PRELIMINARY REPORT

VAGINAL SCRUB PROPHYLAXIS IN ABDOMINAL HYSTERECTOMY

Valai Vinkomin

Department of Obstetric Gynecology, Chon Buri Hospital, Chon Buri 20000, Thailand

Abstract. This study was aimed at reducing postoperative infection after abdominal hysterectomy in Chon Buri Hospital. Thirty patients scheduled for total abdominal hysterectomy were randomly divided equally into two groups of 15 patients each and received different preoperative preparation procedures. Group I patients received the procedure routinely used at Chon Buri Hospital comprising vaginal scrubbing in the evening before the operation day followed by abdominal scrubbing in operating room, whereas group II patients received the same treatment as Group I with additional vaginal scrubbing with 10% povidone-iodine immediately prior to the operation. All patients were given routinely antibiotics prophylaxis. After removal of the uterus, the discharge from the vaginal cuff was taken before and after closing the vaginal stump for aerobic and anaerobic cultures. Only 3 of group II patients (20%) were culture-positive before closure of vaginal cuff compared with 11 (73%) of group I patients ($p < 0.01$). After closure of the vaginal cuff, the prositive bacterial culture declined to 5 (33%) in group I and 2 (13%) in group II ($p > 0.05$). Most of isolated organisms were vaginal normal flora. Postoperative infection with *E. coli* occurred in 2 patients of group I and none of group II ($p > 0.05$). Our result suggested that additional prophylactic vaginal scrubbing reduced postoperative bacterial infections, but this observed reduction did not reach a statistically significant level. Thus a larger sample size is needed to substantiate whether vaginal scrubbing could be advocated in a routine practice.

INTRODUCTION

To reduce postoperative infections following total abdominal hysterectomy, several procedures have been attempted including prophylactic antibiotics (Mittendorf *et al,* 1993; Matkaris *et al,* 1991; Thompson 1992), different surgical techniques (Thompson, 1992), and preoperative vaginal preparations (Thompson, 1992; Zakut *et al,* 1987). Prescribe routine prophylactic antibiotics and vaginal cleansing with 10% povidone-iodine solution in the evening before the operation day, the prevalence of postoperative infection in patients with total adbominal hysterectomy in Chon Buri Hospital, 80 km east of Bangkok was still considerably high. In January to December 1993, 7 of 140 (5%) cases receiving total abdominal hysterectomy at Chon Buri Hospital had postoperative bacterial infections. Since most of the serious infections ascended from the vaginal (Houong *et al,* 1991; Kristiansen *et al,* 1990; Kubota *et al,* 1992), this study was carried out to determine whether the use of preoperative immediate vaginal scrubbing with 10% povidone-iodine solution could reduce the postoperative infection following total abdominal hysterectomy.

MATERIALS AND METHODS

Patients: From December 1994 to March 1995, 30 patients were scheduled for abdominal hysterectomy at Chon Buri Hospital. The patients included in the study showed neither obvious signs of infections nor received prior antibiotics treatment. These patients were free from underlying diseases including diabetes mellitus, hypertension and anemia. They were divided randomly into two groups of 15 patients each, group I received routine preoperative care at Chon Buri Hospital comprising vaginal and perineal cleansing with 10% povidone-iodine solution in the evening before operation, intravenous administration of 1 gram of sodium ampicillin half an hour before operation, followed by 1 gram intravenously every 6 hours for 24 hours and 500 mg of sodium ampicillin every 6 hours orally for another 4 days (McDonal *et al,* 1988). In the operating room before surgery, patients' abdomen were cleansed with 10% povidone-iodine, scrubbed for 3 minutes followed by reapplication of povidone-iodine solution. Surgery was performed by attending physician. Group II patients received similar treatment as above but with additional scrubbing of

vagina in lithotomy position with 10% povidone-iodine solution after she had been anesthetized.

Vaginal discharge were collected from these two groups of patients before and after closure (after inserting a gauze soaked with 10% povidone-iodine solution in vaginal canal before suturing of the vaginal cuff). The collected specimens were cultured for aerobic and anaerobic organisms using standard procedures. If there was clinical evidence of postoperative infectious morbidity, cultures for aerobic and anaerobic bacteria were carried out from infected sites including abdominal wounds.

Definition of morbidity

Criteria for infectious morbidity included fever for ≥ 38°C on two successive occasions at 6 hours apart (Zakut *et al,* 1987) and peripheral blood leukocytosis of ≥ 15,000/ml. If diagnoses of vaginal cuff and/or abdominal wound infections, pelvic cellulitis and urinary tract infections were made, bacterial cultures of deep vaginal discharge, urine and pus from infected wound were also carried out. Patients suspected of having postoperative infections were treated with broad spectrum antibiotics intravenously for a minimum of 72 hours. Infected wounds were drained and allowed to heal.

Statistical analysis

Student's *t* test and Fisher's exact test were used.

RESULTS

There was no significant difference of characteristics of group I and group II patients with respect to age, operating times, and surgical indication (Table 1, $p > 0.05$).

