VAGINAL PREPARATION WITH POVIDONE-IODINE BEFORE ABDOMINAL HYSTERECTOMY

A comparison with antibiotic prophylaxis

H. ZAKUT - M. LOTAN - Y. BRACHA

Department of Obstetrics and Gynecology,
The Sackler Faculty of Medicine, Tel-Aviv University,
The Edith Wolfson Medical Center, Holon 58100 (Israel)

Summary: Two groups of women were prepared before total abdominal hysterectomy. The first by povidone-iodine tampons that remained in the vagina until the end of the operation, the second group by administration of a prophylactic antibiotic.

We found statistically significant decreases both in infectious morbidity and in the percentage of positive cultures from the cervix and vagina, at the time of the operation in the povidone-iodine group as compared with the antibiotic group.

Therefore, it is our impression that prophylactic antibiotic therapy for patients undergoing abdominal hysterectomy should be reserved for the patient with compromised defence mechanisms if it is used at all, and recommend local preparation of the vagina with povidone-iodine as an effective alternative.

INTRODUCTION

Hysterectomy is the most frequently performed operations in gynecological surgery. The most common complication associated with the procedure is operative site infection. Such infection occurs in 40 to 60% of patients and typically takes the form of pelvic cellulitis ([3, 5, 6, 11,12, 16]).

The high incidence of this nosocomial infections is not surprising because the combination of operative tissue injury and the unavoidable wound soiling thorough the disrupted vaginal wall give rise to ideal infection factors. Recently, many investigators have expressed concern about the high incidence of infection and have designed various strategies to reduce infection rates, such as systemic antibiotic prophylaxis ([2, 3, 6, 9, 11, 12, 16, 17, 20]), T-tube suction drainage of the retroperitoneal space ([19]) and topical irrigation of the surgical field with an aerosol antibiotic ([21]).

As noted in a recent review ([11]) results of studies involving preoperative parenteral administration of antibiotics for abdominal hysterectomy are highly variable. This therapeutic approach raises the question not so much whether it can prevent significant health hazards for the risks attached to the systemic use of such agents, that is the emergence of resistant strains in the hospital environment ([11-12]), together with the risk of toxic-allergic reaction for the individual patient.

A possible alternative is offered by the topical preparation of the vagina before hysterectomy with povidone-iodine solution 10% – a complex of iodine with a solublizing macromolecule polyvinyl pyrolidone carrier – comparing this method with our department's routine method using perioperative systemic ampicillin prophylactic treatment.

PATIENTS, MATERIALS AND METHODS

96 patients consecutively admitted for elective abdominal hysterectomy were enrolled in the study and divided into two groups. Patients with cancer diagnosis, post or within antibiotic treatment, with pelvic inflammatory disease whether acute or chronic, pregnancy, or patients known as suffering from allergies to penicillin or povidine-iodine were excluded.

The first group consisted of 51 patients who underwent vaginal and perineal scrubbing with

Table 1. —*Comparison of variables in patients before abdominal hysterectomy; both groups.*

	Group 1 Povidone-iodine (n = 51)	Group 2 Ampicillin (n = 46)
Age (yr.)	47.5	43.4
Operative time (min)	93.	94.
Indication:		
- Myomatous uterus	24	26
- Bleeding fibroids or adenomyosis	15	10
- Post-menopausal bleeding with dysplastic changes	7	5
- Other or combinations of the above	5	4

10% povidone-iodine solution 12 hours before operation and a tampon soaked in 15 cc of 10% povidone-iodine solution left in the vagina till 15 minutes after the operation.

The second group consisted of 45 consecutive patients who had the same operation and received 1 g of sodium ampicillin IM one hour before operation and 1 g every 6 hours thereafter for 48 hours; they received 1 g of sodium ampicillin every 6 hours orally through to the sixth post operative day, i.e. 7 days of antibiotic treatment.

All patients' abdomens were scrubbed before operation using povidine-iodine.

Aerobic and anaerobic vaginal and cervical cultures were obtained on admission and during operation from the cut edge of the vaginal cuff and from the external cervical os. Subsequently when clinical evidence of infection appeared, aerobic and anaerobic cultures were obtained.

The aerobic cultures were inoculated into 5% sheep's blood agar, thanol agar and McConkey's agar. After incubation for 48 hours in a 5% humidified incubator at 37 degrees C, identification of major groups of bacteria was done by standard laboratory methods. Anaerobic cultures were taken and inoculated into 5% sheep's blood agar and into thioglicolate broth. They were incubated, sealed in a carbon dioxide generating system at 37 degrees C for 96 hours. Group identification was made after obtaining pure cultures, confirming anaerobic growth, and after obtaining Gram's stain results.

Patients were classified as morbid if a temperature of 38 °C or greater was measured on two successive occasions 6 hours apart, excluding the first 24 postoperative hours. Clinical evidence of infection in scar, urinary tract infection or pelvic cellulitis were recorded and appropriate cultures were taken.

