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COMPARE THE OUTCOME(SURGICAL SITE INFECTION) OF WOUND IRRIGATION WITH ANTIBIOTICS (METROGYL AND GENTAMYCIN)VS NORMAL SALINE IN CLEAN CONTAMINATED AND CONTAMINATED WOUNDS.

Surgery

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ABSTRACT

Surgical infection , particularly surgical site infection has always been a major complication of surgery and trauma and has been documented for 4000- 5000 years. An Understanding of the cause of infection came in the nineteenth century . Microbes had been seen under microscope, but Koch's first laid down the first definition of infective disease (Koch's postulate). For many years surgeons trying to overcome this problem but it is still prevalent approximately 30 to 40 % in contaminated wounds. Ignac Semmelweis showed that puerperal sepsis could be reduced from 10 % to under 2% by the simple act of hand washing between the cases. Introduction of antibiotics for prophylaxis and treatment , together with advances in Anaesthesia has resulted in reduced SSI significantly but it is still a problem in contaminated and dirty wounds. As in our study we studied the comparison of infection rate between irrigation with normal saline and antibiotics in clean contaminated and contaminated wounds . As there is no significant difference between both , and antibiotics have a risk of antibiotic resistance and allergic problems , it should not be neglected .So we can use normal saline as an irrigation fluid as no significant benefit of using antibiotic is seen.

KEYWORDS

surgical site infection, wound irrigation, Antibiotic solution

INTRODUCTION :

Surgical infection , particularly surgical site infection has always been a major complication of surgery and trauma and has been documented for 4000- 5000 years. An Understanding of the cause of infection came in the nineteenth century. Microbes had been seen under microscope, but Koch's first laid down the first definition of infective disease (Koch's postulate). For many years surgeons trying to overcome this problem but it is still prevalent approximately 30 to 40 % in contaminated wounds. Ignac Semmelweis showed that puerperal sepsis could be reduced from 10 % to under 2% by the simple act of hand washing between the cases. Introduction of antibiotics for prophylaxis and treatment , together with advances in Anaesthesia has resulted in reduced SSI significantly but it is still a problem in contaminated and dirty wounds. So we want to study role of wound irrigation in prevention of surgical site infection in clean contaminated and contaminated wounds. Wound irrigation is the steady flow of a solution across an wound surface to achieve wound hydration , to remove deeper debris , surface pathogens and to assist with visual examination . Although saline irrigation can succeed in removing debris , foreign material and blood clots , which contains bacteria , from a surgical wound , it does not suffice to eliminate bacterial contamination. Irrigation with antibiotic solutions has been used for prevention or treatment of infections in several settings and patient population worldwide . However a critical review of literature does not provide supportive evidence for the use of this technique . Randomised clinical trials will be needed to obtain data regarding the effectiveness and toxicity of antibiotic for irrigation .Until ,such data are available , this mode of administration of antimicrobial agents may be not justified , except for patient with empyema following lobectomy or pneumonectomy . For this purpose antibiotics have been instilled directly into wounds or used in irrigation solution.The use of topical antibiotics , instead of antiseptics solutions, has the advantage of avoiding tissue destruction caused by antiseptics .

REVIEW OF LITERATURE

The Hippocratic teachings described the use of antimicrobials such as wine and vinegar which were widely used to irrigate open , infected wound before delayed primary and secondary wound closure.

Galen recognised that localisation of infection(suppuration) in wound inflicted in the gladiatorial arena often heralded recovery, particularly after drainage (pus bonum et laudabile) later on Theodoric of Cervia , Ambroise Pare and Guy de Chaulic observed that clean wounds , closed primarily, could heal without infection or suppuration.

In 1977, Halasz [1] analysed data obtained in 13 experimental studies and 19 prospective and retrospective clinical studies , It was concluded that the application of carefully selected topical antibiotics to surgical wounds , particularly those with a high risk for development of infection , diminished significantly the associated infection rate. However in 2001, Anglen[2]considered that ,although antibiotic irrigation appeared to be effective in experimental studies with some type of animal wounds , human clinical data were unconvincing because of poor study design.Several models have been used to investigate the pathophysiology of surgical wound infection. Casten et al [3] conducted experiments in which incisions made in rabbit muscle were first contaminated with bacteria and then treated topically by irrigation with different solutions . While 93% of wound irrigated only with saline became infected ,irrigation with penicillin -containing solution reduce the infection rate to 10% .

Lord et al [5] showed that the rate of in –hospital wound infection in 685 patients without antibiotic lavage was 0.73% ,compared with 0% among 760 patients whose wounds was irrigated with antibiotic solution(p0.024).

Clean contaminated and contaminated surgical procedures: Chralambous et al [6] sought to determine whether topical ampicillin reduce the rate of wound infection in clean contaminated or contaminated surgical procedure such as appendicectomy and colorectal surgery. Based on meta-analysis of data from the MedLine and Cochrane data bases it was concluded that topical ampicillin reduce the infection rate in clean contaminated and contaminated wounds significantly compared with no antimicrobial prophylaxis. Singer et al [7] compared irrigation pressures attained by human volunteers ,using various techniques .Unfortunately ,impact of irrigation pressure on the wound surface was not measured, only that at the pressure transducer in a closed system ,not representative of clinical wound irrigation . Moesgaard et al [8] conducted a randomised , controlled clinical trial, in which 190 patients with peritonitis at the time of abdominal surgery were studied. One group of patients was treated with systemic antibiotics only ,while a second group of patients received systemic antibiotic treatment combined with topical application of antibiotics in the wound at the time of wound closure .However, no significant difference was found between the two treatment groups with respect to the rate of wound infection.

