

## PREOPERATIVE SCRUBBING OF OPERATIVE SITE; AN EFFECTIVE MODALITY TO PREVENT SURGICAL SITE INFECTION

### Cerrahi yara yeri enfeksiyonlarını önlemede etkin bir yöntem; Preoperatif ameliyat yeri temizliği.

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#### ABSTRACT

Surgical site infection (SSI) is a real thought of concern in postoperative patients. In our study, we use preoperative scrubbing of the operative site to reduce SSI. In our study we use preoperative scrubbing in 55 patients, among which 5 (9.09%) developed SSI. We did not apply the same in other 50 patients and among them 24 (48%) developed SSI. In 60 patients with clean wound we use preoperative scrubbing in 30 patients and none of them developed SSI. The rest 30 patients with clean wound who did not receive preoperative scrubbing 12(40%) developed surgical site infection. In 45 cases of clean contaminated wound we use preoperative scrubbing in 25 patients, among them 5 (16%) developed SSI. The rest 20 patients with unscrubbing group developed SSI in 12 (60%) patients. In 10 diabetic patients we applied preoperative scrubbing in all of them and 4(40%) of them developed SSI.

In conclusion, It has been seen that performing a preoperative surgical scrubbing for 2-3 minutes using an appropriate antiseptic can reduce the chance of SSI.

**Key words:** Surgical site infection, preoperative scrubbing, and prevention.

#### ÖZET

Cerrahi yara yeri enfeksiyonları ciddi bir problem olmaya devam etmektedir. Çalışmamızda, yara yeri enfeksiyonunu azaltmak için ameliyat öncesi dönemde yara yeri temizliği (preoperative scrubbing) yapıldı. Çalışmaya yaşları 18-45 arası 105 hasta dahil edildi. Bu şekilde temizlik yapılan 55 hastadan 5'inde (%9.09) yara yeri enfeksiyonu gelişti. Ameliyat öncesi yara yeri temizliği yapılmayan 50 hastamızın 24'ünde (%48) yara yeri enfeksiyonu gelişti. Yarası temiz olarak Kabul edilen 60 hastanın 30'unda preoperative temizlik yapıldı, kalan 30 hastada ise yapılmadı. Temizlik yapılan hastaların hiçbirinde enfeksiyon görülmezken, temizlik yapılmamış hastaların 12'sinde (%40) enfeksiyon gelişti. Temiz-kontamine yarası olan 45 hastanın 25'inde preoperative temizlik yapıldı ve bunların 5'inde (%20) enfeksiyon gelişirken, temizlik yapılmayan 20 hastanın 12'sinde (%60) enfeksiyon gelişti. Diyabetik 10 hastanın hepsinde preoperatif yara yeri temizliği yapıldı ve hastaların 4'ünde (%40) yara yeri enfeksiyonu gelişti.

Sonuç olarak, ameliyat öncesi dönemde yara yerinin temizliği enfeksiyonları azaltmada önemli bir rol oynamaktadır.

**Anahtar kelimeler:** Cerrahi yara yeri enfeksiyonu, ameliyat öncesi yıkanma ve korunma.

#### INTRODUCTION

Surgical site infection (SSI) is a remarkably expensive luxury. India has consistently shown higher

rates of SSI. In spite of implementation of preoperative preventive measure, surgical site infection is a nightmare in all surgical departments. Since

skin is a major source of pathogen, it is conceivable that improving skin antisepsis would reduce the rate of surgical site infection. In our study we tried to examine the role of preoperative antisepsis of the operative site over incidence of surgical site infection.

It is a retrospective observational study performed in the surgical wards of Calcutta National Medical College and Hospital. We aimed to evaluate the exact role of preoperative antisepsis of operative site in prevention of surgical site infection, and to reduce the unpredicted cost of medication in post operative patients.

### MATERIALS AND METHODS

We reviewed 105 patients undergoing operation in any site of body either in the emergency or elective operation theatre from May 2009 to Dec 2010. We include only clean and clean-contaminated surgery (performed under controlled conditions without substantial spillage or unusual contamination). All patients are between 18-45 years. Among 105 patients, preoperative scrubbing were done in 55 patients with savlon, 10% povidone-iodine, and 70% isopropyl alcohol. Rests were operated without

preoperative scrubbing. Prophylactic antibiotic were given in all patients 1 hour before.

