A wound is a breach in the skin and the exposure of subcutaneous tissue following loss of skin integrity. Wound infection occurs as a complication of surgery, trauma or disease that may interrupt a mucosal or skin surface. Wound infections are one of the most common hospital acquired infections. They are an important cause of morbidity and mortality. The present study was undertaken to determine the aerobic bacterial agents responsible for different wound infections, its sensitivity pattern and to find out the most common bacterial agent in pathological, trauma and post-operative wound infections. All pus or wound swabs from various wound infections received in the department of Microbiology for culture and sensitivity during January 2012 to December 2012 from IPD and OPD patients attending tertiary care hospital were cultured on 5% sheep blood agar and MacConkey agar. The bacterial isolates were identified by standard bacteriological techniques. Isolated organisms were further tested for antibiotic sensitivity, MSRA and ESBL productions. Out of 303 samples, 202 (66.66%) were culture positive in which 140 (69.31%) samples were monomicrobil and 62 (30.69%) samples were polymicrobial. Thus total 271 isolates were obtained from 202 culture positive samples. Of the total 271 isolates, 160 (59.04%) were gram negative ans 111 (40.96%) were gram positive organism. The most common isolates was S. aureus (37.63%) followed by Pseudomonas spp. (20.33%) and E.Coli (19.56%). In pathological and post-operative wound infections S.aureus was the most common i.e.44.62% and 34.09% respectively. Whereas pseudomonas species was most common in trauma wound infections. Isolated strains of S. aureus were 78% sensitive to Amikacin and 73% sensitive to Linezoid. E.coli, Klebsiella spp and proteus spp were 81%, 57% and 91% sensitive to Amikacin respectively. Pseudomonas spp were 96% sensitive to imipenem and 56% sensitive to Amikacin. Isolated most of the strains of gram positive and gram negative organisms were sensitive to Amikacin, whereas there was no single common antibiotic to which all isolated gram positive and gram negative bacteria were 100% sensitive. We found 67.65% MRSA and 38.12% ESBL producers in this study.
integrity of the skin disrupted a wound result. (Zafar et al., 2007) A wound is a breach in the skin and exposure of subcutaneous tissue following loss of skin integrity which provides a moist, warm and nutritive environment that is conductive to microbial colonization and proliferation. (Bowler et al., 2001)

Wound infection occurs as a complication of surgery, trauma or disease that may interrupt a mucosal or skin surface. (Njoku-Obi and Ojiegbe, 1989) Development of wound infection depends on the interplay of many factors. The breaking of the host protective layer, the skin, and thus disturbing the protective function of the layer will induce many cell types into the wound to initiate host response. (Collier, 2003) Infection of wound is the successful invasion and proliferation by one or more species of microorganisms anywhere within the body sterile tissue, sometimes resulting in pus formation. (Mordi and Momoh, 2009)

Wound can be classified as accidental, pathological, or post-operative. Irrespective of the wound nature, infection is the attachment of microorganisms to host cells and their proliferation, colonization ultimately leading to host tissue damage. (Collier, 2003) Wound infection can be caused by different group of microorganisms like bacteria, fungi and protozoa. (Zafar, 2007) Bacteriological studies have also shown that wound infection is universal and that the types of bacteria very with geographical location, bacteria resident on the skin, clothing at the site of the wound, time between wound and examination. (Akinjogunla et al., 2009) The infections are caused by both Gram positive and Gram negative bacteria especially by Staphylococcus aureus (S.aureus), Escherichia coli (E.coli) and Pseudomonas aeruginosa (p.aeruginosa) (Bowler and Duerden, 2001).The common Gram positive organisms are the B-hemolytic Streptococci, Streptococcus pyogenes (S. pyogenes) and S.aureus. The facultative anaerobes include Enterbacter spp, E.coli, Klebsiella spp, Proteus spp and aerobic Gram negative rods are P.aeruginosa. The fungal organisms are Candida spp and moulds (Aspergillus spp.) (Sani et al., 2012)

