

INTRAVENOUS METRONIDAZOLE PROPHYLAXIS IN HYSTERECTOMY

by

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Postoperative infectious processes occurring in the female pelvis are usually polymicrobial in etiology (Allen *et al* 1972; Ledger *et al* 1973; Thadepalli *et al* 1973) and include both aerobic and anaerobic organisms. The antibiotics that are commonly used in hysterectomy are usually not very effective *in vitro* against anaerobic bacteria, and yet have been successful when employed to prevent postoperative infective morbidity. This might imply that infections caused by anaerobic organisms are dependent upon the presence of aerobic flora, the mechanism of prophylaxis being the reduction of aerobes to preclude infection by anaerobic organisms. Equally effective control of infection is obtained by antibiotics active directly against the anaerobic flora. Propably a reduction in anaerobic flora may reduce infections by aerobic organisms, and as per this hypothesis altering the anaerobic flora should decrease infections. From these observations it appears that the antibiotic of choice for hysterectomy need not

necessarily be a broad-spectrum agent but one that has activity against either anaerobic or aerobic flora (Halmod *et al*, 1980).

Metronidazole, known to be effective *in vitro* against anaerobic bacteria, has been effectively employed in the prophylaxis in abdominal and vaginal hysterectomy (Appelbaum *et al* 1978 and Hamod *et al* 1980). While prophylactic antibiotic therapy in hysterectomy is well recognised, Burke (1961) has shown that prophylactic antibiotics serve no purpose when administered for periods longer than a few hours after the end of active bacterial contamination. This has prompted many authors (Breedon and Mayo, 1973, Ohm and Galask, 1975 and Grosman and Alams, 1979) to use abbreviated courses of antibiotics as successful prophylactic therapy.

Our objective is to determine the role of prophylactic antibiotic therapy with short-term administration of intravenous Metronidazole in abdominal and vaginal hysterectomy. We have compared the postoperative outcome with that of our earlier series of vaginal hysterectomy receiving the conventional broad-spectrum antibiotic therapy over a period of 6 to 7 days.

Materials and Methods

The study population consisted of 201 patients, aged between 26 and 62 years,

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Accepted for publication on 17-8-82.

undergoing vaginal or abdominal hysterectomy for different indications (Table I). All the patients undergoing hysterectomy in the unit from October, 1981 were enrolled for the study, and the study was completed over a period of 9 months.

TABLE I
Indications for Hysterectomy
N = 201

Uterine prolapse	77
Cervical dystrophies	55
Uterine fibroids	16
Ovarian tumour	14
Functional uterine Hge	32
Carcinoma in Situ Cx	2
Tubo ovarian mass	1
Ectopic pregnancy	1
Vesicular mole	1
Carcinoma endometrium	2

The antibiotic schedule was as follows: Metronidazole was administered in a dose of 1 gm (2 bottles of 500 mg each) intravenously in the evening on the day prior to operation, followed by another 1 gm given intravenously immediately following the surgery. Thus, during a span of 24 hours, in and around the period of operation, the patient received 2 gms of metronidazole administered intravenously.

The postoperative care was routine which included early ambulation, oral feeds from the next post-operative day, no continuous bladder drainage, and enema on the 3rd day. No subsequent antibiotic therapy was administered unless indicated by the patient's condition. Vitamin B-complex and vitamin C were administered orally from the 2nd day for all patients till the time they were discharged from the hospital. Usual length of hospital stay was 6 days for vaginal hysterectomy and 7 days for abdominal hysterectomy.

The length of hospital stay, standard febrile morbidity and incidence of post-

operative pelvic infections and need for supplementary antibiotics were determined for all the patients. In this paper febrile morbidity is defined as a temperature of 100°F or greater, on two consecutive days, excluding the first 48 hours of operation.

Observations

The mean age of the 201 patients was 40.12 years, and among them 76 underwent vaginal hysterectomy (37.80%) 77 vaginal hysterectomy with plastic repair (38.30%), and 48 abdominal hysterectomy (23.90%).

Following the surgery 174 patients (86.60%) had a comfortable postoperative period with no febrile morbidity or other complications and were discharged on the 6th or 7th day with none of them requiring readmission for any ailment. Among the remaining 27 patients (13.40%) with minor or major complications, 14 (7.00%) had only febrile morbidity (of whom 3 required antibiotic supplementation) which did not prolong their hospital stay nor were there any associated complications. Thus, altogether 188 patients (93.60%) had the shortest hospital stay of 6 to 7 days and were free of complications after discharge, with 3 patients in this group getting antibiotic supplementation during the hospital stay.

Considering the remaining 13 (6.40%) patients who had some form of complication requiring further treatment, 4 (2.00%) had postoperative bleeding (in the form of secondary haemorrhage or haematoma)—complications directly related to surgery, particularly the vaginal procedures, which had no relation to the prophylactic antibiotic therapy (Table II). The other form of major complication was pelvic sepsis detected and treated in 9 patients (4.40%) (Table III).

