

Pattern of Use of Antibiotic Prophylaxis in Caesarean Section and Hysterectomy

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Abstract

Aim: The aim of the present study was to evaluate the choice of antibiotics in caesarean section and hysterectomy. **Methods:** The present study was conducted at hospital, A Data were collected retrospectively from patients' medical records. The subjects were all patients in the obstetrics and gynecology department who underwent caesarean section and hysterectomy.

Results: The mean age of participants was 25 years. Most of the subjects in the study group belonged to upper lower socioeconomic status by modified Kuppuswami scale. Most of the women were second gravida. The study involved 100 women who underwent Hysterectomy and Cesarean Section. Overall, 100 of the 93 patients were given prophylactic antibiotics. The most commonly used antibiotics are ceftriaxone and ceftazidime. Around 70% women received the prophylactic antibiotic in the prescribed timing of 30-60 minutes before the skin incision. The only factor found associated with patient not receiving antibiotics within the prescribed time limit was delay during shifting of patient and availability of operation theatre.

Conclusion: This retrospective study reveals that the most widely prescribed antibiotic prophylactic was ceftriaxone and ceftazidime instead of first-generation cephalosporin. On quantitative measurement, the highest antibiotic used was ceftriaxone followed by ceftazidime and cefotaxime.

Keywords: hysterectomy, caesarean section, antibiotics

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Introduction

Bacterial infections around the time of childbirth are among the leading causes of maternal mortality worldwide and account for about one-tenth of the global burden of maternal death. [1,2] Several factors have been associated with increased risk of maternal peripartum infections, including pre-existing maternal conditions and conditions during labour and childbirth. Caesarean section is the most important risk factor for maternal infection in the immediate postpartum period. [3] One of the main strategies to prevent post-caesarean infections includes use of prophylactic antibiotics. [4] The WHO guideline panel made strong recommendations regarding the administration of prophylactic antibiotics 30-60 minutes before skin incision for women undergoing elective or emergency caesarean section. [5]

Many studies have been published in recent years stressing the need for antimicrobial prophylaxis in hysterectomy. Women undergoing elective cesarean section are considered low risk population. [6,7]

Although serious infectious complications are uncommon in this group, a literature survey demonstrated that prophylactic antibiotics significantly reduced the risk of endometritis and wound infection. [8,9] Hysterectomy is performed through a contaminated field and it is the mixed aerobic / anaerobic bacterial flora of the lower genital tract that serves as a reservoir for most of the pathogens associated with postoperative sepsis. The use of prophylactic antibiotics in hysterectomy and cesarean section in our hospital is not standardized and is determined by the consultant in charge of the case. The most commonly used regimen is to give three doses of cefazolin intravenously.

Evidence suggests that a single dose of first-generation cephalosporin or penicillin should be used in preference to other classes of antibiotics, particularly because these are broad spectrum antibiotics and widely available in all settings. However, the global use of prophylactic antibiotics for caesarean births varies largely between hospitals,

in part because of lack of institutional protocols and uncertainties about the antibiotic regimen of choice and correct timing of administration.

The aim of the present study was to evaluate the choice of antibiotics in caesarean section and hysterectomy.

Materials and Methods

The present study was conducted at hospital , Anugrah Narayan Magadh Medical College and Hospital, Gaya Bihar, India for one year. Data were collected retrospectively from patients' medical records. The subjects were all patients in the obstetrics and gynecology department who underwent caesarean section and hysterectomy. The study involved 100 women who underwent Hysterectomy and Cesarean Section.

Data analysis was carried out quantitatively using the ATC/DDD method, namely a drug classification system based on ATC (Anatomical Therapeutic Chemical). The use of the ATC (Anatomical Therapeutic Chemical) method will classify drugs based on therapeutic purposes, pharmacology, and chemical structure of drugs. DDD (Defined Daily Dose) is the assumption of the average maintenance dose per day in adult patients with certain

indications. Measurement of drug use using Defined Daily Dose based on guidelines issued by the WHO Collaborating Center for Drug Statistics Methodology with units of DDD/100 patients/day. The ATC code and standard antibiotic DDD (grams) from the World Health Organization (WHO) index are recorded, then the number of antibiotics used by the patient (grams) is calculated which is obtained from calculating the dose multiplied by the number antibiotic unit. Then calculated the number of Length of Stay (LOS) obtained from the total days of care for each patient. From these data, a description of the use of antibiotics is calculated using DDD/100 patient-days units by dividing the number of grams of antibiotics used by the patient per WHO standard DDD multiplied by 100 per total LOS.

Qualitative analysis was carried out by assessing the selection of antibiotics based on the guidelines of The American College of Obstetricians and Gynecologists (ACOG): Antibiotic Prophylaxis for Gynecologic Procedures and The American Society of Health-System Pharmacists (ASHP): Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery.

Results

Table 1: Demographic and clinical details

| | |
|----------------------------|------------|
| Age (years) | 25.68±2.56 |
| Socioeconomic class | |
| Lower | 26 |
| Upper lower | 53 |
| Lower middle | 13 |
| Upper middle | 8 |
| Upper | 0 |
| Parity | |
| Primigravida | 35 |
| 2 nd gravida | 45 |
| 3 rd gravida | 17 |
| >3 rd gravid | 3 |

The mean age of participants was 25 years. Most of the subjects in the study group belonged to upper lower socioeconomic status by modified Kuppusswami scale. Most of the women were second gravida.