Wound infections are one of the most common hospital acquired infections. They are an important cause of morbidity and account for 70-80% mortality. (Gottarup et al., 2005) Development of such infection represent delayed healing, cause anxiety and discomfort for patient, longer hospital stays and add to the cost of health care services significantly. (Mohanty et al., 2004) The wide spread use of antibiotics together with the length of time over which they have become available have lead to major problem of resistant organisms contributing to high morbidity and mortality. Antimicrobial resistance can increase complications along with increase in cost related to procedure and treatment. (Taiwo et al., 2002) Infection caused by Methicillin-resistant S.aureus (MRSA) and multidrug resistant organisms like extended spectrum beta-lactamase (ESBL) producer pose a major challenge in the treatment of wound infection. So, appropriate drug selected by antibiotic sensitivity testing have great importance. (Kaur et al., 2008)

This study was therefore aimed to determine the bacteriological profile of pathological, traumatic and post-operative wound infections and its sensitivity patterns, which is helpful in the management of these wound infections and formulating a Rational Antibiotic Policy in this hospital.

The main and objectives of this study includes to find out the aerobic bacterial agent responsible for causing pathological, trauma and post-operative wound infections.
To find out sensitivity pattern of isolated bacterial agents.

To find out commonest bacterial agents responsible for above wounds.

**Materials and Methods**

The prospective observational study was conducted after the permission from ethical committee.

An analysis was conducted on 303 pus or wound swabs from all types of wound like burns, bed sores, cellulitis, ulcers, abscesses, osteomyelitis, trauma wounds, and postoperative sepsis received in the Department of Microbiology for culture and sensitivity during January 2012 to December 2012 from IPD and OPD patients attending tertiary care hospital. Isolated organisms were tested for antibiotic sensitivity pattern, MRSA and ESBL production.

**Inclusion criteria**

Pus and wound swabs from all age group and birth sexes received in the department of Microbiology for aerobic bacterial culture and sensitivity were included in this study.

**Exclusion criteria**

Sample for acid fast bacterial culture were excluded from this study.

Two wound swabs (one for Gram stain and another for culture) or pus from different types of wound were processed. Gram staining was done from one swab and findings were recorded. Another swab was used for culture on 5% sheep blood agar and MacConkey agar. Inoculated plates were incubated at 37°C. After overnight incubation growth if any was identified by standard bacteriological technique including colony morphology, Gram staining from colony and biochemical properties. (Church *et al.*, 2006; Mackie and McCartney, 1989)

**Antibiotic sensitivity testing**

The antibiotic sensitivity of isolated strain was carried out by using Kirby Bauer disc diffusion method on Muller Hinton agar by using commercially available antibiotic discs (Hi Media). (Kirby *et al.*, 1966). The following antibiotics were used for Gram positive and Gram negative strains in the present study.

**For gram positive organisms**

Clindamycin 2µg, Cefoxitin 30µg, Ciprofloxacin 5µg, Doxycycline 30µg, Erythromycin 15µg, Linezoid 30µg, Penicillin10 units/disc, Amikacin 30µg, Levofloxacin 5µg, Co-trimoxazole 25 µg.

**For Gram negative bacteria**

Amikacin 30µg, Levofloxacin 5µg, Co-trimoxazole 25 µg, Amoxycillin- clavulanic acid 20/10µg, Ceftazidime 30µg, Cefexime 30µg, Cefoperazone 75µg, Ceftriaxone 30µg, Cefuroxime 30µg, Ofloxacin 5µg, Piperacillin-Tazobactum 100/10µg, Imipenem 10µg.

The known ATCC standard strain of *E.coli* (25922), *S.aureus* (25923) and *P. aeruginosa* (27853) were used as quality control throughout the study for culture and antimicrobial testing.

**Detection of MRSA:** (Clinical and Laboratory Standards Institute, 2012)

The isolated *S. aureus* strains were tested for MRSA by using cefoxitin disc along with the antibiotic sensitivity testing of different antibiotics used in this study. In case of cefoxitin disc if the Zone of Inhibition was less than or equal to 21mm was considered as
MRSA while more than or equal to 22mm zone of inhibition was considered as MSSA (CLSI2012). Quality control was mentioned by using ATCC MRSA (43300) strain.

