

Role of Augmentin as a prophylactic antibiotic in Gynaec major Surgery

Mohinderjeet K. Brar, Jaswinder, Hardeep Kaur

Dept. of Obst. and Gyn. S.G.T.B. Hospital / Govt. Medical College, Amritsar

Summary : 25 cases of major gynaecological surgery were included in Group I. These were given Inj. Augmentin 1.2 gm slow I.V. 30 minutes to one hour prior to making the surgical incision and repeated 8 hours and 16 hours after the first injection. Cases who had an indwelling catheter overnight (vaginal surgery) were given additional two doses of Augmentin post-operatively 8 hours apart. Group II included 25 cases who were given Ampicillin 500 mg 6 hourly after test dose and Gentamycin 80 mg B.D.I.M. for 7 days starting post-operatively.

Incidence of wound induration and vaginal discharge in group I and II respectively was nil versus 28% and nil versus 8%. Febrile morbidity was nil versus 16%. Incidence of UTI, secondary haemorrhage, adverse reactions and thrombophlebitis in group I and II was, 12% versus 20%, 4% versus 16% and nil versus 4%. Augmentin prophylaxis is safe, effective, convenient and saves manpower thus preventing irregularity in administering drugs and can easily replace the 7 day extended use of drugs.

Introduction:

Infection is the most common complication of surgery. Cause of infection could be direct invasion of damaged tissue by organisms harboured by the patient or due to cross infection in the wards from other patients, or due to faulty aseptic technique. In spite of good operative techniques and complete asepsis in the wards and operation theatre, post-operative infections do occur complicating healing. Use of prophylactic antibiotics in the pre-operative and post-operative period have been documented to be of considerable value in reducing the incidence of wound infection. However for prophylaxis to be successful the antibiotic has not only to be effective against anticipated bacterial contaminants but must be present in the circulating blood and the tissues at the time of contamination.

Intravenous augmentin (amoxicillin and clavulinic acid in the ratio of 5:1) is being used with increasing frequency as a single broad spectrum agent against both aerobic and anaerobic organisms compared to betalactam antibiotics which are becoming increasingly susceptible to degradation by betalactamase enzymes.

Brown et al (1988), have also reported less infective morbidity following augmentin prophylaxis than after

metronidazole for hysterectomy. Clavulinic acid which has weak antibacterial activity, progressively and irreversibly binds and inactivates most betalactamases. Thus clavulinic acid protects amoxicillin from inactivation (Charmas et al. 1978) and extends the antibacterial spectrum of activity to include anaerobes.

Aims and Objectives

1. To assess the effectiveness of augmentin in controlling infection.
2. To reduce the total requirement of antibiotics in major surgery cases, thus reducing the cost of treatment.
3. To compare it with ampicillin and gentamycin combination which is being used presently for 7 days postoperatively

Material and Methods

The study was carried out in the department of Obstetrics and Gynaecology S.G.T.B. Hospital Medical College Amritsar. Fifty cases fit for surgery and anaesthesia for elective gynaec major surgery were included in the study. Cases with diabetes, steroid therapy, endocrine disorders, leucocytosis and other factors predisposing the patient to infection were excluded. The cases were divided into two groups.

Group I (Study group)

Comprised of 25 cases who were given augmentin 1.2 gm (Amoxicillin and Clavulanic acid) slow I/V 30 minutes to one hour prior to surgical incision and repeated 8 hours and sixteen hours after first injection. Cases who had indwelling catheter overnight (vaginal surgery) were given additional two doses of augmentin post-operatively 8 hours apart.

Group II (Control group)

Also comprised of 25 cases who were given ampicillin 500 mg 6 hourly after test dose intramuscularly/orally and gentamycin 80 mg b.d. intramuscularly for 7 days starting post-operatively. Post-operative outcome in these two groups was compared by noting temperature, wound status, complications and any adverse effects.

Observations

The age of the patients in the study group was in the range of 20-70 years, is compared to 29-60 years for those in the control group. Table I shows the type of surgery performed. Table II compares the post-operative complications in the two groups. No adverse reaction was noted in group I while 2(8%) patients in group II had diarrhoea, ampicillin was omitted and in thrombophlebitis symptomatic treatment was given. In the study group, getting intravenous augmentin, culture and sensitivity was

not done since the infection encountered in both the cases was of grade I only and there was no wound discharge/pus. Therefore, no additional antibiotic was added. The grade I infection present in these cases was self controlled. As shown in table - III, incidence of wound infection was 28% in control group and antibiotics were changed according to sensitivity report after omitting the ampicillin. In group I, 3(12%) cases had burning micturition and in all the three cases growth of E.coli were obtained sensitive to augmentin. So augmentin was given orally and continued for 5-7 days. No additional antibiotic was used. In group II, urine culture and sensitivity report of 8 patients revealed growth of E.coli in 5 cases (20%), Klebsiella in 2 cases (8%) and proteus in one case (1%). Antibiotics were changed and started according to the sensitivity report.

