operative PID in low-risk patients, who were applying for legal first-trimester abortion and treated pre-operatively with ceftriaxone [13]. In a systematic review, the author concludes that antibiotic prophylaxis may be beneficial in the first-trimester suction curettage [14].

This research aimed to compare the incidence of PID between several regimens of antibiotic administered in patients with curettage procedure.

METHODS

The study was conducted at a private secondary care hospital with 50 beds, PKU Muhammadiyah Hospital, Jalan K.H.M Mansyur 180-182, in Surabaya, Indonesia. From May 2015 to July 2016, there were 60 subjects who met study criteria and were classified into three groups:

(i) Group A was a group of patients who received 1 × 2 g of prophylactic antibiotic cefazolin injection and 3 × 500 mg of post-antibiotic amoxicillin, (ii) Group B was a group of patients who received 1 × 2 g of prophylactic antibiotic cefazolin injection without post-antibiotics, and (iii) Group C was a group of patients who did not receive prophylactic antibiotics but received 3 × 500 mg of post-antibiotic amoxicillin. After 5-days follow-up, PID symptoms were identified by observation of the occurrence of leukocyte >10,500 mm³, erythrocyte sedimentation rate (ESR) >15 mm/L, lower abdominal pain, temperature >38°C, changes in vaginal fluid characteristics including odor and consistency in vaginal discharge, and bleeding outside the menstrual cycle (irregular bleeding). The pain levels were measured with a numerical pain rating scale (NPRS). NPRS is a pain measurement in the form of a straight line scale consisting of number scores of 0–10: 1–3 is a mild pain, 4–7 is a moderate pain, and 8–10 is a severe pain. Vaginal discharge and bleeding were categorized as 1 - none, 2 - a few, and 3 - approximately twice less from number 2.

One-way ANOVA or non-parametric Kruskal-Wallis tests were used to analyze the data's distribution and significance statistically.

RESULTS AND DISCUSSION

Curettage is the most common services done in PKU Muhammadiyah Hospital, and on average, there are 15 patients per month with various indications, either based on diagnostic indications, such as irregular menstrual bleeding, severe menstrual bleeding, and postmenopausal bleeding, or therapeutic indications, such as endometrial hyperplasia, endometrial polyps, stem submucosal myomas, residual conception products after abortion, and failed abortions. PKU Muhammadiyah Hospital does not have any antibiotic guidelines for the curettage procedure, even though antibiotics are always given to the patient. This study showed that the patients' characteristics were similar. The average age was 32 years in Group A, 30 years in Group B, and 35 years in Group C. There were several patient curettage indications (Table 1). The common curettage indication was abortion: 65% in Group A, 65% in Group B, and 70% in Group C. The rate of abortion indication in this hospital is similar to other health facilities in Indonesia. A study conducted in the year 2000 from some health facilities in six regions in Indonesia showed that approximately two million abortions were done in Indonesia, including an unknown number of spontaneous abortions, which was underestimated [15]. The annual abortion rate is 37 in every 1000 women with reproductive ages of 15–49 years. The study also reported that 760,000 (17%) of the 4.5 million annual births were unwanted or unplanned. The situation in Indonesia is high compared to other Asian countries, with 29 abortions in every 1000 women [16].

The occurrence of the PID symptoms between groups was similar, except pain (Table 2). The mean NPRS Group A was 1.5 (group A), Group B was 1.75, and Group C was 1.05 ($p=0.03$). The mean NPRS between Groups A and B was 0.45, indicating a difference of 0.45 with an increasing tendency in Group A (since the value was positive). The mean NPRS between Groups A and B was -0.25, indicating a difference of 0.25 with an increasing tendency in Group B (since the value was negative). The NPRS mean difference between Groups A and B was 0.7, indicating a difference of 0.7 with an increasing tendency in Group B (since the value was positive). Unlike a study at Bengaluru [17], this study shows that there are no significant differences in any PID symptom except pain between antibiotic strategies. This result confirms a previous study which showed that there was no significant difference found between high-risk patients treated with ceftriaxone or ampicillin/pivampicillin and metronidazole [13]. In addition, a systematic review concluded that the antibiotic prophylaxis effectiveness is similar between several antibiotic regimens [18].