Detection of ESBL producing strains: (Clinical and Laboratory Standards Institute, 2012)

Gram negative isolates which showed resistance to ceftazidime were tested for ESBL production by ESBL phenotypic confirmatory test. (CLSI, 2012).

Standard inoculum were prepared from 3-4 colonies of identified Gram negative isolates on peptone water in a tube and incubated at 37° for 4 hours.

After incubation turbidity of inoculums was compared and adjusted to 0.5 McFarlands. Inoculum was inoculated on Muller Hinton agar by using sterile cotton swab and allowed to dry surface of agar for 3-5 minutes.

Then ceftazidime (30µg) and ceftazidime - clavulanic acid (30/10µg) disc were placed 15mm apart on inoculated Muller Hinton agar by using sterile forceps. Similarly cefotaxime (30µg) and cefotaxime-clavulanic acid (30/10µg) discs were placed 15mm apart. The plates were incubated at 37°C for 16-18 hours.

After incubation zone of inhibition around all these four discs was measured using ruler. A 5mm or more increase in zone of inhibition around ceftazidime-clavulanic acid than ceftazidime alone or cefotaxime-clavulanic acid than cefotaxime alone was considered as ESBL producer. ATCC ESBL producer Klebsiella pneumoniae (700603) was used as quality control. (CLSI2012).

Results and Discussion

A total 303 pus or wound swab samples received in the department of microbiology were subjected for culture and bacterial isolates were identified by standard bacteriological techniques. Isolated organisms were further tested for antibiotic sensitivity, MRSA and ESBL production. Out of 303 samples, 101 were culture negative 202 were culture positive; in which 140(69.31%) samples were monomicrobial and 62(30.69%) were polymicrobial. Thus total 271 isolates were obtained from 202 culture positive samples; and following observations were made:

In the present study culture positivity was 66.66%. Out of 202 culture positive samples, 140 (69.31%) samples were monomicrobial and 62(30.69%) were polymicrobial. Thus total 271 organisms were obtained.

Out of 271 bacterial isolates, 160(59.04%) isolates were Gram negative and 111(40.96%) isolates were Gram positive.

Among total the most common isolate was S. aureus 102(37.63%) followed by pseudomonas spp 55 (20.33%), E.coli 53(19.56%), Klebsiella spp 37(13.65%), Proteus spp 11(4.05%), Streptococcus spp 8(2.95%), Citobacter, Enterobacter spp 2 each (0.74%) and Enterococci spp one (0.34%).

The percentage of culture positivity among pathological and post-operative wound infection was 67.39% and 67.33% respectively. In trauma wound infections it was 57.14%.

In pathological wound infections 100% culture positivity was seen in bed sores and cellulitis. In ulcers it was 69.86%, burns 69.23%, osteomyelitis 66.66%, abscesses 64.77% and in others 50.00%.

In the present study, out of total 121 isolates from pathological wound infections, S.aureus was the most common i.e. 54(44.62%)
followed by *E.Coli* 24 (19.83%), *Pseudomonas spp* 18 (14.88%), *Klebsiella spp* 14 (11.57%), *Streptococcus spp* 5 (4.13%), *Proteus spp* 4 (3.31%), *Citrobacter spp* and *Enterococci spp* one (0.83%) each.

Out of 18 isolates in trauma wound infection, *Pseudomonas spp* was the most common isolates i.e 6 (33.33%), in trauma/RTA wound infections followed by *E.Coli* 5 (27.77%), *S.aureus* and *Klebsiella spp* 3 (16.67%) each; and *Proteus spp* one (5.56%). In this study even a single sample of animal/insect bite wound infection was not received.

Out of 132 isolates from post-operative wound infections, 45 (34.09%) isolates were *S.aureus* the most common isolates followed by *Pseudomonas spp* 31 (23.48%), *E.Coli* 24 (18.18%), *Klebsiella spp* 20 (15.15%), *Proteus spp* 6 (4.54%), *Streptococcus spp* 3 (2.27%), *Enterobacter spp* 2 (1.52%) and *Citrobacter spp* one (0.76%).