Times of hospitalization was calculated after operation and was recorded as another index of morbidity.

RESULTS

Table 1 shows that the two groups of patients were the same when compared for age, operating time, and distribution of indications for the operation.

Table 2 compares the preoperative and postoperative cervicovaginal cultures from

Table 2. — *Preoperative and postoperative cervicovaginal positive in two groups.*

	Povidone-iodine group		Ampicillin group	
	before op. & treatment	after op. & treatment	before op. & treatment	after op. & treatment
E. Coli	3	1	2	4
Proteus mirabilis	4	1	2	3
Klebsiella pneumonia	2	2	—	2
Pseudomonas aeruginosa	1	—	—	—
Strep. B	—	1	—	—
Staph. aureus	—	—	—	1
Staph. coag. negative	—	—	2	1
Strep. group D	2	1	2	3
Bacteroides fragilis	1	—	1	—
Candida albicans	2	—	1	—
Total	15/51 (29.4%)	6/51 (11.8%)	10/45 (22.2%)	14/45 (31.1%)

Table 3. — *The cause of morbidity in the two groups and mean days of hospitalization.*

	Povidone-iodine group No.	%	Ampicillin group No.	%
Urinary tract infection:	8/51	15.7 %	15/45	33.3%
symptomatic	(3)	(5.9%)	(7)	(15.5%)
asymptomatic	(5)	(9.8%)	(8)	(17.8%)
Wound infection	3/51	5.9 %	2/45	4.4%
Pelvic infection	1/51	2 %	1/45	2.2%
Fever of unknown origin	2/51	3.9 %	8/45	17.7%
Total	14/51	27.45%	26/45	57.7%
Days of hospitalization	7.0±2.6		7.6±1.4	

the povidone-iodine group and those from the ampicillin group. There was no difference between the culture results from the two groups before treatment (23.5% positive cultures in the povidone-iodine group versus 24.4% positive cultures in the ampicillin group).

There was a statistically significant reduction in the postoperative culture results of the povidone-iodine group compared with the increased postoperative cultures results in the ampicillin prophilaxis group ($P < 0.001$, $\chi^2 = 9.05$).

Fourteen of the povidone-iodine treated patients and 26 of the ampicillin treated patients showed morbidity. To evaluate postoperative morbidity a physical examination and cultures from vaginal cuff, urine, and operative wound were performed.

Table 3 compares the cause of morbidity in the two groups and time of hospitalization in days.

The major difference between the two groups of infected patients is the number or urinary tract infection and fever of unknown origin.

Culture results of patients of both groups in whom infection developed are summarized in Tables 4 and 5.

There were statistically significant decrease ($P < 0.0001$, $\chi^2 = 9.05$) both in infectious morbidity (27.4% vs. 57.7%) and in the percentage of postoperative positive cultures from the cervix in the po-

Table 4. — *Culture results of patients prepared with povidone-iodine.*

	Urinary tract. inf.	Wound inf.	Pelvic inf.	Fever of unknown origin
E. coli	8	1		
Proteus mirabilis	4			
Strep. B hemoliticus			1	
Staph. aureus		1		
Klebsiella pneumonia				1 *
Total	12	2	1	1

* Culture results from the cervix during operation.

Table 5. — *Culture results of the ampicillin group patients.*

	Urinary tract. inf.	Wound inf.	Pelvic inf.	Fever of unknown origin
E. coli	12			1 *
Proteus mirabilis	2			2 *
Klebsiella pneumonia	1	1		
Staph. coag. negative	—	1	1	
Total	15	2	1	3

* Culture results from the cervix during operation.

vidone-iodine group as compared to the ampicillin group. No systemic or local adverse effects were noted with the amount of povidone-iodine solution used.

DISCUSSION

The principal rationale for administration of perioperative antibiotics is the prevention of infections from the vaginal cuff by the pathogenic vaginal flora. The vagina appears to be a major source of organisms causing postoperative morbidity. Up to 29% of patients may have pathogenic organism in the vagina before they undergo gynecological surgery (1). Therefore, hysterectomy must be considered a clean operation in a contaminated field.

There is still a controversy about whether patients undergoing total abdominal hysterectomy benefit from prophylactic antibiotics. A review of the reported series available shows discordants results (2, 3, 6-9, 11-18, 20). Some show a decrease in febrile morbidity (11-13). Other authors show a decrease in wound and pelvic infections compared with a placebo group (8). Ohm and Galask were unable to show a statistically significant reduction of morbidity comparing antibiotic prophylaxis with a placebo group (12), and since infections in patients who received placebo were readily contained by antibiotic treatment, the conclusion was that therapy directed at a specific infection process is probably preferable to a routine use of prophylaxis in patients undergoing total abdominal hysterectomy.

As an alternative to systemic perioperative antibiotics we studied the effect of previous treatment of the vagina with a local antiseptic povidone-iodine before operation.

