PATTERN OF ISOLATIONS AND SENSITIVITY IN SURGICAL PATIENTS PRESENTED TO KHYBER TEACHING HOSPITAL.

Muhammad Asghar Khan, Fazal Manan, Abdullah Khan, Ijaz Ahmad, Qutbe Alam

ABSTRACT

Objectives: To determine sensitivity pattern of surgical sites infection.

Material and Methods: Pus from 204 patients was sent for culture sensitivity by swab or in a sterile container from the site of surgical infection. The study was conducted in surgical C ward KTH Peshawar from June 2011 to December 2012. Culture sensitivity was performed by standard disc diffusion method by qualified pathologist. This was a descriptive cross-sectional study. Data was analysed using SPSS 17.

Results: In clean cases, Staphylococcus Aureus was isolated in 96.1% of cases. E-Coli were the leading cause of infection in clean contaminated cases. In contaminated cases, citrobacter was isolated in 49% of the cases Sensitivity to imepenem, meronem, piperacillin/tazobactum, Co-Amoclave and Cefuroxime was observed in decreasing order in clean cases. In clean contaminated cases Amikacin, piperacillin and meronen were equally sensitive (greater than 30% sensitivity), yet imipenem showed the greatest sensitivity (greater than 40%). Sensitivity to Co- Amoxiclave was less than that found in clean cases (32% versus 23%). Sensitivity of the organisms was almost the same in both the contaminated and dirty cases.

Conclusion: Anticipation of expected organisms and their sensitivity to the drugs before the availability of culture sensitivity should be logic and evidence based.

Keywords: surgical site infections, wound infections, antibiotic sensitivity

INTRODUCTION

Wound infections are major cause of mortality and morbidity. It is one of major public health problem.1'2 Surgical wound infection results in patient discomfort, increase in morbidity, prolonged hospital stay, delayed wound healing, economical burden on patient, annual hospital charges, spreading infection to other patients, emergence of antibiotic resistant bugs, psychological problem to patient for his/her prolonged illness and finally may result in mortality[3'4'5'6] Inflammatory process secondary to pathogenic organisms is called infection[7]. Surgical site infection has been remained the problem since surgery started for treatment despite the use of antibiotics and peri-operative care in this modern era[8] . Most of the surgical site infection is caused by commensal flora and can be replaced by antibiotic resistant bacteria in hospitalized patients. The infection may arise as result of the nature of surgery like operation on patients, with endogenous infection such as draining abscess, laparotomy for peritonitis, intra-abdominal abscesses, perforated appendicitis, commensal in the skin and anterior nares of the patient9 or it may be acquired in hospital due to poorly sterilized instruments, or breach of surgical principles, contaminated operating table, theatre's floor, suction tubes, overhead light and air of operation theatre10'11, or surgical techniques.12'13 Teixeira PG and his colleagues have reported 1.9% wound infection rate in patients with acute appendicitis. He studied 4529 patients and observed that delay of time result in increased rate of wound infections.14 Senekjian L and Nirula R has reported lower surgical wound infections rate in Laproscopic cholecystectomy than open cholecystectomy.15 Similarly McGowan DR has observed higher surgical wound infections in old age people undergoing appendicectomy16.

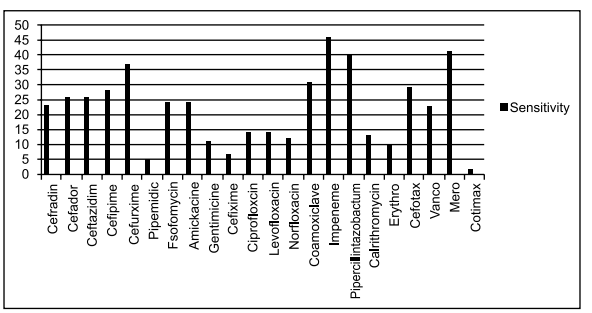
Infection depends upon the characteristics of the causative organism, local defences of the host and systemic response of the host 7. Wound infection within the 30 days of the surgery at the surgery site is labelled as surgical site infection. When puss discharging wound needs secondary procedure to drain the abscess from the wound, it is called major wound infection. And when there is simple puss and or serous fluid discharge, it is minor wound infection3. Surgical site infections can be graded according to Southampton wound grading system. Deep seated sepsis developing a few days after an operation and before the wound has been dressed, reflect a theatre infection while the ward infection is more superficial and frequently follow the dressing of wounds in the ward[17]. With the discovery of antiseptics, antiseptic techniques and antibiotics the chances of surgical sites infection are reduced 2. Nutritional status of the patient, operation theatre facilities, nursing care, duration of surgery and co-morbidity of the patient also affect the chances of post op wound infection. The rate of surgical sites infection also varies from hospital to hospital. This study was carried out to identify the most common pathogens involved in the surgical sites infection in our setup and their trend of sensitivity to the antibiotic.