In the present study, the most common organism in pathological and postoperative wound infection was *S.aureus* i.e. 54 (44.62%) and 45 (34.09%) respectively. In trauma wound infection commonest organism was *Pseudomonas spp* i.e. 6 (33.33%).

In the present study isolated *S.aureus* were 78% sensitive to amikacin, 75% to linezolid, 70% to levofloxacin, 68% to doxycycline and 54% sensitive to clindamycin.

*Pseudomonas spp* were 96% sensitive to imipenem, 56% sensitive to amikacin and 51% sensitive to levofloxacin.

*E.Coli* were 81% sensitive to amikacin, 42% sensitive to levofloxacin and 38% sensitive to piperacillin-tazobactum.

*Klebsiella spp* were 57% sensitive to amikacin and 49% sensitive to levofloxacin. Whereas 100% resistant to amoxycillin + clavulanic acid, cefalexine and cefuroxime.

*Proteus spp* were sensitive to amikacin, levofloxacin and piperacillin and ofloxacin. Whereas 100% resistant to amoxycillin + clavulanic acid, cefalexine, cefoperazone, ceftrizone, cefuroxime.

*Streptococcus spp* were 30% sensitive to amikacin, 57% and 63% sensitive to levofloxacin and doxycycline respectively.

*Citrobacter spp* were 50% sensitive to amikacin, levofloxacin, piperacillin and ofloxacin. Whereas 100% resistant to amoxycillin clavulanic acid, cefalexine, cefoperazone, ceftrizone, cefuroxime.

*Enterobacter spp* were 100% sensitive to amikacin, levofloxacin, piperacillin and ofloxacin. Whereas 100% resistant to amoxycillin clavulanic acid, cefalexine, cefoperazone, ceftrizone, cefuroxime.

*Enterococci spp* were 100% sensitive to amikacin, levofloxacin, linezolid, doxycycline and clindamycin. Whereas 100% resistant to ciprofloxacin, erythromycin, penicillin, cotrimoxazole.

Isolated most of the strains of Gram positive (*S.aureus*, *Streptococcus spp* and *Enterococci spp*) and Gram negative (*E.Coli*, *Proteus spp*, *Enterobacter spp*) organisms were sensitive to amikacin.

Whereas there was no single common antibiotic to which all isolated Gram positive and Gram negative bacteria were 100% sensitive.

Out of 102 *S.aureus* isolates 69 (67.65%) were MRSA and out of 160 Gram negative isolates, 61 (38.12%) were ESBL producers.
**Table.1** Culture positivity in different sub types of wound infections

| Nature of wound infections | Total no of samples | No of samples showing growth | Sterile samples | % of culture positivity |
|---------------------------|---------------------|-----------------------------|-----------------|------------------------|
| **A. Pathological**       |                     |                             |                 |                        |
| 1. Burn                   | 13                  | 9                           | 4               | 69.23%                 |
| 2. Bed sore               | 2                   | 2                           | 0               | 100%                   |
| 3. Cellulitis             | 5                   | 5                           | 0               | 100%                   |
| 4. Ulcer                  | 23                  | 16                          | 7               | 69.86%                 |
| 5. Abscess                | 88                  | 57                          | 31              | 64.77%                 |
| 6. Osteomyelitis          | 3                   | 2                           | 1               | 66.66%                 |
| 7. others                 | 4                   | 2                           | 2               | 50.00%                 |
| **B. Trauma**             |                     |                             |                 |                        |
| Trauma/RTA                | 21                  | 12                          | 9               | 57.14%                 |
| **C. Postoperative**      |                     |                             |                 |                        |
| Total                     | 303                 | 202                         | 101             | 66.66%                 |

