



EFFICACY OF TOPICAL ANTIBIOTIC CHLORAMPHENICOL IN PREVENTION OF SURGICAL SITE INFECTION IN POSTOPERATIVE ABDOMINAL WOUNDS.

Dr. B. Moksha Prasuna

MS, Associate professor, Department of General surgery, Osmania medical college, Hyderabad.

Dr. G. Vikram Reddy*

General surgery, Senior Resident, DH King Koti Hyderabad. *Corresponding Author

ABSTRACT

Compared with systemic antibiotic therapy, the topical antibiotic has many potential advantages. In obese patients undergoing abdominal surgery, topical surgical prophylaxis is also proven to be beneficial. The main objectives of this study are to establish the role of topical antibiotic chloramphenicol in prevention of surgical site infection in postoperative abdominal wounds. To establish base line infection rates in post operative abdominal wounds at Osmania Medical College Patients admitted in Emergency department of general surgery in Osmania General Hospital, Hyderabad. Type of study comparative clinical trial. Method of sampling is simple random sampling. Study is performed on 100 patients who underwent emergency laparotomies were randomly divided into Test and Control groups. Statistical significance of difference in occurrence of Surgical site infection in Chloramphenicol and Non-Chloramphenicol groups is being tested using Fisher's exact test with confidence interval of 95%. Single application of topical chloramphenicol to post-operative laparotomy wounds reduces risk of SSI by 18%. Single application of topical chloramphenicol to post-operative laparotomy wounds in diabetic patients may not be effective (P-value 0.3949) in reducing incidence of SSI. Single application of topical chloramphenicol to post-operative laparotomy wounds effectively reduced the incidence of SSI in CDC wound Class-4 (dirty wounds with gross contamination). Single application of topical chloramphenicol to post-operative laparotomy wounds effectively reduced the incidence of SSI in surgeries with mean duration >2hrs.

KEYWORDS : Topical chloramphenicol, surgical site infection, post operative abdominal wounds

INTRODUCTION

Infections that occur in the wound created by an invasive surgical procedure are generally referred to as surgical site infections (SSIs). SSIs are one of the most important cause of Healthcare associated infection (HCAs), second only to Urinary tract infection (UTI) in incidence. SSIs accounted for 14% of these infections and nearly 5% of patients who had undergone a surgical procedure were found to have developed an SSI. SSI develops in at least 5% of hospitalised patients undergoing an operative procedure in developed countries, raising the costs of healthcare both to public and the healthcare delivery system. According to a report by the International Nosocomial Infection Control Consortium (INICC) in 2012, overall 1.4 million people worldwide were suffering from nosocomial infections, and in India alone, the rate was over 25%, with SSI occupying a significant share. SSI can range from a fairly minor wound discharge with no other complication to a life threatening condition. Other outcomes include poor scars that are cosmetically unacceptable and cause psychological stress. SSI . Abdominal surgical site infections are among the most common infectious complications in hospitalised patients and are associated with serious consequences for outcomes and costs. The most severe form may endanger life. Therefore, there is interest in SSI and its prevention amongst surgeons and amongst many other healthcare professionals, because of the increased patient morbidity and the associated financial burden. Surgical practice often includes the use of topical agents applied to the operative site to minimize post-operative surgical infections, especially SSI. Compared with systemic antibiotic therapy, topical or local delivery of an antibiotic has many potential advantages. In a view to reduce the rate of SSI at osmania general hospital, hyderabad, this study is being conducted.

MATERIAL & METHODS

Patients admitted in Emergency department of general surgery in Osmania General Hospital, HYDERABAD.

- 1) Type of Study: Method of sampling is simple random sampling.
- 2) Study is performed on 100 patients who underwent emergency laparotomies were randomly divided into Test and Control groups (each of 50 members).

Statistical Significance:

Statistical significance of difference in occurrence of SSI in Chloramphenicol and Non-Chloramphenicol groups is being tested using Fisher's exact test with confidence interval of 95%.

INCLUSION CRITERIA

- 1) All patients undergoing emergency laparotomies.
- 2) Both males and females of age group >15 years.