MATERIAL AND METHODS

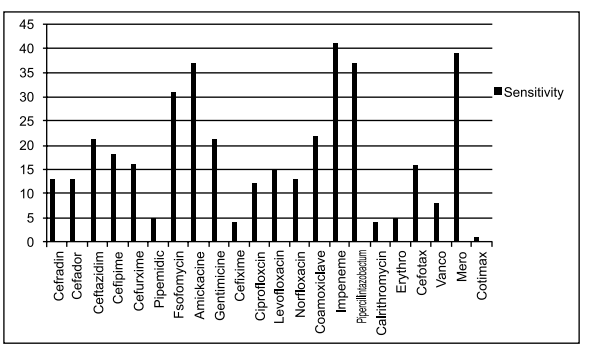
This study was carried out in SCW, KTH Peshawar from June 2011 to December 2012. Total of 204 patients with clean, clean contaminated, contaminated and dirty cases (51 cases from each category) were included. All the patients were admitted, through emergency as well as OPD. This is was a cross-sectional, descriptive and non-probability study. Patients were included regardless of their age and gender. Patients were evaluated pre-operatively for generalized weakness, weight loss, anaemia, and medications. All the patients were given per-op injection of ceftriaxone sodium 1g and continued on the same antibiotic post-operatively for the length of the hospital stay. Injection metronidazole post operatively was added in those patients who underwent gut surgery. Site of surgery was shaved on table. General Anaesthesia was administered to all patients. All the included patients were followed for 30 days and looked for wound infection clinically. Samples from wound were taken via swab stick or sterile container especially designed for culture sensitivity which was performed by standard disc diffusion method. All the relevant information was collected in Proforma specially designed for this study including patient biodata, type of procedure he/she underwent, and the antibiotics used against the organism. The data was analysed using SPSS 17.0.

RESULTS

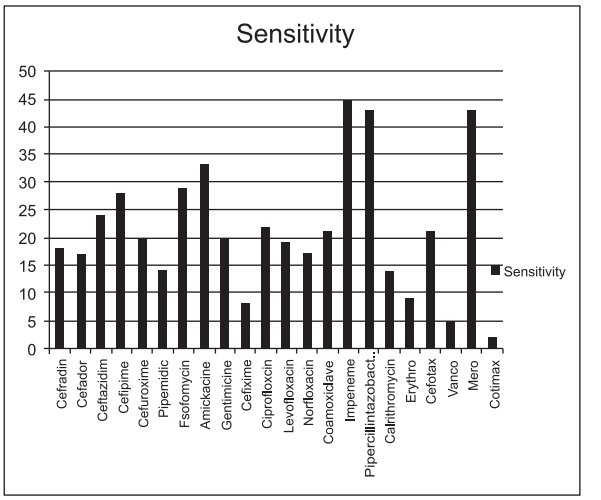
Mean age of patients 40.58 ±31.61 years ranging from 2 to 82 years. The frequency of isolated organisms in clean cases were S.Aureus (96.1%), Klebsella(2%) and E.Coli(2%). In clean contaminated it was E.Coli(29.4%), S.Aureus(27.5%), Citrobact(27.5%), Pseudomonas(9.8%), Entrobacter(3.9%) and C.Freundii(2%). In contaminated cases, c/s results shows Citrobact(49%), E.Coli(27.5%), S.Aureus(13.7%), Klebsella(3.9%), Enterobacter(2%), Proteus(2%) and Pseudomonas(2%). In dirty cases S.Aureus(41.2%), Pseudomonas(23.5%), Citrobact(19.6%), E.Coli(7.8%), Proteus(5.9%) and Klebsella(2%).