**Table.2** Organisms isolated from different sub types of pathological wound infection

| Organism isolated  | Total no. of isolates (%) | Burn | Bedsore | Cellulites | Ulcer | Abscess | Osteomyelitis | Other |
|--------------------|---------------------------|------|---------|------------|-------|---------|---------------|-------|
| *S. aureus*        | 54 (44.62%)               | 3    | 1       | 1          | 6     | 40      | 2             | 1     |
| *E. Coli*          | 24 (19.83%)               | -    | 1       | -          | 4     | 19      | -             | -     |
| *Pseudomonas spp*  | 18 (14.88%)               | 7    | -       | 2          | 5     | 4       | -             | -     |
| *Klebsiella spp*   | 14 (11.57%)               | 2    | -       | 1          | 7     | 3       | -             | 1     |
| *Streptococcus spp*| 5 (4.13%)                 | -    | -       | 3          | 2     | -       | -             | -     |
| *Proteus spp*      | 4 (3.31%)                 | -    | 1       | -          | 1     | 2       | -             | -     |
| *Citrobacter spp*  | 1 (0.83%)                 | -    | -       | -          | -     | 1       | -             | -     |
| *Enterococci spp*  | 1 (0.83%)                 | 1    | -       | -          | -     | -       | -             | -     |
| Total              | 121 (100%)                | 13   | 3       | 7          | 25    | 69      | 2             | 2     |

**Table.3** Organisms isolated from sub types of trauma wound infections

| Organisms isolated  | Total no. of isolates |
|---------------------|-----------------------|
| *Pseudomonas spp*   | 6 (33.33%)            |
| *E. Coli*           | 5 (27.77%)            |
| *S. aureus*         | 3 (16.67%)            |
| *Klebsiella spp*    | 3 (16.67%)            |
| *Proteus spp*       | 1 (5.56%)             |
| Total               | 18 (100%)             |
Table 4 Organisms isolated from postoperative wound infection

| Organisms isolated | Total no. of organisms (%) |
|--------------------|-----------------------------|
| S. aureus          | 45 (34.09%)                 |
| Pseudomonas spp    | 31 (23.48%)                 |
| E. Coli            | 24 (18.18%)                 |
| Klebsiella spp     | 20 (15.15%)                 |
| Proteus spp        | 06 (4.54%)                  |
| Streptococcus spp  | 03 (2.27%)                  |
| Enterobacter spp   | 02 (1.52%)                  |
| Citrobacter spp    | 01 (0.76%)                  |
| **Total**          | **132 (100%)**              |

Table 5 Most common isolates from pathological, trauma and post-operative wound infections

| Nature of wound | Most common organism | No. of isolates | % of most common isolates |
|-----------------|----------------------|-----------------|---------------------------|
| Pathological    | S. aureus            | 54 (n=121)     | 44.62%                    |
| Trauma          | Pseudomonas spp      | 06 (n=18)      | 33.33%                    |
| Postoperative   | S. aureus            | 45 (n=132)     | 34.09%                    |

Table 6 Drug sensitivity (%) pattern of isolates from different type of wound infection

| Organism isolated (no.) | CD | CX | CLP | DO | E | LZ | P | AK | LE | CO | SPP | AMC | CAZ | CFM | CPZ | CT | IPM | OF | PIT |
|-------------------------|----|----|-----|----|---|----|---|----|----|----|-----|-----|-----|-----|-----|----|----|----|-----|
| S. aureus (n=126)       | S  | 55 | 33 | 38 | 46 | 69 | 68 | 33 | 74 | 78 | 22 | 95 | 32 | 39 | 70 | 69 | -  | -  | -  | -   |
| Pseudomonas spp (n=118) | S  | 55 | 33 | 38 | 46 | 69 | 68 | 33 | 74 | 51 | 78 | 43 | 42 | 25 | 14 | 10 | 18 | 16 | 14 | -  | -   |
| Klebsiella spp (n=37)   | S  | 55 | 33 | 38 | 46 | 69 | 68 | 33 | 74 | 78 | 22 | 95 | 32 | 39 | 70 | 69 | -  | -  | -  | -  | -   |
| Enterobacter spp (n=11) | S  | 55 | 33 | 38 | 46 | 69 | 68 | 33 | 74 | 78 | 22 | 95 | 32 | 39 | 70 | 69 | -  | -  | -  | -  | -   |

