An analysis of wound infection following Total abdominal hysterectomy

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Abstract:
Objective of this study is to find the incidence of postoperative wound infection following Total abdominal hysterectomy, risk factors involved, type of infection, organism causing infection, Antibiotic sensitivity resistance. All women undergoing TAH (Total abdominal hysterectomy) during JAN 2011 TO SEPT 2011 were followed up. Women who develop wound infection are observed, wound culture taken and antibiotic sensitivity found. Obtained data s were analysed to find the incidence, type of infection, organism causing infection, antibiotic sensitivity and resistance. Out of 111 patients who underwent Total abdominal hysterectomy 22 developed wound discharge and 13(11.7) were positive for culture. All organisms causing wound infection were resistant to prophylactic antibiotic (first generation cephalosporin). Hence a better antibiotic should be used in women who develop wound infection covering MRSA, MRCONS and Enterococcus group.

Keyword: Abdominal hysterectomy, Wound infection, Prophylactic antibiotic

Introduction
Abdominal Hysterectomy is one of the most common gynaecological surgeries done. Infection at the surgical site after abdominal hysterectomy is a common complication. The importance of preventing surgical site infections is well recognized since they lead to increased morbidity and length of hospital stay, associated with prolonged antibiotic treatment, need for re-operation and even readmission.
The major risk factors for developing surgical site infections after hysterectomy include older age, poor general health condition, anemia, Diabetes mellitus prolonged hospitalization, longer duration of surgery. Several studies have shown involvement of Staphylococcus aureus, Escherichiacoli, Enterococci and anaerobic bacteria as being the causative pathogens. Antibiotic prophylaxis has been shown to reduce the risk of surgical site infection after hysterectomy. A significant portion of pathogens causing post-hysterectomy abdominal wall wound infection are resistant to the prophylactic treatment, and some are resistant to the empirical treatment.

Prophylaxis is achieved by giving antibiotics preoperatively and peak serum and tissue concentration achieved within 20 minutes. Several antibiotics have been used in combinations, single dose, or multiple dose regimens given preoperatively or over the course of several days. Gynaecological morbidity, usually recorded in terms of febrile morbidity, hospital stay superficial or deep wound infection, chest infection and urinary tract infection. Single dose antibiotic prophylaxis has been proved as effective as multiple-dose in prevention of post operative infections in several studies. The vagina is normally colonized with a wide variety of bacteria, including gram-positive and gram-negative aerobes and anaerobes. The normal flora of the vagina include staphylococci, streptococci, enterococci, lactobacilli, diphtheroids, *E. coli*, anaerobic streptococci, Bacteroides species, andFusobacterium species. Postoperative vaginal flora differ from preoperative flora: enterococci, gram-negative bacilli, and Bacteroides species increase postoperatively. Postoperative changes in flora may occur independently of prophylactic antimicrobial administration and are not by themselves predictive of postoperative infection. Postoperative wound infections after abdominal and radical hysterectomy are polymicrobial; gram- positive cocci and enteric gram-negative bacilli predominate, and anaerobes are frequently isolated. Aim of this study is to find incidence of post operative wound infection following hysterectomy, organisms causing infection their sensitivity to antibiotics, risk factors involved.

MATERIAL AND METHODS
All women who underwent Total abdominal hysterectomy from JAN 2011 – SEPT 2011 were followed up. Patients were admitted 2 days before surgery, first generation Cephalosporin Cefazolin 1gm IV was given half an hour before surgery and another dose 12 hours after surgery. Women with wound discharge were further followed up by sending wound swab for culture and sensitivity. Empirically Cefazolin was continued till culture reports were available and antibiotics changed according to sensitivity. Risk factors associated with wound infection were also analysed.

RESULTS:
During the nine months study period 111 women underwent abdominal hysterectomy. Wound culture were taken from women who developed wound discharge; 22 cases had wound discharge of which 13 were positive for culture[Table 1; Fig-1].