EXCLUSION CRITERIA

- 1) The patients with postoperative laparotomy wounds or delayed primary closure.
- 2) patients allergic to topical antibiotics.
- 3) patients with preoperative abdominal wall sepsis
- 4) patients with recent abdominal surgeries with wound site infection.
- 5) patients with age <15 years

METHOD OF COLLECTION OF DATA :

Details regarding Status of laparotomy wound are collected from both Test and Control Groups following emergency laparotomies were recorded in a proforma which included relevant information with regard to history, clinical examination and perioperative management. Data regarding the organisms isolated and their sensitivity patterns is also included, along with the mode of treatment and the outcomes observed on follow-up. Postoperative events are recorded in the data sheet during every day follow up.

After completing the collection of data it is compiled in a systematic way.

Topical Antibiotic selected in study: chloramphenicol ointment 1% w/w

Trade Name: CHLOROMYCETIN APPLICAPS (1% W/W)

Composition: CHLORAMPHENICOL 1% W/W

Type : CAPSULE

Manufacturer: Pfizer

METHODS

Pre-operative phase

After admission short history is taken and physical examination is conducted on each patient. All the necessary information regarding the study is explained to the patients or their valid guardian. Informed written consent is taken from the patients or their guardian willing to participate in the study.

Intra-operative phase:

The surgical team decontaminate their hands with an antiseptic soap and povidone-iodine scrub. Skin preparation was done by the surgeon in all cases. Preparation was done with a povidone-iodine solution, then cleansed with surgical spirit. Sterile drapes were used in two layers.

Strict aseptic precautions will be followed during the operation. Meticulous techniques will be practiced as far as possible. The selected Topical antibiotic (chloramphenicol 1% W/W) will be applied on skin closure edged site for patients in test group.

Post-operative phase:

Sterile dressings were applied over the surgical site and the wound kept covered for 48 hours, after which the dressing was removed with aseptic precautions and the wounds are examined and dressed aseptically daily. When infected, the wound was either laid open or pus let out by removing one or two sutures, cleansed with saline and dressing re-applied. No local antibiotic was applied to the wound again. Broad-spectrum systemic antibiotics, whether oral or parenteral, were continued for a minimum of 5 days post-operatively in all the patients (both test & control groups). During the postoperative period all the patients will be closely monitored everyday up to the discharge of the patient from the hospital.

Patients were followed for up to one month after surgery and the wounds examined clinically for evidence of infection with appropriate investigations being ordered where considered necessary.

RESULTS

The main parameters like Age groups, male to female ratio, no of diabetic patients, CDC wound types, Number of Surgeries with duration <2hrs & number of surgeries with duration >2hrs, which influence the SSI rate in each group are taken in near similar figures to avoid Bias as much as possible .

Table 1.: incidence of SSI in each group

	CHLORAMP HENICOL GROUP	NON- CHLORAMPHE NICOL GROUP	COMBINED
No.OF CASES of SSI	5	14	19
INCIDENCE OF SSI	10%	28%	38%

Results of Statistical significance calculations

Table 2 interpretation of chloramphenicol in study by P-value

Results with Chloramphenicol			
P value and statistical significance			
Test	Fisher's exact test		
P value	0.0395		
P value summary	Less than pre-set value		
One- or two-sided	Two-sided		
Statistically significant (P < 0.05)?	Yes		
Effect size	Value	95% CI	
Relative Risk	0.3571	0.1415 to 0.8714	
Methods used to compute Cis			
Relative Risk	Koopman asymptotic score		
Data analyzed	SSI	No SSI	Total
Chloramphenicol group	5	45	50
Non-Chloramphenicol group	14	36	50
Total	19	81	100

