THE EFFICACY OF NORMAL SALINE IRRIGATION TO PREVENT SURGICAL SITE INFECTION

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ABSTRACT

Objective: The aim of the study was to evaluate the efficacy of normal saline irrigations to prevent surgical site infection (SSI).

Study Design: A comparative study.

Place and Duration of Study: The study was conducted at surgery and gynecology Dept CMH Chunian from 1st Jan 2012 to 1st Nov 2012.

Patients and Methods: Two hundred clean surgical and gynecological cases were included in the study. Hundred cases which were randomly selected had their wound washed with warm normal saline for 60 sec and then mopped dry with clean swabs. Subcuticular Stitches were applied to all the 200 cases. The surgical wounds were examined on 3rd post operative day and then finally on 15th post operative day. Patients with wound infection developed pain at the operation site and fever on third post operative day. Wounds were examined for swelling, redness, discharge and stitch abscess. Routine investigations were done as per protocol. Wound swabs were taken for culture and sensitivity.

Results: The study was carried out on 200 clean cases [general and gynecological]. They were 130 females and 70 males. The 100 cases whose wounds were washed with normal saline only 1 patient developed wound infection while in the other group who did not had saline irrigations 8 patients out of 100 developed wound infection. The commonest infective organisms were staphylococcus aureus and the other organisms were streptococcus pyogenes, proteus, Klaebsiella, E coli and pseudomonas. No MRSA was detected.

Conclusion: In our study washing the wound with warm normal saline for 60 seconds resulted in the wound being infection free. Wound infection is associated with delayed wound healing, prolonged hospital stay and increased economic pressure on the patient and on the state

Keywords: Clean cases, Cytotoxic therapy, Normal saline.

INTRODUCTION

Surgical site infection is an infrequent but serious complication of surgery. It can result in prolonged hospital stay and it may compromise ultimate surgical out come[1]. Despite the use of prophylactic antibiotics the surgical site infection continues to occur and is devastating for the patient.

Many methods are available for control of contamination and growth reduction of microorganism[2]. Different methods are dry heat [hot air oven], boiling. Pressurized steam [autoclave] chemical and radiation (gamma rays) hot air oven provides good sterilization but its penetration is low[3]. Autoclave creates pressurized steam which has a high penetration power. Glutaraldehyde is most effective chemical for fine instruments[4].

It is easier to prevent infection than to treat it. Preoperative evaluation of the patient is a prerequisite to rule out underlying risk factors[5]. Many factors are involved in spread of infection . Prophylactic antibiotics given at induction of anesthesia can decrease the spread of infection. Topical antibiotics used alone cannot prevent infection[6].

Diagnosis of post surgical infection is straight forwards in typical cases but in complicated cases such as in obese patients it requires experienced clinical judgment. Diagnosis of surgical site infection is based on constitutional

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symptoms, clinical judgment and laboratory investigations. Such as TLC, DLC, ESR, CRP. Usually the patient develops high grade fever with continuous pain over the operation site. On clinical exam wound is reddish, warm, swollen[7]. Sometimes the wound discharges and stitch abscesses are visible[8]. Biopsy is last resort but is carried out rarely in operative cases.

MATERIAL AND METHODS

We carried out this study between Jan 2012 to Nov 2012. It included 200 clean general and gynecological cases operated in CMH Chunian. There were 100 general surgery and 100 gynecology operations without any modifications in the excisting conditions

Patients of both sexes between 20 and 50 years of age. The patients included both clean cases of general surgery and gynecology were included in the study.

Patients under the age of 10 and over 60 years were excluded from the study. Other exclusion criteria were patients with diabetes mellitus, uremia, jaundice, rheumatoid arthritis, immune compromised patients, patients with malignancy, patients with chronic ill health, bed ridden patients, patients on steroids, patients on cytotoxic drugs, radiotherapy and patients with visceral perforation.

All the patients were operated on selective basis in the theatre reserved for morning list. Clean cases were defined as having intact skin without breakage over the operation site. Prophylactic antibiotics third generation cephalosporin's one gram was given at induction and than one gram two times a day for next 72 hours[9]. In half of these cases which were randomanly selected before closure of the skin wound was washed with warm normal saline for 60 second and then mopped clean with dry swab. All the wounds were closed with subcuticular stitches with prolene.

Wounds were examined on third post operative day and then regularly after removal of stitches till 15th post day. Patients with wound infection developed develop fever and pain at the operation site on 3rd to 4th post op day. Superfical wound infection was clinically detected on examination of wound which showed redness, swlling, warmth and tenderness. Stitch abscess and wound discharge was noted in few cases. All the patients had raised TLC and CPR. Deep infection was detected by high resolution ultrasound. None of the patients required MRI or radioactive scan.

Criteria of Surgical Site Infection (SSI)

- Infection occurs within 30 days of procedure
- Involves only skin or subcutaneous tissue around the incision
- Purulent drainage from the superficial incision
- Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision
- At least one of the following signs or symptoms of infection: pain or tenderness, localized swelling,
- Diagnosis of SSI by the surgeon or attending physician

Management of infected cases was planned according to degree of infection. Superficial infection was treated with removal of stitches and wound dressing and IV antibiotics. Deep infection was treated with thorough wound debridement under general anesthesia and IV antibiotics

RESULTS

We carried out the comparative study of frequency of post op wound infection in those caese in whom normal saline irrigation of the wound as compared to those 100 cases in which no irrigation was done. There were 130 females and 70. Males male to female ratio was 1.3:1. Most patients were between 20 to 50 years of age. All patients were followed for 2 weeks. Evaluation of the patients and wound was done till 15th day. All the patients were assessed regarding pain at the operation site, fever and

wound discharge. The status of the wound was recorded as presences or absence of infection

The patients having discharge at operation site or soakage of dressing was considered as infected. All the other patients whose wounds were healing normally were considered clean. The group with saline irrigation had only one patient who had wound infection while the group which had no saline irrigation had 8 cases of wound infection. Commonly micro organism isolated was Staphylococcus aureus. Other microorganism isolated were streptococcus pyogenes, proteus, klaebsiella, Ecoli, pseudomonas, and Bacteroides fragilis (anaerobes). MRSA was not detected in any patient. The rate of infection was more in that group whose wounds were not washed with normal saline.

DISCUSSION

Experience of surgeon also influences the rate of infection. Soft tissue handling is more delicate with experience while duration of surgery decreases .Both these risk factors help to reduce the rate of infection. Type of the trauma and type of the wound was also very important[5]. Post operative wound infection can be minimized by taking appropriate pre-operative, operative and post operative measures. Pre operative hospital stay should be minimum. Patients should be properly evaluated to rule out foci of infection. Diabetes should be under control. Nutrition status should be evaluated. Prophylactic antibiotics should be given at induction[10]. High standard of sterilization should be maintained through CSSD (central sterilization supply department). Antiseptic skin preparation should be standardized. After taking all these measure there was a need for some measures to reduce surgical site infection (SSI). A number of fluids were tried but some like povidone iodine and spirit were rejected due to their toxicity[5].

Normal saline irrigation is a simple and inexpensive solution with the potential to reduce surgical site infection. In this study we evaluated the comparative incidence of rate of infection following their treatment with warm saline irrigation or no irrigation at all. According to our findings there was quite a difference in wound infection rates among the 2 groups. There are other studies which have used povidone solutions for irrigations but the concept have been abandoned due to fear of toxicity of this solution[11].

CONCLUSION

This study demonstrated that the simple measure of irrigating the surgical wound with warm normal saline reduces the rate of surgical site infection.

Conflict of Interest: This study has no conflict of interest to declare by any author.

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