(S-Sensitivity, R-Resistant, n-number of isolates, CD-Clindamycin, CX-Cefoxitin, CIP-Ciprofloxacin, DO-Doxyycyclin, E-Erethromycin, LZ-Lenezolid, P-Penicillin, AK-Amikacin, LE-Levofloxacin, COT-Cotrimaxazole, AMC-Amoxicillin=Ceclavulonic acid, CAZ-Caftazidime, CFM-Cefezime, CPZ-Cefoperazone, CXM-Cefuroxime, OF-Ofloxacin, PIT-Piperacilin + Tazobactum, IPM-Impinenem)
Table 7: Isolation of MRSA and ESBL producer in wound infections

| Organisms isolated | Total no. of isolates | MRAS (%) | ESBL Producers (%) |
|--------------------|-----------------------|----------|--------------------|
| S.aureus           | 102                   | 69(67.65%) | -                  |
| Gram negative     | 160                   | -        | 61(38.12%)         |

Infection in a wound delays healing, causes wound breakdown, dehiscence, prolongation hospital stay, increased trauma and treatment cost. (Akinjogunla et al., 2009) Wound infection is an important cause of morbidity and mortality among surgical patients.

Infections of hospital acquired wounds are among the leading nosocomial causes of morbidity and increasing medical expenses. (Giacometti et al., 2000) The control of wound infections has become more challenging due to wide spread bacterial resistance to antibiotics and to a greater incidence of infections caused by Methicillin resistance S.aureus (MRSA) and polymicrobial flora. (Akinjogunla et al., 2009)

The knowledge of the causative agents of wound infection has therefore proved to be helpful in the selection of empiric antimicrobial therapy and on infection control measures in hospital.

The present study was carried out from January 2012 to December 2012. Total 303 wound swabs or pus samples were received out of which 202 (66.66%) were culture positive whereas in 101 (33.33%) of cases there was no growth. In the present study culture positivity of wound infection was 66.66% which was in accordance with Azane et al., (2011). In the present study out of 271 isolates, 160 (59.04%) isolates were Gram negative and 111(40.96%) isolates were Gram positive. This was in accordance with Azene et al., (2011), where Gram negative isolates were 56.6% and Gram positive isolates were 43.4%, Zafer et al., (2007), Goswami et al., (2011) and Mohanty et al., (2004) have also reported higher isolation of Gram negative organisms in a range of 50-70% as compare to Gram positive organisms in a range of 30-49% in their study.

The most common organism isolated from wound infections in this study was S.aureus 102 (37.63%) followed by Pseudomonas spp 55(20.30%), E.Coli 53(19.56%), Klebsiella spp 37(13.65%), Proteus spp 11(4.05%), Strptococcus spp 8(2.95%), Citrobacter spp and Enterobacter spp 2(0.74%; each and Enterococci spp one(0.73%).The proportion of bacterial isolates was in agreement with previous study done by Azene et al., (2011), where S.aureus (41.6%) was the most common isolate in their study followed by Pseudomonas spp (18.4%), E.Coli (16.4%), Proteus spp (11.0%), Citrobacter and Enterobacter spp (4.2%) each, and Klebsiella spp, (2.4%). Several previous studies (Zafer et al., 2007, Anubamani et al., 2006, Mordi et al., 2009, Karia et al., 2013 and Egbe et al., 2011) reported S.aureus was the most common organism followed by Pseudomonas spp, E.Coli, Klebsiella spp, Proteus spp, and Streptococcus spp. Whereas Sule et al.,
(2002) reported *Klebsiella spp* was the most prevalent in the obstetrics and gynaecological wounds and *P. aeruginosa* was the commonest in orthopaedics wounds. This might be due to geographical variations because bacterial etiology can show geographic variations and may even vary over time within a population.

The culture positivity of pathological wound infection was 67.69%, trauma wound infection was 57.14%, and post-operative wound infection was 67.33% in the present study. In the previous study done by Mordi et al., (2009) and Pramodhini et al., (2012) reported 100% culture positivity in pathological wound infection in their study.

Mordi et al., (2009) and Akinjogunla et al., (2009) reported 97.85% and 97.5% culture positivity in trauma wound infection respectively.

