SUMMARY AND CONCLUSIONS

Surgical site infection causes considerable morbidity, mortality and high cost to the health care system and is becoming increasingly important in medicolegal aspects. A few studies were conducted in our country on such an important topic. In our study it has been tried to find out the common organisms responsible for surgical site infections. In addition, the sensitivity patterns of the microorganisms were ascertained. In respect of post operative wound discharge and incriminated organisms, it was found that most of the SSIs were due to *Escherichia coli* (20.5%), *Staphylococcus aureus* (18.07%), *Klebsiella pneumoniae* (14.45%), *Acinetobacter baumannii* (13.25%) and *Pseudomonas aeruginosa* (12.08%).

The high rate of antimicrobial drug resistance was found in this study, raising concern that the antimicrobials commonly used in surgical patients may possibly be ineffective in preventing SSIs. This emphasizes the need of using Antibiogram pattern to guide choice of antibiotics.

A general outline of the antibiogram of all the bacterial isolates indicated that both the Gram positive bacteria and Gram negative bacteria had very high resistance levels. This situation raises serious concern. This suggests a very high resistance gene pool due perhaps to gross misuse and inappropriate usage of the antibacterial agents. Multidrug resistance was seen in most of the isolates leaving clinicians with few choices of drugs for the treatment of post surgical wound infected patients. Therefore, periodic surveillance of bacteria and antibiotic susceptibility is important to prevent further emergence and spread of resistant bacterial pathogens.

The findings of these studies suggest that bacterial resistance in surgical wound infections is becoming serious threat in all the study area. *Escherichia coli* and *Staphylococcus aureus* are the most frequently involved pathogen, showing high resistance rates of bacteria isolated from surgical wounds followed by *Pseudomonas aeruginosa*, *Klebsiella pneumoniae* and *Acinetobacter baumannii*.

Linezolid, Tigecycline, Nitrofurantoin, Gentamycin, Moxifloxacin, Quinupristin-Dalfopristin, Azithromycin, Minocycline and Doxycycline are the best therapeutic options to treat *Staphylococcal* infections because of the lesser resistance to these antibiotics. It is also observed in the present study that the majority of Gram positive bacterial isolates were sensitive to Minocycline, Doxycycline, Tigecycline, Linezolid, and Moxifloxacin.
The majority of Gram negative bacterial isolates were sensitive to Colistin, Amikacin, Meropenem, Cefoperazone-Sulbactam, and Tigecycline. Thus, these drugs appear to be effective against post surgical wound infection in the study area. These antibiotics should however be used with caution because of the emerging low level of resistance which may indicate great danger for their future use.

Amoxicillin-Clavulanic acid and Ceftazidime cannot be recommended for use as an empirical therapy in SSIs because these drugs were inactive against most strains of pathogens found in these infections. For severe infections initiate therapy with broad-spectrum agents such as Imipenem or Piperacillin-Tazobactam.

From this antimicrobial susceptibility data, it can be suggested that Imipenem, Piperacillin-Tazobactam, Linezolid, Teicoplanin and Vancomycin to be the most effective agents against most of bacteria isolated in SSIs.

Ampicillin-derivatives and Fluroquinolones (Norfloxacin, Sparfloxacin, and Gatifloxacin) were least effective against the Gram positive whereas Cephalosporins against Gram negative bacteria.

Tigecycline and Gentamycin remain the most effective antibacterial agent for both Gram positive and Gram negative bacteria.

A continuous monitoring and update studies on the local microbial isolates is an essential and mandatory requirement for a better management and treatment of post-operative wound infections. This would be supplemented with proper infection prevention and control measures and a sound antibiotic policy. This would result in better patient care, safety and health care outcomes.

LIMITATIONS OF THE STUDY

As this study has been carried out over a limited period of time with a limited number of patients, it could not have been large enough to be of reasonable meticulousness. All the facts and figures mentioned here may considerably vary from those of large series covering wide range of time, but still then, as the cases of this study were collected from hospitals in Omerga region, this study has some tribute in reflecting the facts regarding antibiogram of surgical site infection following operations.

FUTURE SCOPE

The present study focuses on the mechanism to develop a practically applicable hospital antibiotic policy and standard treatment guidelines (STG). In addition, this study contains information on various effective strategies for implementation of STG. It also discusses various activities and information required for the development of the
antibiogram, antibiotic policy and standard treatment guidelines, such as surveillance programmes, the cause and controlling strategies for Antimicrobial resistance.

Review and consideration of antimicrobial agents used within hospitals and all other responsible health institutions, strict adherence to hospital disease control and antibiotics usage policy in the study area help to reduce the spreading of drug resistance. Spreading of drug resistance can be reduced by improvement of the laboratory services capable of doing culture and sensitivity in all wound isolates before subscribing any drugs in the study area and during follow up of post-operated patients.

Use antimicrobial sensitivity test results to guide choice of antibiotics. Establish strict guidelines for antibiotics prescriptions and continuous surveillance to monitor antimicrobial susceptibility pattern of the common isolates found in SSI.

There is much more scope for further study to:

- Slow the development of resistant bacteria and prevent the spread of resistant infections.
- Strengthen national one-health surveillance efforts to combat resistance.
- Advance development and use of rapid and innovative diagnostic tests for identification and characterization of resistant bacteria.
- Accelerate basic and applied research and development for new antibiotics, other therapeutics and vaccines.
- Findings of the study can be used by the health care staff in creating policies and plans for treatment of wound infection.
- Other researchers may utilize the suggestions and recommendations for conducting further study.
- Understand emergence and spread of antimicrobial resistance.
- Establish a nationwide well coordinated antimicrobial program with well defined and interlinked responsibilities and functions of different arms of the program.
- Rationalize the usage of available antimicrobials.
- Promotion of discovery of newer and effective antimicrobials based on current knowledge of resistance mechanisms.