In group I, none of the cases had abnormal vaginal discharge, whereas in group II, 2 cases had foul smelling vaginal discharge and in both growth of E.coli was found and antibiotics were changed according to sensitivity. Augmentin prophylaxis is safe, effective, convenient and saves manpower thus preventing irregularity in administering drugs and can easily replace the 7 days extended use of drugs.

Discussion

Gynaecological procedures like hysterectomies with their proximity to vagina, which is a reservoir of potential

Table I
Type of Gynaec Surgery

| Operation | Study group (n=25) | | Control group (n=25) | |
|----------------------------------|-------------------------|------|-------------------------|------|
| | (age range 20-70 years) | | (age range 20-60 years) | |
| | No. of cases | %age | No. of cases | %age |
| Abdominal hysterectomy | 10 | 40 | 13 | 52 |
| Vaginal hysterectomy | 00 | 00 | 02 | 08 |
| Vaginal hysterectomy with repair | 03 | 12 | 02 | 08 |
| Manchester operation | 05 | 20 | 00 | 00 |
| Pelvic floor repair | 04 | 16 | 04 | 16 |
| Recanalization | 02 | 08 | 02 | 08 |
| Ovarian cystectomy | 01 | 04 | 02 | 08 |

Table II
Observations in two groups

| Nature of complication | Group I | | Group II | |
|----------------------------|--------------|------|----------------|------|
| | No. of cases | %age | No. of cases | %age |
| Wound induration | 02 | 08 | 07 | 28 |
| Temperature | 00 | 00 | 04 | 16 |
| Cough | 01 | 04 | 01 | 04 |
| Burning micturition | 03 | 12 | 08 | 32 |
| Abnormal vaginal discharge | 00 | 00 | 02 | 08 |
| Secondary haemorrhage | 01 | 04 | 04 | 16 |
| Mortality | 00 | 00 | 00 | 00 |
| Adverse reactions | 00 | 00 | 02 (diarrhoea) | 08 |
| Thrombophlebitis | 00 | 00 | 01 | 04 |

Table-III
Bacteria cultured from Wound Discharge, Urine and Vaginal Swab on Culture Sensitivity

| Organisms cultured | Study Group | | | Control Group | | |
|--------------------|-----------------|---------|--------------|-----------------|--------|--------------|
| | No. of cases of | | | No. of cases of | | |
| | Wound discharge | Urine | Vaginal Swab | Wound discharge | Urine | Vaginal swab |
| E.coli | - | 3 (12%) | - | 2(8%) | 5(20%) | 2(8%) |
| Staph Aureus | - | - | - | 3(12%) | - | - |
| Klebsiella species | - | - | - | 1(4%) | 2(8%) | - |
| Proteus | - | - | - | 1(4%) | 1(4%) | - |

pathogens, carry significant risk of infectious morbidity. Burke (1961), gave antibiotics prophylaxis on scientific basis when he demonstrated in animal studies that timely administration of synthetic penicillin could markedly reduce the effects of intradermal inoculation of staphylococcus aureus. Since then there have been many studies investigating the use of a variety of agents in the antibiotic prophylaxis for different surgical procedures. There is now good evidence that single dose prophylaxis given just before surgery confers as much protection against postoperative sepsis as do more prolonged courses.

Hensell et al (1987), summarised the benefits of single dose therapy as follows (1) less expensive (2) less likely to encourage development of resistant bacteria (3) uses less nursing and pharmacy resources (4) less likely to

cause toxicity and allergic reactions. Extended courses can be kept for cases requiring prolonged surgical procedures and in those having catheterisation done post-operatively.

Cartwright et al (1984), stated that operative site infection rate following vaginal hysterectomy group fell from 30-40% to 1-10% on average, whereas following abdominal hysterectomy less than 1/3rd of 16 studies demonstrated a decrease in pelvic cellulitis and wound infection, although febrile morbidity and U.T.I. were reduced by half.

Different antibiotics have been used for prophylaxis. To overcome aerobes and anaerobes, cephalosporins and penicillins have been used in combination with metronidazole and more recently augmentin with

increased beta lactamase aerobic gram positive cocci and anaerobic bacilli. Brown et al (1988), showed significantly less infective morbidity following augmentin prophylaxis than after metronidazole for hysterectomy.

In the present study short course of prophylactic single antibiotic, augmentin has been documented to be more effective in controlling tissue inflammatory response when started preoperatively as compared to traditional use of extended two drug combinations (Ampicillin and Gentamycin) post-operatively.

The introduction of betalactamase is a problem more common with use of second and third generation cephalosporins and is produced by many gram positive and negative organisms. It is now the most common mechanism of bacterial resistance and induction of such enzyme would present considerable difficulties in the treatment of post prophylaxis infection. Augmentin which contains clavulanic acid an irreversible

beta lactamase inhibitor along with amoxycillin, is a valuable therapeutic option for surgical prophylaxis.

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