AIMS AND OBJECTIVES :

Our primary objective is :

1. To compare wound infection (SSI) in contaminated /clean contaminated surgical procedures after wound irrigation with

antibiotics v/s normal saline.

METHODOLOGY:

1) Patients will be randomly assigned to each group i.e. wound irrigation with antibiotic and normal saline. (200ml solution each after rectus sheath closure) Then we will follow patient regarding wound infection in both groups (at 3rd ,7th ,30th day)

Sample size-It includes patients coming to emergency department and operated in emergency operation theatre at BPSGMC, Khanpur Kalan ,Sonepat.

Criteria :

1) Inclusion : all patients of age 16-65 yrs coming to emergency department and operated in emergency OT in BPS GMCW.
2) Exclusion: patients of age > 65 yrs, hypertension , diabetes and any immunocompromised patient.

Both samples will be statistically seen using Chi square test

RESULTS:

Comparison of contaminated wound after irrigation with antibiotics vs normal saline for surgical site infection (Table 1).

Contaminated wound sample :

Wound	Irrigation with antibiotics & %	Irrigation with Normal Saline & %	P Value
Infected	17	21 (42%)	0.41
Non Infected	33 (67%)	29 (58%)	Not Significant
TOTAL	50	50	100

Although Statistically not significant but Descriptively significant so study needs to be extended for further evaluation

Comparison of clean contaminated wound with antibiotic and normal saline (Table 2)

	Irrigation with Antibiotics & %	Irrigation with Wash & %	P value
Infected	7 (14%)	8 (18%)	0.078
Non Infected	43 (86%)	42 (82%)	Not Significant
TOTAL	50	50	100

There is no difference seen between the two groups i.e, samples with normal saline irrigation versus samples with antibiotic irrigation .

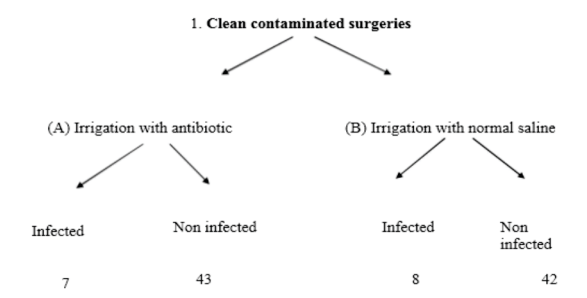
Comparison of wound irrigation with antibiotic vs normal saline (Table 3)

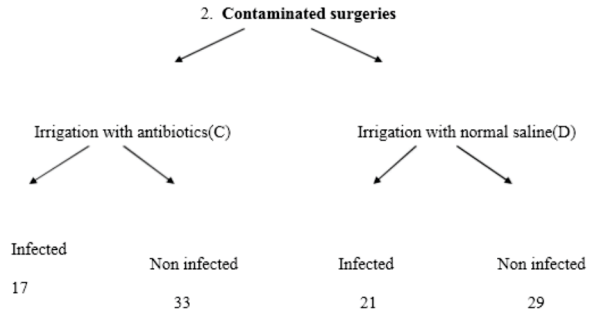
BOTH CONTAMINATD AND CLEAN CONTAMINATED :

	Irrigation with Antibiotics & %	Irrigation with Saline & %	P Value
Infected	24 (24%)	29(29%)	0.423
Non Infected	76 (76%)	71(71%)	Not significant
Total	100	100	200

DISCUSSION :

SSI remains major problems for surgeons worldwide and major complication of surgery and trauma and has been documented for 4000-5000 years (9). Various Techniques have evolved over time to prevent SSI live; highest level of evidence based medicine suggest that peri-operative avoidance of hypothermia and supplemented oxygen during recovery can significantly can reduce the rate of SSI . There is undisputed evidence that prophylactic antibiotics are effective in clean contaminated operations and contaminated operations . But in this study ,we are studying effect of local wound irrigation on SSI among clean contaminated and contaminated surgeries .





CONCLUSION :

There are no clinically important differences in infection rate between wounds irrigated with normal saline or antibiotic solution . This review considers the data available from various experimental and clinical studies in order to provide an update on the use of antibiotic containing solutions has been suggested to be beneficial in the prevention of infection in several settings and patient populations. No firm ,evidence based recommendations can be made regarding its use until additional data from well designed randomised clinical trials become available.

Surgical wound irrigation has been debated as a potentially critical intra-operative measure taken to prevent the development of surgical site infections(SSI).Unlike many other SSI prevention efforts ,there are no official practice guidelines or recommendations from any major medical group for the practice of surgical irrigation .As a result , practitioner implementation of the three major irrigation variable can differ significantly .

SSI remains to be one of the most frequent infectious complication following surgery . Wound irrigation is a steady flow of a solution across an open wound surface to achieve wound hydration , to remove debris and surface pathogen contained in wound exudates or residue from topically applied wound care products . Compared to swabbing or bathing wound irrigation is considered to be the most consistently effective method of wound cleansing . Choosing an appropriate solution is a critical step in wound irrigation . Solutions intended for topical use include topical cleansers , antibiotics , anti-fungals ,antiseptics and anaesthetics . Ideally an irrigant should be isotonic , non haemolytic ,non toxic, transparent, easy to sterilise, and inexpensive . Many antiseptics and antibiotics have been employed but the ideal additive is still the subject of debate .

As in our study we studied the comparison of infection rate between irrigation with normal saline and antibiotics in clean contaminated and contaminated wounds . As there is no significant difference between both , and antibiotics have a risk of antibiotic resistance and allergic problems , it should not be neglected .So we can use normal saline as an irrigation fluid as no significant benefit of using antibiotic is seen.

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