PREVENTION OF INJECTION AFTER PELVIC AND ABDOMINAL SURGERY WITH A PRE-OPERATIVE ORAL DOSE OF TINIDAZOLE OR METRONIDAZOLE

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ABSTRACT

Anaerobes are involved in most infections following pelvic and abdominal surgery. Therefore, perioperative prophylaxis with intravenous metronidazole, ampicillin, and gestamicin has become a common practice. This requires an IV line and entails the risk of thrombophlebitis. Hence the efficacy of a pre-operative, 2g oral dose of metronidazole or tinidazole was investigated in a multicenter study on 1,035 patients undergoing elective pelvic or abdominal surgery, forming two well-matched groups. The oral dose of test drugs was given 12 hours before the procedure. The incidence of wound and intra-abdominal infection, respectively, was : metronidazole, 12.1% and 4.6%; tinidazole, 4.3% and 1.5% ($P < 0.01$). A 2g oral dose of tinidazole, given 12 hours beforeelective pelvic or abdominal surgery, is effective, convenient, and economical for reducing the incidence of subsequent infection and avoids the need for prophylactic intravenous netronidazole.

INTRODUCTION

Proper asepsis, effective hemostasis, and minimal tissue trauma are the keystones for preventing post-operative infection. However, these may not be adequate for preventing endogenous infection when infected or contaminated hollow viscera are opened during the procedure, eg. in gynecologic and intestinal surgery. Antimicrobial perioperative prophylaxis can provide an effective barrier against this factor. Since most of these infections are caused by mixed aerobic and anacrobic flora, (Kaiser 1986) the use of intravenous metronidazole with other antibiotics, usually ampicillin and gentamicin, is a common practice. However, a 2g dose of tinidazole, given orally 12 hours before surgery has also been recommended for such prophylactic De.B. and Misra M.G.(1983) Cocks etal (1981) As it could be a convenient and economical alternative, this study was organized to test its effectiveness.

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PATIENTS AND METHODS

Initially, a pilot study was done by the author on 40 patients, who underwent elective pelvic surgery, to test the effectiveness and tolerability of a 2g dose of metronidazole or tinidazole given 12 hours before the procedure. It suggested that this dosage could be effective and well tolerated. Subsequently, to have the large number of patients (900 or more) recommended for a proper study of this nature,1 and to obtain a representative sample of such patients, 150 gynecologists and surgeons from all over the country were requested to enrol up to 10 patients each for elective pelvic or abdominal surgery. After obtaining their informed consent, the patients were given a 2g oral dose of either metronidazole (M) or tinidazole (T), by random order, 12 hours prior to the operation. Thus, each participant used both the drugs and followed a common protocol. Ampicillin (A) and/or gentamicin (G), if used routinely by the participant, were also given and recorded. Clindamycin or Chloramphenicol were not used.

Besides demographic data, the nature of operation, anaesthesia, and other antibiotics given were noted. Wound were classified according to the criteria of American National Research Council, as described by Krukowski et al. Patients were observed for 7 days for evidence of infection, viz. purulent discharge from wound and clinical evidence of intra-abdominal infection. The data were analysed by Chi-square test, Wilcoxon's rank test, or Student's t-test as appropriate.

RESULTS

Of 1,153 Patients enrolled (M 564, T 589), 118 had to be excluded (M 61, T, 57) for protocol violations. The 1,305 evaluable patients (M 503, T 532) formed two groups that were comparable in mean age (M 36+2, T 38+2), sex distribution, type of anaesthesia, and nature of operation. The commonest procedures were hysterectomy, followed by appendicectomy and cholecystectomy. A majority of the woulds were clean/contaminated (M 86%, T 80%), ie. involved the opening of a hollow viscus with minimal spillage of its contents into the peritoneal cavity. Besides the test drugs, 74% of patients in each group received ampicillin and/or gentamicin, but 26% did not.

The incidence of wound infection and intra-abdominal infection in the two groups was: M, 12.1% and 4.6^; T 4.5% (P ,0.01 for both). The trend was similar even when analyzed separately for patients receiving or not receiving A+G concomitantly.

The incidence of nausea (M 9.9%, T 4,5%) and vomiting (M 8.6%, T 1.7%) was less with tinidazole ($P < 0.01$).

DISCUSSION

To be effective in preventing post-operative infection, an antimicrobial must be present in the tissues in adequatw concentration at the time of operation. Kaiser A-B 1986 Further, it must be effective against most, it not all, of the likely pathogens so as to break the synergy between aerobes and anaerobes. Ledger W.J. 1986 Currently the commonest practice is to be use intravenous metronidazole with ampicillin and/or gentamicin for prophylaxis. This requires an intravenous line, Which sometimes leads to thrombophlebitis, and also increases the cost of therapy, though intra-operative findings such as a tubo-ovarian abscess would necessitate it. However, in a majority of clean or clean/contaminated cases, oral prophylactic therapy can be adequate. The efficacy of an oral 2G dose of tinidazole, given 12 hours before surgery, was reported by De & Misra 1983. A recent study by Mishra et al has also shown that such a dose improves the efficacy of ampicillin and/or gentamicin. The results of our study confirm these earlier findings.

Metronidazole and tinidazole have the same spectrum and activity against anaerobes. Carmine etal 1982 an oral 2g dose of tinidazole seems preferable in view of its longer half-life

and mouro 1974 and higher lipid solubility Jokipli 1977 as compared with metronidazole. Given orally 12 hours before operation, either alone or with ampicillin/gentamicin, this dose appears to be an effective adjunct to the basic tenets of surgery, viz, asepsis, hemostasis, and minimal tissue injury, in preventing infection and morbidity after elective pelvic and abdominal operations.

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REFERENCES

1. *Kaiser AB N Eng J Med 1986 315:1129;*
2. *De B, Misra MG. J, Obstet, Gynec Ind 1983 23:541;*
4. *Cocks PS, Munro R, Norton B, Nutting J, Shanker S, Cheng S. Aust N.Z.J, Obstet, Gynec. 1981 21:116;*
5. *Krukowski ZH, Stewart MPM, Alsayer HM, Matheson NA. Brit. Med. J. 288:278-1984.*
6. *Ledger WJ. Infection in the Female, 2nd ed. Philadelphia: Lea & Febiger, 1986 96;*
7. *Mishra MK, Nanviadekar AS, Gadgil SD, Kulkarni SS, Nambi S. Ind.J. Surg (under publication)*
8. *Carmine AA, Brogden Rn, Heel RC, Speight TM, Avery GS.*
9. *Monro AM. Curr Med Res Opin 1974: 2:130-137.*
10. *Jokipii AMM. Myllyla VV, Hokkanen E, Jokipii L. J Antimicrobial Chemother 1977; 3:239;.*