



EFFICACY OF CHLORHEXIDINE ALCOHOL VS POVIDONE IODINE FOR PRE OPERATIVE SKIN PREPARATION IN REDUCING POST OPERATIVE WOUND INFECTIONS IN PATIENTS UNDERGOING ELECTIVE SURGERIES IN TERTIARY CARE HOSPITAL

General Surgery

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ABSTRACT

Surgical site infection is a dreaded postoperative complication. Although preoperative skin cleansing in order to prevent surgical site infection is standard surgical practice, there is clinical equipoise concerning whether povidone iodine or chlorhexidine alcohol is the antiseptic agent of choice. The present study was conducted on 100 patients to evaluate comparatively the efficacy of chlorhexidine gluconate 2.5% v/v in 70% Ethanol for preoperative skin preparation in comparison with povidone iodine in clean and clean contaminated elective surgeries in department of General surgery in Osmania general Hospital. In the first group, Antiseptic regimen used for preoperative skin preparation is two coats of aqueous povidone iodine IP 5% w/v. In second group, Antiseptic regimen used is single coat of agent containing chlorhexidine gluconate 2.5% v/v in 70% ethanol. The result of culture studies showed that in Group I, 13 cases out of 50 had bacterial growth. In Group II, only 5 cases out of 50 had bacterial growth. This showed that regime II was more effective in reducing postoperative wound infections. This difference was attributed to difference in efficacy of both the antiseptic regimen thus proving regimen II to be significantly more effective in reducing the rate of post operative wound infections

KEYWORDS

chlorhexidine alcohol, povidone iodine, post operative wound infections

INTRODUCTION

Despite many advances in the surgical techniques in the past few years, post-operative wound infection and sepsis still remains a major problem. Although only occasionally a cause of mortality, it is a frequent cause of increased morbidity leading to prolonged hospital stay of the patient. Wound infections occur in approximately 5% of the patients undergoing major abdominal surgery.

The two commonly used antiseptics are chlorhexidine alcohol and povidone iodine. This study is to compare the efficiency of chlorhexidine alcohol and povidone iodine against bacterial flora on the skin of operation site under conditions those encountered in operating rooms. For a long time, it continued to be believed that disease was caused by "Contagion" and spreads by winds and air currents. PVP-Iodine acts as a reservoir that releases iodine as it is used and ensures that "free" iodine is always available and antimicrobial properties of PVP-Iodine are related to non-complexed freely mobile elemental iodine. The efficacy of 2.5 percent chlorhexidine gluconate in 70 percent ethanol in sterilizing the skin has been well established. It was demonstrated that chlorhexidine reduced bacterial colony counts to a greater extent than betadine. Reduction of bacterial skin counts by 80 to 99 percent continued even four hours after initial application. Chlorhexidine has a broad spectrum of activity and is bactericidal on contact like the iodophors. Chlorhexidine is more effective than povidone iodine in diminishing skin colonization with staphylococci in patients before operation. The alcoholic chlorhexidine regimen is simpler and should have wide surgical application.

MATERIAL AND METHODS

Study design : This is a comparative study conducted on 100 patients in two groups.

Settings : Osmania general hospital at Department of General Surgery. Source of data : 100 Patients (50 in each Group) undergoing elective surgery with no focus of infection on the body admitted in the department of General Surgery Osmania general Hospital from December 2017 to December 2019.

INCLUSION CRITERIA:

- 1) patients undergoing elective surgery in department of general surgery in tertiary care hospital.
- 2) patients of age above 15 years of both the sexes

EXCLUSION CRITERIA:

1. The patients undergoing emergency surgery
2. patients of age below 15 years
3. patients with pre op focus of infection on the body
4. patients with malignancy or diabetes mellitus.

METHOD OF COLLECTION OF DATA:

This is a comparative study in which patients will be studied in two groups. In each case preoperatively, detailed history was taken and routine investigation like haemoglobin, total count, differential count, ESR, RBS and chest X-ray were done to rule out diabetes mellitus, any acute or chronic infection or malignancy. This regime had no effect on transient and resident flora on the intact skin before incision and thus microbial colonization of incision site was only affected by antiseptics used for preoperative skin preparation. The pre operative skin preparation in each group is done with the respective antiseptic regimen.

Group I : Antiseptic regimen used for preoperative skin preparation is two coats of aqueous povidone iodine IP 5% w/v

Group II : Antiseptic regimen used is single coat of agent containing chlorhexidine gluconate 2.5% v/v in 70% ethanol.