Table 2: Number of patients over the 6 months

| No. of patient | With antibiotic (%) | Without antibiotic (%) |
|-------------------|---------------------|------------------------|
| 100 patients | 93 patients (93) | 7 patients (7) |
| Procedures | | |
| Hysterectomy | 35 patients (35) | |
| Caesarean Section | 58 patients (58) | 7 patients (7) |

The study involved 100 women who underwent Hysterectomy and Cesarean Section. Overall, 100 of the 93 patients were given prophylactic antibiotics.

Table 3: Number of patients who attained antibiotic prophylactic in Caesarean Section and Hysterectomy procedure

| Procedure | Antibiotics | | | | Total |
|------------------|-------------|-------------|------------|-----------|-------|
| | Ceftriaxone | Ceftazidime | Cefotaxime | Cefazolin | |
| Hysterectomy | 20 | 10 | 4 | 1 | 35 |
| Cesarean Section | 21 | 24 | 12 | 1 | 58 |

The most commonly used antibiotics are ceftriaxone and ceftazidime.

Table 4: Pattern of antibiotic usage

| Timing of prophylactic antibiotic | |
|---|-----|
| Within 30-60 mins of skin incision | 70% |
| More than 60 mins before skin incision | 30% |
| Duration of antibiotic usage in post-operative period | |
| Less than 48 hours | 82% |
| 48-72 hours | 10% |
| More than 72 hours | 8% |
| Combination of antibiotics used | |
| Regimen 1: Injection monocef 1 gm IV BD Injection gentamycin 80 mg IV BD Injection metronidazole 100 cc IV TDS | 90% |
| Regimen 2: Injection ampicillin 500 mg IV QID Injection gentamycin 80 mg IV BD Injection metronidazole 100 CC IV TDS | 10% |

Around 70% women received the prophylactic antibiotic in the prescribed timing of 30-60 minutes before the skin incision. The only factor found associated with patient not receiving antibiotics within the prescribed time limit was delay during shifting of patient and availability of operation theatre.

Discussion

Suitable of antibiotic prophylactic have presented to be fairly effective in diminishing the occurrence of Surgical Site Infections (SSIs). [10] Antibiotic prophylaxis is aimed to drop amount of bacteria contamination which are cause infections during surgery. [11] However, inappropriate use of prophylactic antibiotics will lead to an increase in the rate of antibiotic resistance [12] and ultimately SSI. [10] The international guidelines recommend a single dose of antibiotics and there are not enough guidelines for antibiotic usage in developing countries like India. [13]

The mean age of participants was 25 years. Most of the subjects in the study group belonged to upper lower socioeconomic status by modified Kuppuswami scale. Most of the women were second gravida. The study involved 100 women who underwent Hysterectomy and Cesarean Section. Overall, 100 of the 93 patients were given prophylactic antibiotics. The most commonly used antibiotics are ceftriaxone and ceftazidime. On Cochrane's study which involved more than 13,000

mothers resulted antibiotic prophylaxis reduced occurrence of endometritis, complication of serious maternal infection, wound infection and fever on mother who undergoing obstetrics and gynecology procedures. [8]

Around 70% women received the prophylactic antibiotic in the prescribed timing of 30-60 minutes before the skin incision. The only factor found associated with patient not receiving antibiotics within the prescribed time limit was delay during shifting of patient and availability of operation theatre. The most frequent microbes isolated from endometrial cultures of women with post-caesarean wound infections are staphylococci, enterococci, anaerobes and ureaplasmas. [14] Furthermore, when specifically identified, urea plasma (or Mycoplasma genus) is the most common organism isolated from the amniotic fluid and chorioamnion at caesarean delivery, and is associated with a 3- to 8-fold increased risk of post-caesarean endometritis or wound infection. [15,16] Bacterial vaginosis is also associated with an increased risk of post-caesarean endometritis. Therefore, the recommended regimen of ceftriaxone alone does not cover frequent isolates or risk factors of such infection. The use of first-generation cephalosporins such as cefazolin provides antibiotic activity against species of Urea plasma and Mycoplasma but may cause an increase in resistant organisms like anaerobes. Hence, there is a rationale for adding agents such as

metronidazole, clindamycin or azithromycin to extend the cover.

Recently, another aspect of prophylaxis is to shorten the duration of antibiotic use. For most hysterectomies, a single dose of antibiotic is sufficient.¹⁶ Current information suggests that additional dose should be given at intervals of twice the half-life of the antibiotic to maintain adequate levels throughout the procedure. [17]

Conclusion

Antibiotic prophylaxis is a pace to prevent post-operative infection and also to diminish bacteria resistant. Before using antibiotic prophylaxis, we should consider and concern of its risks and benefits covering level of bacterial resistance, infection-causing bacteria, timing and antibiotic spectrum. This retrospective study reveals that the most widely prescribed antibiotic prophylactic was ceftriaxone and ceftazidime instead of first-generation cephalosporin. On quantitative measurement, the highest antibiotic used was ceftriaxone followed by ceftazidime and cefotaxime.

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