TABLE II
Complications of Hysterectomy

Complications	No.	%
Haemorrhage	4	2.00
Pelvic infection	9	4.40
Febrile morbidity requiring antibiotic supplementation	3	1.49
Prolonged hospital stay	10	4.98
Patients who had no complications	188	93.60

TABLE III
Pelvic Infections in 9 Patients

Vault sepsis	3
Pelvic cellulitis	3
Pelvic abscess	1
Pelvic peritonitis	1
Stitch abscess	1

All these 13 patients had either a prolonged post-operative stay or had to be re-admitted, and invariably required antibiotic supplementation. Only in 4 patients the antibiotic supplementation was by additional dose of I.V. metronidazole, and the remaining subjects received other forms of antibiotics. In addition to antibiotic supplementation, the pelvic infection group was treated by repeated vaginal examination to facilitate the drainage of infected collections. Among those with pelvic infection only 2 patients had serious infection in the form of pelvic abscess in 1 patient and pelvic peritonitis in the other. The former was treated by colpotomy drainage and the latter by conservative approach.

Discussion

In our present study, where 201 patients undergoing vaginal or abdominal hysterectomy were treated with prophylactic dose of intravenous metrogyl (2 gms) adminis-

tered around the period of operation, 86.60% were totally free of complications and had the normal length of hospital stay of 6 to 7 days. Another 14 had febrile morbidity with some requiring antibiotic supplementation. However they did not have to stay longer in the hospital nor had any form of complications afterwards. Among the 6.4% of patients with significant complications, excluding the 2% had postoperative haemorrhage while 4.4% had developed obvious pelvic sepsis requiring additional antibiotic therapy.

When the 9 women with postoperative sepsis and the 3 women who had only febrile morbidity but required further antibiotic therapy were considered together, there were 12 patients (5.97%) with febrile morbidity requiring antibiotic supplementation and other treatments. If all the causes for prolonged hospital stay or re-admission were put together there were 10 patients (4.98%) who had overstayed for one reason or other. Except 2 patients who had pelvic peritonitis or pelvic abscess there were no serious infective complications in this group. Post-operative bleeding occurring in 4 subjects could be effectively managed, even though their hospital stay was prolonged by 7 to 8 days more. When all the complications were excluded it could be seen 93.6% had a smooth uneventful post-operative period and were free of complications.

In view of these observations, prophylactic intravenous administration of Metronidazole can be considered a clinically acceptable form of antibiotic therapy for patients undergoing abdominal or vaginal hysterectomy. Simplicity of administration, short period of treatment, minimal dosage, absence of any side effects and the clinically acceptable effectiveness in controlling pelvic sepsis are the factors recommending the regular use of

intravenous metronidazole for prophylaxis in hysterectomy. The biological half life of metronidazole in the serum of human female subjects was found to be 7.3 hours (Wood and Menro, 1975), and therefore our way of administration of 1 gm I.V. on the previous evening, and another 1 gm I.V. immediately after the operation will maintain the optimum blood level around the period of active bacterial contamination.

While metronidazole therapy as suggested by us, is effective in the prophylaxis and possibly in the treatment of anaerobic infections associated with abdominal or vaginal hysterectomy, it is doubtful whether this form of therapy is a better alternative to the conventional form of post-operative management with the broad spectrum antibiotics. We had determined the postoperative complications in our previous series of 396 vaginal hysterectomies performed by the first author, wherein tetracyclines were administered in a dose of 250 mg every 6 hours for 6 days. Oral administration was preferred in all subjects on all days excepting the first day. Febrile morbidity necessitating change of antibiotics or other forms of treatment was encountered in 3.81% and the postoperative hospital stay was prolonged in 7.44%. Haemorrhagic complications were more in this series because this group included hysterectomies performed for enlarged uteri and adnexal masses. Even then, after excluding all those who had complications, 93.50% has a smooth and uneventful postoperative period (Rajan *et al* 1982).

Eventhough the two study groups are not comparable for all parameters the post-operative sepsis rate is certainly more in the present series. Hence we feel that

prophylactic intravenous metronidazole therapy is not superior to the conventional broad spectrum antibiotic treatment of patients undergoing hysterectomy. Nonetheless, it is an alternative clinically acceptable approach.

Conclusion

In this study we have adequately demonstrated that prophylactic administration of 2 gms of metronidazole intravenously in and around the period of hysterectomy is adequate antibiotic protection to preclude significant pelvic infection. Eventhough this treatment schedule is clinically acceptable and there are many factors recommending this form of prophylactic therapy for hysterectomy patients, its superiority over the conventional antibiotic therapy could not be established by our study.

Acknowledgement

We are grateful to the Medical Superintendent for his kind permission to analyse the Hospital records.

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