Duignan and Lowe (4) showed that application of povidone-iodine to the vagina has a very marked immediate effect on the vaginal flora. Monif *et al* (10) show the effectiveness of povidone-iodine not only on the vaginal flora but also to reduce the endocervical bacteria.

A significant reduction in the percentage of positive cultures was found from the cervix and vaginal cuff at the operation time in the povidone-iodine group (—11.8%) compared to an increase from 22.2% before operation to 31.1% intraoperative of positive cultures in the ampicillin group (— < 0.05); this increase can be attributed to the minimal effect, if any, of the prophylactic antibiotic used on the vaginal cuff during the operative trauma and impairment of blood supply.

The reduction in the percentage of positive cultures in the povidone-iodine treated group can explain the statistically significant reduction in infection morbidity —27.45%, in the povidone-iodine group as compared to 57.7% in the ampicillin treated group ($P < 0.001$, $\chi^2 = 9.05$).

There was also slightly (although not significantly) longer hospital stay of the patients from the antibiotic prophylaxis group.

BIBLIOGRAPHY

1) Bonnor J., Bruch L. G., Low R. A.: *Obst. Gyn. Brit. Comwlth., 76*, 850, 1969.
2) Cocks P. S. *et al.*: *Aust. N. Z. J. Obst. Gyn., 21*, 116, 1981.
3) Duff P.: *Obst. Gyn., 60*, 25, 1982.
4) Duignan N. M., Lowe P. A.: *Antimicrob. Chemother., 1*, 117, 1975.
5) George J. W., Ansbacher R., Sterson Wl., Rabey F.: *Obst. Gyn., 45*, 60, 1975.
6) Gonen R., Sharft M.: *Harefuah*, 101 (9), 195.
7) Grossman J. H., Greco T. P., Minkin M. J. *et al.*: *Obst. Gyn., 53*, 537, 1979.
8) Jennings H.: *South. Med. J., 71*, 251, 1978.
9) Karhunen M., Kosbela O., Hannelin M.: *Br. J. Obst. Gyn., 87*, 70, 1980.
10) Monif G. R. G., Thompson G. L., Stephans H. G., Baer H.: *Am. J. Obst. Gyn., 137*, 432, 1980.
11) Ohm M. J., Galask R. P.: *Am. J. Obst. Gyn., 125*, 442, 1976.
12) Ohm M. J., Galask R. P.: *Am. J. Obst. Gyn., 125*, 448, 1976.

13) Phillip S. C., *J. of Antimicrobial Chemotherapy, 10* (suppl. A), 85, 1982.
14) Polk B. F., Tager I. B., Shapira M. *et al.*: *Lancet, 1*, 437, 1980.
15) Roberts J. M., Homeslly H. D.: *Obst. Gyn., 52*, 82, 1978.
16) Rosenheim G. E.: *Am. J. Obst. Gyn., 119*, 335, 1974.
17) Seligman S. A.: *J. Antimicrob. Chemother., 10*, (Suppl A), 81, 1982.
18) Swartz W. H., Tanases F.: *Obst. Gyn., 47*, 665, 1976.
19) Vincelette J. *et al.*: *Can. Med. Assoc. J., 127* (2), 19, 1982.
20) Wright V. C., Lanning N. M., Natale R.: *Can. Med. Assoc. J., 118*, 1395, 1978.

ANALYSIS OF THE URODYNAMIC PARAMETERS IN THE MICTURITIONAL PATHOLOGY OF WOMEN IN OLD AGE

S. VALENTE
Aid of Institute of the Gynecological and Obstetric - University of Padua (Italy)
(Head: Prof. A. Onnis)

Summary: Urinary pathology still arouses interest today most especially among those women who are entering old age and especially in relation to the fact that in this age static pelvic changes and trophism of the uro-genital organs occur with greatest frequency. An analysis is presented here of the urodynamic parameters followed in a group of patients affected by this pathology, compared with a control group.

Key words: female stress incontinence; urodynamics.

In clinical practice today we regularly meet an increasing number of cases of urinary pathology, above all of the micturitional type, correlated more or less with both changes in the pelvic statics and with hormonal deficits.

It is also notable that the prolonging of the average expectation of life, with the profound biological, sociological, occupational and ethical implications deriving from it, has created a phenomenon which, from the socio-economic point of view, involves all the more advanced countries ([1, 2, 3, 4, 5, 6]).

In the Italian population, for example, according to data from ISTAT (Istituto Centrale di Statistica) in 1985, the average life-span in women is estimated at around 77 years. From such objective conditions may be deduced how important a part the climacteric, the menopause and postmenopause play in modern gynecological discipline, a role increasingly dominant because of the new and widespread problems presented ([7, 8]).

In this age the major urological pathology is represented by urinary incontinence, with situations of anatomical changes of various types, such as, for example, cases of anterior prolapse understood as uretrocele, cystocele and uretrocystocele, or cases of uterine prolapse of high degree or of uretrovaginal prolapse ([9, 10, 11]).

Alongside these cases the pathology is often associated with hypoestrogenism