Although rare, it is possible to develop multivalvular, right-sided, and left-sided endocarditis [19,20] or endogenous candida endophthalmitis [21]. Consideration to give antibiotic prophylaxis is for the patient which have the endocarditis or endophthalmitis risk. In general, the antibiotic is not effective to prevent PID after curettage [22,23]. A study in 67 women, 1 month after an endometrial curettage,

Table 1: Patient characteristics

Characteristics	Group A (%)	Group B (%)	Group C (%)
Age (Years)			
17–22	4 (20)	8 (40)	5 (25)
23–28	10 (50)	4 (20)	7 (35)
29–34	4 (20)	5 (25)	3 (15)
35–40	1 (5)	2 (10)	3 (15)
41–46	1 (5)	1 (5)	1 (5)
47–52	0 (0)	0 (0)	1 (5)
Indication			
Abortus incomplete	13 (65)	13 (65)	14 (70)
Dead conceptus	3 (15)	1 (5)	2 (10)
Blighted ovum	3 (15)	4 (20)	2 (10)
Fluxus pervaginam	1 (5)	2 (10)	1 (5)
Mola hidatidosa	0 (0)	0 (0)	1 (5)
Polip endocervix			
Menometrorrhagia			
Leukocyte			
>10,500 mm ³	1	2	0
Erythrocyte sedimentation rate			
>15 mm/l	5	10	14
Abdominal pain (NPRS 1–10)			
1–3	19 (95)	20 (100)	18 (90)
4–7	1 (5)	0 (0)	2 (10)
8–10	0 (0)	0 (0)	0 (0)
Temperature			
>38°C	0	0	0
Vaginal discharge			
1	19 (95)	20 (100)	17 (85)
2	1 (5)	0 (0)	3 (15)
3	0 (0)	0 (0)	0 (0)
Bleeding			
1	4 (20)	5 (25)	7 (35)
2	11 (55)	9 (45)	11 (55)
3	5 (25)	6 (30)	2 (10)

Table 2: Pelvic inflammatory disease symptoms after 5-day follow-up

Characteristics	Group A (%)	Group B (%)	Group C (%)
Leukocyte			
>10,500 mm ³	2 (10)	0 (0)	0 (0)
Erythrocyte sedimentation rate			
>15 mm/l	7 (35)	11 (55)	14 (70)
Abdominal pain (NPRS 1–10)			
1–3	12 (60)	9 (45)	19 (95)
4–7	6 (30)	7 (35)	1 (5)
8–10	2 (10)	4 (20)	0 (0)
Temperature			
>38°C	0 (0)	0 (0)	0 (0)
Vaginal discharge			
1	20 (100)	17 (85)	19 (95)
2	0 (0)	3 (15)	1 (5)
3	0 (0)	0 (0)	0 (0)
Bleeding			
1	13 (65)	4 (20)	9 (45)
2	7 (35)	10 (80)	9 (45)
3	0 (0)	0 (0)	2 (10)

PID occurs in four women from intervention group who received doxycycline 200 mg daily for 1 week after the procedure and three women from the control group who did not receive any antibiotic regimen ($p>0.05$) [24]. Another study with 84 women with uterine curettage showed that only two cases of endometritis were found in the group who were given 0.1 ml of Vitamin B complex intravenously 20 minutes before curettage but none in the group who 1 g of cefoxitin intravenously 20 minutes before curettage ($p=0.241$) [25].

CONCLUSION

There was no significant difference except pain in the occurrence of PID's symptoms after curettage procedure and there was no difference in improvement of symptoms between the three strategies of antibiotic prophylaxis, pre- and post-curettage procedure.

AUTHORS' CONTRIBUTIONS

All authors contributed equally. All authors read and approved the final manuscript.

CONFLICTS OF INTEREST

All authors have none to declare.