Figure 1 - INCIDENCE OF WOUND INFECTION
The patient characteristics who underwent hysterectomy are given in Table 2. Mean age undergoing hysterectomy is 45.18±7.75. Most patients were in the category 41-50yrs.
Most common co-morbid condition associated among the women was anemia (n = 33), Hyper tension (n = 23), DM (5), obesity (n = 20), Hypothyroid (n = 8). These risk factors show Suggestive significance with 0.062 (P value: 0.05<P<0.10) for association with wound infection. [Table- 3; Fig - 3]
Fibroid is the most common indication of hysterectomy. Indication for surgery fibroid 58.6% (n = 65), Adenomyosis 9.9% (n = 11), ovarian mass 8.1% (n = 9), DUB 8.1% (n = 9), Post menopausal bleeding 6.3% (n = 7), others 9% (n = 10). [Table 4; Fig - 4]

<table>
<thead>
<tr>
<th>Indication</th>
<th>Number of patients (n=111)</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Fibroid</td>
<td>65</td>
<td>58.6</td>
</tr>
<tr>
<td>Ovarian mass</td>
<td>9</td>
<td>8.1</td>
</tr>
<tr>
<td>Adenomyosis</td>
<td>11</td>
<td>9.9</td>
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<tr>
<td>PMB</td>
<td>7</td>
<td>6.3</td>
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<tr>
<td>DUB</td>
<td>9</td>
<td>8.1</td>
</tr>
<tr>
<td>Others</td>
<td>10</td>
<td>9.1</td>
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Most of the patient underwent total abdominal hysterectomy with bilateral salpingo oophorectomy 56.75% (n = 63), total abdominal hysterectomy alone 20.72% (n = 23), total abdominal hysterectomy with left salpingo oophorectomy 14.4% (n = 16), total abdominal hysterectomy with right salpingo oophorectomy 9% (n = 10). Of the 13 organisms isolated most common where nosocomical infections, like MRSA (n = 2), MRCONS (n = 2), Enterococcus faecalis (n = 2), Enterococcus faecium (n = 1), Staphylococcus aureus (n = 1), E coli ESBL + Morganella morgagni (n = 1), Pseudomonas + Morganella morgagni (n = 1), Klebsiella ESBL (n = 1), Proteus mirabilis (n = 1), Proteus + Klebsiella (n = 1). [Fig-5]

All 13 organisms were resistant to prophylactic antibiotic (Cefazolin) and most of the organisms were sensitive to higher antibiotics like Linezolid, Vancomycin, Piperacillin and Tazobactum alone. Period of hospitalisation is higher in wound infection cases than non infected cases with p value 0.148. [Table 5 Fig-6]
Table 5: Hospital stay in days

**Fig - 6** Duration of surgery in infected cases is more when compared to non infected cases. But not statistically significant from this study, p – 0.661[Table -6]

**Table -6: Duration of surgery with incidence of wound infection**

**DISCUSSION:**
Hysterectomy is a common gynaecological surgery done nowadays. Wound infections are common occurrence following abdominal hysterectomy and are a major source of morbidity in the post of operative period. The use of prophylactic antibiotic reduces incidence of wound infection. The recommended antibiotic prophylaxis in gynaecological surgeries is Cephalosporins. In spite of using prophylactic antibiotics our wound infection rate was 11.7 % which is more than the infection rate as studied by the Can ters for Disease Control and Prevention where the incidence of nosocomial surgical infections ranged from 4.3 % in community hospitals to 7% in municipal hospitals. We noted theatre contamination for a short period when the study was conducted during the months of FEB and MARCH. The number of cases infected during this period was 5(38.4%) out of 13 total infected cases. This was retrospectively found and corrected.

Hence incidence of these types of infections can be prevented by simple preventive measures like thorough pre operative mechanical and antibiotic bowel preparation in combination with systemic antibiotic prophylaxis, proper preparation of parts, meticulous surgical technique, strict asepsis, sterile environment, closed suction drainage if bacterial spill suspected during surgery, lesser duration of surgery and proper wound care. We analysed the wound infections and organisms causing it. Most of the organisms isolated were nosocomial like MRSA, MRCONS, Enterococci. Which were resistant to our prophylactic antibiotic. To cover these resistant organisms which are only sensitive to higher antibiotics like Vancomycin, Piperacillin, Tazobactum, Linezolid, Imepenam/Meropenam, It is better to change empirical treatment.

Since this study was conducted with limited number of patient and short duration we are unable to recommend empirical antibiotic regimen from our study.

**CONCLUSION:**
In uncomplicated cases prophylactic antibiotic Cephalosporin is sufficient to prevent wound-infection. In complicated cases where risk factors like anemia, obesity, Hypertension and other comorbidities are present it is necessary to add higher antibiotics covering MRSA, MRCONS, Enterococci.

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