DISCUSSION

Surgical site infection is a common complication following abdominal surgery and is the third most frequent health care associated infection, accounting for serious consequences in terms of morbidity and increased health care costs. The absolute risk of SSI in nonchloramphenicol group is 28%.The absolute risk of SSI in chloramphenicol group is 10%.The absolute Risk Reduction is 18% .This risk difference reflects the additional risk of SSI in patients not receiving chloramphenicol compared with those receiving topical chloramphenicol. In other words, chloramphenicol reduced patients' risk of acquiring SSI by 18%. The Number needed to treat is 100/18=5.55. This means that about 6 patients with risk of acquiring SSI needed to receive the topical chloramphenicol in order to prevent one of them from acquiring SSI. The relative risk in study is 10/28=0.357 This relative risk indicates that the probability of SSI in those receiving topical chloramphenicol is about one third of that of those who are not receiving chloramphenicol. The P-value obtained in the study is 0.0395 which is less than pre-set value of 0.05 indicates that the difference of clinically observed SSI in both groups (Chloramphenicol & Non chloramphenicol group) is attributed to use of Topical Chloramphenicol.The P-value obtained in difference between SSI rates in Diabetic and non-diabetic is 0.3949 which is more

than significant level of 0.05, indicates that Difference of SSI rates among diabetic patients is not attributed to application of Topical chloramphenicol. The overall combined incidence of SSI in both groups in present study 38% (non-chloramphenicol group 28%, Chloramphenicol group 10). The most common age group developing SSI was > 60 years. In the present study, SSI rates among males is 20.48 and among females is 11.76 with no statistical significance. The most common co-morbidity was Diabetes Mellitus, the rate of SSI among diabetics is 52.3% and among non-diabetics is 8.98% which is statistical significant. The P-value obtained in difference between SSI rates in Diabetic and non-diabetic is 0.3949 which is more than significant level of 0.05, indicates that Difference of SSI rates among diabetic patients is not attributed to application of Topical chloramphenicol. The highest incidence of SSI as per wound classification occurred in Dirty wounds in both groups (Class-4) cases which is (32%-combined,14 out of 43), (19% in chloramphenicol group 45% in Non-chloramphenicol group.

CONCLUSIONS

The following conclusions were drawn from the present study Single application of topical chloramphenicol to post-operative laparotomy wounds reduces risk of SSI by 18%.Single application of topical chloramphenicol to post-operative laparotomy wounds in diabetic patients may not be effective (P-value 0.3949) in reducing incidence of SSI. Single application of topical chloramphenicol to post-operative laparotomy wounds effectively reduced the incidence of SSI in CDC wound Class-4 (dirty wounds with gross contamination. Single application of topical chloramphenicol to post-operative laparotomy wounds effectively reduced the incidence of SSI in surgeries with mean duration >2hrs.

REFERENCES

- Smyth ET, Mellvenny G, Enstone JE, et al. Four Country Healthcare Associated Infection Prevalence Survey 2006: overview of the results. *Journal of Hospital Infection* 2008;69:230—48.
- Bayat A, McGrouther DA, Ferguson MW. Skin scarring. *British Medical Journal* 2003;326:88—92.
- Coello R, Charlett A, Wilson J, et al. Adverse impact of surgical site infections In English hospitals. *Journal of Hospital Infection* 2005;60:93—103.
- Neumayer L, Hosokawa P, Itani K, et al. Multivariable predictors of postoperative surgical site infection after general and vascular surgery: results from the patient safety in surgery study. *Journal of the American College of Surgeons* 2007;204:178—87.
- Kaye KS, Schmit K, Pieper C, et al. The effect of increasing age on the risk of surgical site infection. *Journal of Infectious Diseases* 2005;191:1056—62.
- Friedman ND, Sexton DJ, Connelly SM, et al. Risk factors for surgical site infection complicating laminectomy. *Infection Control and Hospital Epidemiology* 2007;28:1060
- Latham R, Lancaster AD, Covington JF, et al. The association of diabetes and glucose control with surgical-site infections among cardiothoracic surgery patients. *Infection Control and Hospital Epidemiology* 2001; 22:607-12.
- Abboud CS, Wey SB, Baltar VT. Risk factors for mediastinitis after cardiac surgery. *Annals of Thoracic Surgery* 2004;77:676-83.
- Olsen MA, Butler AM, Willers DM, et al. Risk factors for surgical site infection after low transverse cesarean section. *Infection Control and Hospital Epidemiology* 2008;29:477-84.
- Gravante G, Araco A, Sorge R, et al. Postoperative wound infections after breast reductions: The role of smoking and the amount of tissue removed. *Aesthetic Plastic Surgery* 2008;32:25-31.