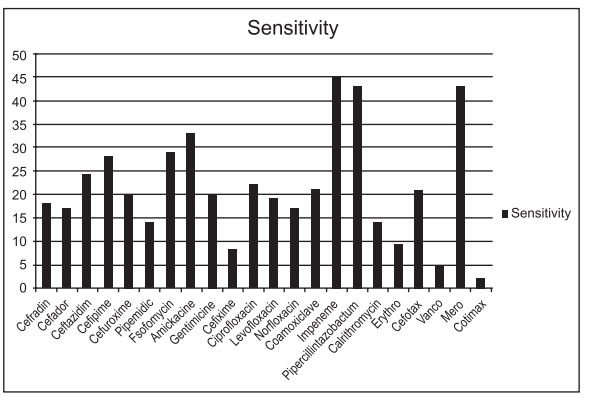
Clean Cases



Clean Contaminated



Contaminated cases



Dirty cases

The sensitivity of drugs against the organisms in each category is given in following bar graph.

DISCUSSION

Wound infection in the surgical ward is one of the major problems especially when the wound is infected by some resistant bugs. Wound infection results in increased morbidity, expenses and mortality of the patients.

In one of the study done in France, in which 38973 patients were included, over a three-year period, 1344 (3.4%) developed SSI and 78 died. Organ-space and deep incisional SSI were associated with a higher mortality and required re-operation more frequently than did superficial incisional SSI. SSI incidence and mortality varied according to the surgical procedure. In USA, as

far back as 1993, it was estimated that post-operative infection added more than $12,000 to the cost of patient-care2.

With increasing advancement in sterilisation, equipments and antibiotics, infection has been reduced but still there is a chance of infection. Even in clean surgical cases, the rate of infection is reported up to 22% 4'5. The role of antibiotic treatment in these cases is still debatable17. Every surgeon tries his best to minimise this chance to his best possible effort. However, the fact that the sterility in our operative environment is frequently breached, even clean surgical procedures here should be classified as clean contaminated6. Surgical site infections are difficult to treat. Rapidly emerging nosocomial pathogens and the problem of multi-drug resistance necessitates periodic review of isolation patterns and sensitivity in surgical practice18'19.

Staph Aureus was the most common organisms isolated in clean cases (96%) in our study. According to Mehmood A, who analysed 153 cases, Staph Aureus was the mostcommon organism isolated. [20] It was found that the most sensitive drug was imipinem (45.2%) in our study. Other drugs showing high sensitivity were meronem, pipperacillin/tazobactum, cefuroxime and co-amxiclave. De Lalla F reported from his study that pipperacillin and tazobactum was an effective combination against both gram positive and Gram negative organism[21]. Nisa M reported that out of 1290 patients, the most common bacteria were staph aerus and susceptibility to Co-Amoxiclave was very high[22].

Among the clean contaminated cases, E coli (29%) were the leading cause of infection followed by staph Aureus (27%) and citrobacter (27%). Amikacin, piperacillin and meronen were equally sensitive (greater than 30% sensitivity), yet imipenem showed the greatest sensitivity (greater than 40%). Sensitivity to Co- Amoxiclave was less than that of found in clean cases (32% versus 23%). In our study, sensitivity to ciprofloxacin was found to be 15%. Ghazi MA reported that E-Coli were the second most common cause of infection and yet most importantly, the organisms were mostly resistant to commonly used antiobiotics[23]. Citrobacter was the commonest organism in the contaminated cases followed by E.coli while in dirty cases, staphalococcus Aureus was again the leading organism in our study. Sensitivity of the organism was almost the same in both the contaminated and dirty cases. Seni J et al who studied 304 cases of Surgical sites infection, observed 23.7% of E.Coli and 21.1% staphalococcus Aureus , he further reported that imepenem and Amikacin had an excellent activity against the Enterobacteriacea. Our study is comparable to the national and international studies[24]'18.

CONCLUSION

As the sensitivity and resistance pattern of the micro-organism changes with increasing spectrum of new drugs, the need of guidelines for the empirical treatment of disease to control the spread of infection cannot overemphasized because the Culture sensitivity report may not be available immediately. This will need large sample studies and standardization of available laboratory techniques which will help to anticipate and formulate necessary empirical treatment for the patients. When the results of culture sensitivity are available, there will be high probability that it will be according to what was anticipated.

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