The microorganisms isolated from the vagina from group I and group II patients belong mostly to the normal microbial flora of the genitalia comprising aerobic and anaerobic *Streptococci, Staphylococcus epiderdimis, Bacteroides* species, *Micrococcus* species, *Proprionibacterium, Corynebacterium,* and *Bacillus* species (Isenberg and D' Amato, 1991) (Tables 2,3)

The effect of povidone-iodine scrubbing significantly reduced the number of positive bacterial cultures from the vaginal discharge before but not after closure of the vaginal cuff ($p < 0.01$ and > 0.05, respectively) (Table 4). During postoperative care, infections by *E. coli* occurred in 2 patients of group I (13%) but none in group II patients (Table 4). The infections were localized in the deep part of vagina. The clinical features in these two patients are shown in Table 5. The isolated organisms from these two patients were *E. coli* resistant to ampicillin used in the prophylaxis as well as to cotrimoxazole. The vaginal infection was severe in one case (Patient No. 11) and mild in the other case (Patient No. 13). The organisms from the severe case were also resistant to kanamycin but susceptible to gentamicin, chloramphenicol and ciprofloxacin, whereas those from the mild case were susceptible to ciprofloxacin, amikacin, and kanamycin but resistant to chloramphenicol and gentamicin. Treatment initially given in these two cases prior to receiving the laboratory result were intrvenous broad spectrum antibiotics comprising ampicillin,

Table 1

Patient' characteristics.

Characteristics	Group I patients (Non-scrubbing group) N = 15	Group II patients (scrubbing group) N = 15	p value (Student's *t* test)
Age (years):	43.1 ± 7.5 (27-58)*	44.1 ± 4.0 (36-58)	> 0.05
Operating time (min):	102 ± 26.1)75-165)	104 ± 22 (75-150)	> 0.05
Surgical Indication:			
- Myoma uteri	13 (86%)	14 (93%)	
- Adenomyosis	2 (13%)	1 (6%)	

*Mean ± SD (range)

Table 2

Organisms isolated from vaginal cuff of group I patients.

Patient	Before closure of vaginal cuff	After closure of vaginal cuff
1	*Bacteroides* species	*Bacteroides* species
2	Streptococci	No growth
3	No growth	No growth
4	Enterococci	Streptococci gr B
5	*Bacteroides* species	No growth
6	*Micrococcus* species	No growth
7	No growth	No growth
8	*Proprionibacterium* species	No growth
9	*Bacillus* species	No growth
10	*Peptostreptococcus* species	No growth
11*	*Micrococcus* species	*Micrococcus* species
12	*Streptococci* gr B	Streptococci gr B
13*	*Morganella morganii*	Streptococci gr B
14	No growth	Enterococci
15	No growth	No growth

*Infected cases

Table 3

Organisms isolated from vaginal cuff of group II patients.

Patient	Before closure of vaginal cuff	After closure of vaginal cuff
1-8	No growth	No growth
9	*Micrococcus* species	*Staphylococcus epidermidis*
10-13	No growth	No growth
14	*Corynebacterium* species	*Micrococcus* species
15	*Escherichia coli*	No growth

Table 4

Total number of positive cultures and postoperative infection patients in the two groups.

	Group I patients (Non-scrubbing group) No. (%)	Group II patients (scrubbing group) No. (%)	p value (Fisher's) exact test)
Before closure of vaginal cuff	11 (73)	3 (20)	< 0.01
After closure of vaginal cuff	5 (33)	2 (13)	> 0.05
Postoperative infections	2 (13)	0 (0)	> 0.05

Table 5

Clinical findings in 2 group 1 patients with postoperative infections.

Clinical findings	Patient No. 11	Patient No. 13
Fever	yes, (38°C)	yes, (38.9°C)
Site of infection	vaginal cuff	vaginal cuff
Leukocytosis (No. of leucocytes/ml)	13,800	12,400
Urine culture	negative	negative
Organisms isolated from the vaginal cuff	*E. coli*	*E. coli*
Ampicillin resistance	yes	yes
Days of hospitalization	10	7

gentamicin and metronidazole. After receiving of the laboratory report, treatment was switched to ciprofloxacin 250 mg orally twice a day. Both cases were dramatically improved and were discharged in 7 and 10 days, respectively after the operation. In contrast, no signs of clinical infections were observed in all 15 cases of group II. Nevertheless, the observed difference of infection in these two groups in not statistically different ($p > 0.05$) (Table 4).

DISCUSSION

The vagina appears to be a reservior of organisms (Houong and Ahmet, 1991; Kristiansen *et al,* 1990; Kubota *et al,* 1992) leading to postoperative morbidity. Our experience at Chon Buri Hospital showed that 5% of patients had clinically postoperative infections after abdominal hysterectomy, indicating that the pre- and postoperative procedures currently used may be inadequate. Unfortunately, the causative agents were not determined. Additional measures are therefore needed, one of which could be sterilizing of the vaginal canal by antiseptics. Duignan and Lowe (1975) showed that application of povidone-iodine to the vagina had a marked immediate effect on the vaginal flora. Monif *et al* (1980) showed that povidone-iodine treatment not only reduced the vaginal flora but also reduced the endocervical bacteria. Thus additional scrubbing with povidone-iodine was adopted for use in the present study. Such application has been shown by Zakut *et al,* (1987) to reduce postoperative morbidity (Zakut *et al,* 1987; Monif *et al,* 1980).

This study clearly showed that povidone-iodine scrubbing completely eliminated postoperative morbidity in group II patients whereas two patients without scrubbing had infection by ampicillin-resistant *E. coli.* In view of the small sample size used ($N = 30$), this apparent beneficial effect of vaginal scrubbing did not reach statistically significant level ($p > 0.05$). Further study is therefore needed to verify our findings before it could be advocated for routine use in clinical practice. If our finding is subsequently substantiated, this procedure will have some impact in the gynaecological practice. The additional vaginal scrubbing will not only reduce the postoperative infections, but it will also be economical by defraying the cost of antibiotics used in the treatment of ampicillin-resistant micro-organisms as well as reducing days of hospitalization.

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