Shanthi et al., (2012) reported 67% incidence of post-operative wound infection which is similar to our study. Whereas in several previous studies done by Ranjan et al., (2010), Kownher et al., (2008) and Patel et al., (2012) reported higher incidence of postoperative wound infection i.e.91%, 88.46%, and 87.5% respectively. Above findings shows that incidence of all 3 types of wound infections is low in our hospital may be due to proper wound care, proper hygiene standard within a hospital. Postoperative sepsis rate in any hospital depends much on the case material, hospital environment, irrational use and availability of antibiotics.

In the present study isolated *S. aureus* were 78% sensitive to Amikacin, 73% to Linezolid, 70% to levofloxacin and 68% sensitive to Doxycyclin. In isolated Gram negative bacteria, *Pseudomonas spp* were 96% sensitive to imipenem and 56% sensitive to Leofloxacin. *E.Coli, Klebsiella spp* and *Proteus spp* were 81%, 57% and 91% sensitive to Amikacin respectively. Whereas *Proteus spp* were also 82% sensitive to Levofloxacin and Piperacillin-tazobactum, *Klebsiella spp* were 100% resistance to Amoxicillin-clavulanic acid, Cefexime and Cefuroxime. In the present study isolated most of the strains of Gram positive (*S.aureus, Streptococcus spp and Enterococci spp*) and Gram negative (*E.Coli, Proteus spp* and *Enterobacter spp*) organism were sensitive to Amikacin.

In previous studies reported that *S.aureus* was sensitive to Amikacin (Garg et al., 2009, Siguan et al., 1990, and Tayfour et al., 2005). Kaur et al., (2008) also reported that *S.aureus* was 74.4% sensitive to Amikacin and 97.5% sensitive to Linezolid. Whereas in the same study *E.Coli, Klebsiella spp, Proteus spp* and *P.aeruginosa* were 80%, 60%, 50%, and 50% sensitive to Amikacin respectively which were in accordance with present study. In previous study Goswami et al., (2011) reported that levofloxacin is sensitive to both Gram positive and Gram negative organisms. Amikacin is sensitive to both Gram positive and Gram negative isolates was reported in studies done by Siguan et al., (1990) and Dhar et al., (2007). Amikacin is effective for all Gram negative isolates was reported in various previous studies Shanthi et al., (2012), Kauer et al., (2008), Kownhar et al., (2008), and Dhar et al., (2007). *Pseudomonas spp* were 96% sensitive to imipenem in the present study. This was comparable with Tayfour et al., (2005), Mehta et al., (2007), and Ranjan et al., (2010) who reported that *Klebsiella spp* were 100% resistant to Amoxicillin-clavulanic acid which was similar to this study.

In the present study there was no single common antibiotic to which all isolated Gram positive and Gram negative isolates were increasingly resistant to routinely used antibiotics.
In the present study we found 69 (67.65%) Methicillin resistant *S.aureus*. This was less than previous study done by Etok et al., (2012) who reported 100% Methicillin resistance in *S.aureus* (MRSA) from surgical wound infection. Pramodhini et al., (2012) and Mohanty et al., (2004) who reported 32.7% and 38.58% MRSA respectively.

In present study out of 160 Gram negative bacteria isolated, 61(38.12%) were ESBL producers. This is comparable to that reported previously (32.6%) by Pramodhini et al., (2012). Higher rate of ESBL producers were reported by Mohanty et al., (2004)-66.75% and Shanthi et al., (2012)-65.2% in their study.

Finally this study concludes that contracting wound infection remains an ongoing problem. The main culprits for wound infection are Methicillin resistant *S.aureus*, ESBL producing Gram negative bacteria like *Pseudomonas spp*, *E.Coli*, *Klebsiella spp*, and *Proteus spp*. Although complete eradication of wound infections is not possible however we recommend that by taking preventive measures, adopting prompt clean surgical procedures, instituting sensitivity based antibiotic treatment and proper surgical care of wounds, the incidence of wound infection can be reduced. Therefore there is need of ongoing studies on wound infections for isolating different causative organisms, to know its sensitivity pattern for management of wound infections and minimize emergence of drugs resistant organisms.

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