REFERENCES

- Niranjana ES, Kumar RS, Sudha M, Venkateswaramurthy N. Review on clinically developing antibiotics. *Int J Appl Pharm* 2018;10:13-8.
- Herawati F, Hartono ID, Pranajaya D, Narindra IP. Antibiotic use at primary healthcare centers in Surabaya: A surveillance study. *Int J Pharm Pharm Sci* 2017;9:41-4.
- Muslim Z. Antibiotic prescription to pediatric in hospital Bengkulu, Indonesia: ATC/DDD index. *Int J Pharm Pharm Sci* 2018;10:31-4.
- Wikaningtyas P, Sigit JI, Sukandar EY, Gunawan I. Profile of antibiotic resistance and usage pattern in icu of private hospital in Bandung, Indonesia. *Int J Pharm Pharm Sci* 2015;7:160-2.
- Wright JD, Hassan K, Ananth CV, Herzog TJ, Lewin SN, Burke WM, et al. Use of guideline-based antibiotic prophylaxis in women undergoing gynecologic surgery. *Obstet Gynecol* 2013;122:1145-53.
- American College of Obstetricians and Gynecologists. ACOG practice bulletin no. 120: Use of prophylactic antibiotics in labor and delivery. *Obstet Gynecol* 2011;117:1472-83.
- Van Schalkwyk J, Van Eyk N. Antibiotic prophylaxis in obstetric procedures. *J Obstet Gynaecol Can* 2010;32:878-84.
- Brunham RC, Gottlieb SL, Paavonen J. Pelvic inflammatory disease. *N Engl J Med* 2015;372:2039-48.
- Thinkhamrop J, Laopaiboon M, Lumbiganon P. Prophylactic antibiotics for transcervical intrauterine procedures. *Cochrane Database Syst Rev* 2007;18:CD005637.
- Sweet RL. Treatment strategies for pelvic inflammatory disease. *Expert Opin Pharmacother* 2009;10:823-37.
- Lassey AT, Adanu KR, Newman MJ, Opintah JA. Potential pathogens in the lower genital tract at manual vacuum aspiration for incomplete abortion in Korle Bu Teaching Hospital, Ghana. *East Afr Med J* 2004;81:398-401.
- Al-Ghoweri A, Jumaian N, Ababneh B, Ayoub SS. Efficacy of post-dilatation and curettage antibiotic prophylaxis in women with dysfunctional uterine bleeding in the prevention of pelvic inflammatory disease. *J R Med Serv* 2007;14:66-8.
- Henriques CU, Wilken-Jensen C, Thorsen P, Mslser BR. A randomised controlled trial of prophylaxis of post-abortion infection: Ceftriaxone versus placebo. *Br J Obstet Gynaecol* 1994;101:610-4.
- Morrill MY, Schimpf MO, Abed H, Carberry C, Margulies RU, White AB, et al. Antibiotic prophylaxis for selected gynecologic surgeries. *Int J Gynaecol Obstet* 2013;120:10-5.
- Utomo B. Angka Aborsi dan Aspek Psiko-Sosial di Indonesia: Studi di 10 Kota Besar dan 6 Kabupaten. Jakarta: Pusat Penelitian Kesehatan Universitas Indonesia; 2002. p. 7.
- Sedgh G, Singh S, Shah IH, Ahman E, Henshaw SK, Bankole A. Induced abortion: Incidence and trends worldwide from 1995 to 2008. *Lancet* 2012;379:625-32.
- Mihirkumar B, Ashley S, Nawaz S, Surekha G, Paarakh PM. Assessment of two or more antibiotics regimen in post-operative surgery. *Int J Pharm Pharm Sci* 2017;9:188-91.
- Low N, Mueller M, Van Vliet HA, Kapp N. Perioperative antibiotics to prevent infection after first-trimester abortion. *Cochrane Database Syst Rev* 2012;3:CD005217.
- Jeppson PC, Park A, Chen CC. Multivalvular bacterial endocarditis after suction curettage abortion. *Obstet Gynecol* 2008;112 2 Pt 2:452-5.
- McKenna T, O'Brien K. Case report: Group B streptococcal bacteremia and sacroiliitis after mid-trimester dilation and evacuation. *J Perinatol* 2009;29:643-5.
- Chang TS, Chen WC, Chen HS, Lee HW. Endogenous *Candida endophthalmitis* after two consecutive procedures of suction dilatation and curettage. *Chang Gung Med J* 2002;25:778-82.
- Sacks PC, Tchabo JG. Incidence of bacteremia at dilation and curettage. *J Reprod Med* 1992;37:331-4.
- Panke CL, Bonilha MM, Loreto MS, Savaris RF. Incidence of uterine post abortion infection at Hospital de Clinicas de Porto Alegre. Is prophylactic antibiotic necessary? *Rev Col Bras Cir* 2014;41:100-5.
- Makris N, Iatrakis G, Sakellaropoulos G, Rodolakis A, Michalas S. The role of antibiotics after dilatation and curettage in women with metrorrhagia in the prevention of pelvic inflammatory disease. *Clin Exp Obstet Gynecol* 2000;27:27-8.
- Titapant V, Cherdchoogiat P. Effectiveness of cefoxitin on preventing endometritis after uterine curettage for spontaneous incomplete abortion: A randomized controlled trial study. *J Med Assoc Thai* 2012;95:1372-7.