Post operatively, regular dressing was done with aqueous solution of povidone iodine alone and patients were followed up till the time of sutures removal to look for any signs of wound infection. The data collected in the present study is analyzed statistically by computing the percentages. The difference in mean is tested using z-test and the measures of association between the qualitative variables are assessed using chi-square test. The inference is considered statistically significant whenever $p \leq 0.05$.

RESULTS

The present study was conducted to evaluate comparatively the efficacy of alcoholic solution of chlorhexidine and povidone-iodine for preoperative skin preparation. A total of 100 patients were studied in two groups (50 patients in each group) from December 2017 to December 2019. All the cases were planned for elective surgery. Cases were selected at random irrespective of their age and sex. The nature of operations and therefore site of incisions were variable. The patients were randomly included in either control (group I) or test group (group II) and skin preparation was done with respective antiseptic regimen.

The diagnosis and nature of operations were variable and thus site of incisions also varied and incisions were found all over the body. However all the surgeries were elective.

It is observed within both the groups, the nature of operations and hence site of incision varied but when compared to each other patients in both the groups underwent same type of surgeries and were randomly divided into either a control group (Group I) or test group (Group II). Duration of surgeries varied from 45 mins to 3 hrs and since all the surgeries were elective.

Post operatively patients were followed up to the time of suture removal to know the percent of cases who developed wound infections. The grade of wound infection was determined by Southampton wound grading systems.

It was observed from this study that the proportion of cases infected in Group I was 13(26.0%) where as in case of Group II was 5(10%) and this difference in the proportion of wound infection rate between the two groups is found to be statistically significant ($Z=2.08$, p value is 0.03). This difference is due to difference in efficacy between two antiseptic regimen, thereby making regimen in Group II much more clinically and statistically useful in reducing post operative wound infections.

* $Z=2.08$, p value is 0.03

Comparison of percentage of cases with wound infection in post operative follow up period (till suture removal) in both the groups.

DISCUSSION

There is now increasing evidence that a higher proportion of surgical site infections may be caused by bacteria introduced into deeper skin structures at the time of incision. Proper skin disinfection might, therefore, be one of the keys to reduce the colonization of site of incision and, thus, preventing the development of subsequent infection. This study involved 100 cases which were to undergo clean and clean contaminated elective surgeries. These cases were divided into 2 groups. In Group I, antiseptic regimen used for preoperative skin preparation was two coatings of povidone iodine. In Group II, antiseptic regimen used for preoperative skin preparation was single coat of agent containing chlorhexidine gluconate 2.5% v/v in 70% ethanol.

This study is conducted to compare the efficacy of both the antiseptic regimen by evaluating the rate of post operative wound infections. Patients were selected irrespective of their Age. Age was not the factor to have any implications on results of the study as all the patients had good immune status, had no co-morbid conditions and were planned for elective surgery. Patients were selected irrespective of their Sex. Different sex population was not thought to have any effect on the results. Various studies have been undertaken to compare the efficacy of chlorhexidine alcohol vs povidone iodine. These studies show chlorhexidine alcohol significantly better efficacy than povidone iodine. As for the rate of post-operative wound infection, it is also proven that wound infections are also less if the pre-operative skin preparation is done with chlorhexidine as compared to povidone iodine. The present study compared post operative wound infection rates after using either povidone iodine (Group I) alcoholic chlorhexidine (Group II). The wound infection rate in Group I was 26 % and in Group II it was 10%.

Alcoholic solution of chlorhexidine 2.5% v/v for preoperative skin preparation meets all the qualifications meant for the ideal antiseptic where as povidone iodine alone is less effective.

CONCLUSION

In the first group (Group I), antiseptic regimen used for preoperative skin preparation is two coats of aqueous povidone iodine IP 5% w/v. In second group (Group II), antiseptic regimen used is single coat of agent containing chlorhexidine gluconate 2.5% v/v in 70% ethanol. The result of culture studies showed that In Group I, 13 cases out of 50 had bacterial growth.

In Group II, only 5 cases out of 50 had bacterial growth. This showed that regime II was more effective in reducing postoperative wound infections. Post operatively patients were followed up till the time of suture removal to look for any wound infections. Wound infection was graded by Southampton scoring system. In grade IV infection (pus present), pus culture was taken and antibiotic sensitivity test was done. In Group I, 13 patients had post operative wound infection where as 5 patients in group II had post operative wound infection. This difference was attributed to difference in efficacy of both the antiseptic regimen thus proving regimen II to be significantly more effective in reducing the rate of post operative wound infections

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