Journal of Medical Sciences

ISSN 1682-4474

science alert

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Research Paper

JMS (ISSN 1682-4474) is an International, peer-reviewed scientific journal that publishes original article in experimental & clinical medicine and related disciplines such as molecular biology, biochemistry, genetics, biophysics, bio-and medical technology. JMS is issued four times per year on paper and in electronic format.

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J. Med. Sci., 4 (3): 203-205
July-September, 2004

A Randomized Double Blind Clinical Trial of Prophylactic Single Dose Intravenous Cefazoline on Prevention of Wound Infection in Traumatic Laceration

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This study was performed for evaluation of efficacy of single dose intravenous Cefazoline administration in prevention of wound infection. In a randomized double blind clinical trial two hundred with traumatic laceration without background disease in Kashan Naghavi Hospital were studied. After first visit with one of the researcher and irrigation and suturing, the patients were received either one gram Cefazoline or placebo randomly. Second visit was performed by one surgeon after removing sutures and wound was examined for infection. Each group had three patients with infection. There was not any statistically significant difference between two groups for wound infection, age, job, location and size of laceration. Present data suggested single dose intravenous Cefazoline administration did not differed with placebo. It is better antibiotics are prescribed in special conditions and some wound considerably with clinical judgment.

Key words: Wound infection, antibiotic, Cefazoline, prophylaxis

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INTRODUCTION

Infection is the most common complications of traumatic wounds and lacerations[1]. A noticeable part of health care expenditure is allocating for prevention and treatment of infections. Wound infection rates for clear wound are 1.5-3.9% and for clear-contaminated lacerations are 3-4%[2]. Antibiotic prophylaxis have the major effort for preventing of infection in traumatic injury which generally are prescribed orally, but sometimes drugs are not consumed in many causes. So single dose administration in emergency room is one of the important major goals of physician in infections prevention. Although many clinical and para clinical surveys have not demonstrated the effect of prophylactic antibiotics on wound care but another recommend it.

Page *et al.*[3] confirmed that injectable antibiotics were useful for prevention of wound infection. They used Cefazoline as for drug prophylaxis. Slattery *et al.*[4] suggested in the clean operation prophylactic antibiotic among surgery and twenty four month followed up was useful.

Even-though this study was designed to evaluate effect of single dose Cefazoline intravenously in emergency room for infection prevention of traumatic lacerations.

MATERIAL AND METHODS

A randomized double blind clinical trial was designed. Cohort of 200 cases with traumatic unclean traumatic laceration that were coming to emergency room of Kashan Naghavi hospital were selected.

The goal of study were explained for every patients and they satisfied to enter the study. After expressing patients consent, wound was examined by one researcher, cleaned and debrided. Subcutaneous tissue were sutured by Chromic cut gut string and skin were sutured by nylon.

Then cases were divided randomly to two groups. Group one received one gram Cefazoline (Darou Pakhsh Ins. Iran) intravenously (IV) and second group was injected as the same volume injectable water as placebo. All wounds were dressed in the same conditions and were visited 2 days later by second researcher-a surgeon-and followed up seven to ten days and were visited and evaluated again. Clinical criteria for wound infection consist of:

1- Wound tenderness
2- Redness more than one centimeter
3- Induration more than 0.5 cm
4- Purulent wound
5- Dehiscence
6- Regional lymphangitis
7- Fever

After clinical evaluation and data registration analysis were done by EPI-6 software and used Chi square test for categorical variable. ANOVA test was used for continuous data and Kruskal-Wallis test as nonparametric test.

RESULTS AND DISCUSSION

A cohort of two hundred cases had been matched from an age and sex points. There were three cases with wound infection in each group separately and no significant difference was between two groups (Fig. 1).

Other variable like job of patients, size, location and depth of laceration did not play any role in infection incidence (Table 1).

Usage of prophylactic antibiotics for minor traumatic laceration is controversial yet. Many authors have emphasized on ABs administrations for prevention of traumatic wound even though surgical incisions. However wound infections have decreased in recent years and ABs are used in many center[5-8].

Total infection in recent study was 6 cases an equally in two groups. It is acceptable for our center. Cefazoline was ineffective for prevention in this way.

Loudwig and coworkers demonstrated prophylactic ABs could deduct post traumatic or post operative wound infections. They determined cleaned-contaminated wound and prosthesis replacement operation were the major indication for ABs prophylaxis[9].

Page and collegiuos studied on prophylaxis of post operative wound infections by Cefazoline. They concluded it was useful for deduction of post surgical morbidity; length of hospital admission even though costs of hospitalization[3]. The other frequent studies which have worked on ABs prophylaxis, recommended it for major laceration and wound or great surgical procedure only[4, 10-12].

Table 1: Comparison of clinico-demographic factors in two groups

	Kind of treatment			
	Cefazoline		Placebo	
	Infection			
Factor	Yes	No	Yes	No
Kind of injury				
Superficial injury	3	94	3	82
Profound injury	0	3	0	12
Open facia	0	0	0	3
Job				
Students	0	38	1	37
Employee	0	2	0	1
Workers	2	15	0	15
Housewife	1	11	1	13
Business	0	9	0	16
Location				
Upper Limb	3	42	1	33
Lower Limb	0	7	2	12
Head and Neck	0	48	0	49
Trunk	0	0	0	2

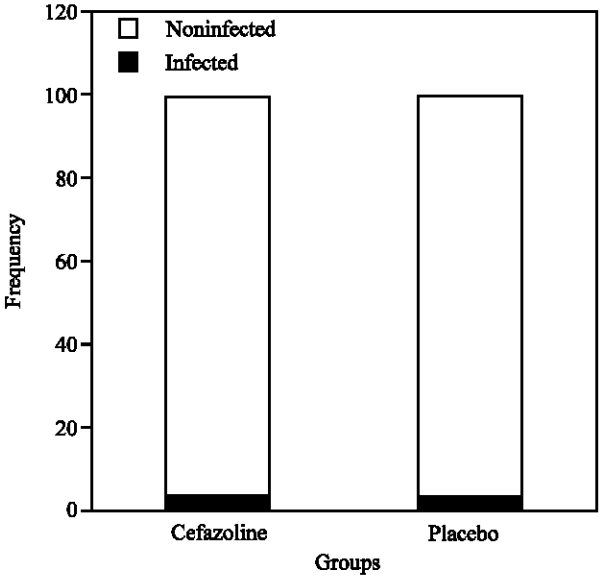

Fig. 1: Comparison of infection in two groups
$\chi^2 = 0.17$, df = 1, P.v = 0.68

It was demonstrated IV Ceftriaxon as a prophylactic AB played an important role to reduce morbidity after traumatic laceration and post surgical wound infection[13-20].

It could be suggested that a single dose of IV Cefazoline was useful for prevention of wound infection, it was better than Ceftriaxon because of Ceftriaxon is more expensive than Cefazoline and it is not cost benefit neither patients nor hospital managers.

Present data did not show any relationship between demographic factors like job of patients, size, location and depth of laceration with infection incidence. It is possible wound infection related to patients individual factors like activity of immune system and underling activity or disease. It is important that using of ABs have to indicate in special conditions with exact inclusion criteria and every injury does not need AB.

More studies are recommended on Cefazoline and evaluate cost-effectiveness and cost-benefit of this method for prevention of wound infections in different conditions.

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