

Appropriate Surgical Prophylaxis Using Ceftriaxone

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Abstract

Antimicrobial prophylaxis can lower the incidence of infection after surgical intervention, reducing morbidity and mortality due to sepsis. Different types of surgical wounds require different type of Antimicrobial prophylaxis. The study aimed to assess the use of appropriate antimicrobial prophylactic agent to prevent Surgical Site Infections. Ceftriaxone can be used equivalently for surgical prophylaxis other than Cefazolin which is mostly indicated and used as surgical prophylactic agent in clean contaminated surgical wounds. Irrational use of antimicrobial agents increases the risk of antimicrobial resistance.

Keywords: Surgical Site Infection; Antimicrobial Prophylaxis; Perioperative; Antimicrobial Resistance

Abbreviations: SSI: Surgical Site Infection; PPI: Proton pump inhibitor.

Introduction

Surgical intervention helps to investigate or treat a pathological condition such as injury or disease, to improve bodily functions using instrumental and manual techniques [1]. Surgical procedures with increased rate of SSI require antimicrobial prophylaxis. Surgical prophylaxis should prevent SSI.

Appropriate selection of antibiotic for pre-operative administration lower the risk of surgical wound infection. Not all surgical procedures require antimicrobial prophylaxis, however, it is recommended for all clean-contaminated, contaminated procedures. Efficacy of the antimicrobial agent depends upon the timing of administration. Mostly cephalosporins are used. Choice can be made according to the site of surgery. For patients allergic to cephalosporins, Vancomycin can be used instead. Clindamycin and ciprofloxacin can also be used in

some cases. Optimal Intravenous Antibiotic administration is 30 to 60 minutes before incision [2].

The study aimed to assess the appropriate use of Ceftriaxone as surgical prophylactic agent in clean contaminated surgery. To encourage once only pre-op use of ceftriaxone to discourage Antimicrobial resistance. Discouraging unnecessary and irrational use of Antimicrobials by proper administration timing.

Methodology

Patient undergoing surgery was randomly selected for the study purpose. A 67 years old female patient weighing 75kg, visited OPD of hospital with the chief complaint of pain in RHC (right hypochondrium), fever, vomiting. Hospital admission was followed after OPD visit and excision of Porta Hepatis Cyst was planned. As it was a clean-contaminated surgery, an appropriate pre-operative antimicrobial was selected, in this case Ceftriaxone, for prevention of surgical site infection. No antibiotic was used peri-operatively and post-operatively.

Inj. Ceftriaxone 1gm IV was administered 30 minutes prior to surgery.

Results and Discussion

No SSI seen post operatively, which shows that infection was prevented with a single pre-operative dose of Inj. Ceftriaxone IV. Post-operative Antibiotic Administration was discouraged to prevent antimicrobial resistance.

The surgical wound type in this case was clean-contaminated and hence needed anti-microbial for the Surgical Prophylaxis. Normally amongst Cephalosporins, Cephazolin is majorly suggested by the guidelines. As per Guidelines for antimicrobial use in Pakistan, for abdominal surgeries, Cefazolin IV 1-2g Pre-Op is recommended and more than single dose is discouraged. But Ceftriaxone is not widely used, but there are some studies supporting the use of Ceftriaxone.

In a study it was concluded that Ceftriaxone is as clinically effective as 'single-shot prophylaxis' if not better than other prophylactic agents single- and multiple-dose agents over a wide range of surgical procedures [3].

According to referenced meta-analysis, 5.1% and Surgical Site Infection was recorded in 6.2% patients with Ceftriaxone and comparator group. Previous studies claimed that among Antibiotics, Ceftriaxone is superior in its antimicrobial action [3]. Half-life of Ceftriaxone Inj. is 5-11 hours, and re-administration is not required for prophylaxis; re-administration becomes a treatment rather than prophylaxis. Ceftriaxone can be used for the treatment of acute cholecystitis or acute biliary tract infections [1,4]. Over-use of antimicrobial agent will not help in prevention of Surgical site Infections but will lead to an increased risk of acquired antimicrobial resistance. Hence, in order to reduce the spreading of this acquired antimicrobial resistance, prolonged and unnecessary use of antibiotics must be prevented. Administration time is also of great importance, ideally it should be as near to the incision time. In this case, Ceftriaxone was administered 30 minutes before administration [5,6]. Proper dose, timing and duration are the parameters for the Optimal antimicrobial prophylaxis. Ideally it should be administered within 2 hours before incision which decreases SSI to 2- to 6-folds [7].

Therapeutic duplication was observed; Ketorolac + Nalbuphine + Tramadol. Too many pain killers being used at the same time, some of these can be eradicated to avoid therapeutic duplication. Pain cycle must be broken, but

continuous use of pain killers must be discouraged in the long run. Prescribing trend of Proton pump inhibitor (PPI) Twice a day was quite prevalent, which should be discouraged; if single dose PPI is not effective it can be substituted with other PPI in the class or H2 Antagonist. Follow-up was scheduled after two weeks and then after six months, to monitor patient's condition.

Conclusion

Surgical Site Infections are effectively and efficiently prevented using pre-op antimicrobial coverage and antimicrobial resistance can be reduced by controlling excessive and unnecessary use of antimicrobials. In present case, no post-operative antimicrobial therapy was initiated and there was no sign of surgical site infection, showing that there was no need for post-op antibiotic coverage in this case. No SSI was seen post operatively, which shows that infection was prevented using a single pre-operative dose of Inj. Ceftriaxone IV. This shows Inj. Ceftriaxone IV effectiveness and shows no irrational or excessive use is required. Post-operative Antibiotic Administration was discouraged to prevent antimicrobial resistance. No pus was formed in the incision site. Infection control practices and good sterilization also plays its role in the prevention of infection which was ensured in this study. Research and Trials with larger sample size can further help in determining that appropriate use of Antimicrobials can remarkably reduce the resistance.

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