Exclusion criteria were; H/o allergy to chlorhexidine-alcohol or iodophores. Evidence of infection at or adjacent to operative site. Perceived inability to follow the patient's course for 30 days after surgery.

Preoperative culture sensitivity of the proposed operative skin site has been done in all patients. Clinicobacteriological follow up of the surgical wound were done from POD 3 up to 30 days after surgery to the development of surgery to the development of surgical site infection as per CDC (The Centers for Disease Control and Prevention) criteria. Wound swab sent for culture and sensitivity if wound infection were suspected.

Preoperative evaluation included medical history taking, physical examination, blood for fasting blood sugar, hemoglobin level, albumin level and other biochemical parameters (having role in surgical site infection). We have considered all risk factors in every patients. In all patients performance level Karnofsky score were >90. ASA scoring were grade I and II.

<b>Table 1: Demographic status of patients (n=105).</b>		
	Status	No of patients
Diabetic condition	Diabetic	10
	Non-diabetic	95
Age limits	18-25 yrs	60
	25-35 yrs	30
	35-45 yrs	15
Smoking habit	Non-smokers	80
	Smokers	25
Type of wound	Clean	60
	Clean-contaminated	45
Type of operation	Elective	60
	Emergency	45
Presence of malnutrition	Yes	90
	No	15
Obesity status	Obese	30
	Non-obese	75

### RESULTS

Among 55 patients, who underwent preoperative scrubbing of the operative site, 4 patients developed superficial SSI and 1 patient developed deep SSI. Among 50 unscrubbed patients 15 patients developed superficial SSI and 9 patients developed deep SSI.

We have seen that patients with clean wounds have less chance of developing SSI when scrubbed preoperatively. At the same time patients with clean contaminated wound has more chance of developing SSI when not scrubbed preoperatively though preoperative scrubbing does not guaranty the

safety of not developing SSI in these group of patients.

Among 24 patients who developed SSI and not scrubbed preoperatively culture showed *Staphy-*

*lococcus aureus*, Gram (-) organisms and Enterococcus. Among 5 patients who developed surgical site infection following preoperative scrubbing wound swab revealed gram negative organisms.

<b>Table 2: Incidence of Surgical site infection.</b>				
Condition	Preoperative Scrubbing (n)	Superficial SSI n (%)	Deep SSI n (%)	No SSI n (%)
Diabetic n=10	+ (10)	3 (30%)	1 (10%)	6 (60%)
Non-diabetic n=95	+ (45)	1 (2.2%)	0	44 (97.8%)
	- (50)	15 (30%)	9 (18%)	26 (52%)
Age (18-25 years) n=60	+ (25)	2 (8%)	0	23 (92%)
	- (35)	12 (34.2%)	3 (8.5%)	20 (5.7%)
Age (26-45 years) n=45	+ (30)	2 (6.6%)	1 (3.3%)	27 (90%)
	- (15)	3 (20%)	6 (40%)	6 (40%)
Clean wounds n=60	+ (30)	-	-	30 (100%)
	- (30)	12 (40%)	-	18 (60%)
Clean-contaminated wounds n=45	+ (25)	4 (16%)	1 (4%)	20 (80%)
	- (20)	3 (15%)	9 (45%)	8 (40%)
Obese patients n=30	+ (24)	3 (12.5%)	1 (4.1%)	20 (83.3%)
	- (6)	2 (33.3%)	4 (66.6%)	0
Non-obese patients n=75	31	1 (3.2%)	-	30 (96.7%)
	44	13 (29.5%)	5 (11.4%)	26 (59%)

## DISCUSSION

Postoperative surgical site infections (SSIs) are a major source of illness to a surgery patient (1). The Centers for Disease Control and Prevention (CDC) term for infections associated with surgical procedures was changed from surgical wound infection to surgical site infection in 1992 (2). Following the work of Haley and colleagues investigators at CDC reported on a composite risk index used in the National Nosocomial Infections Surveillance System. This risk index was based on a modification of the one developed in the Study on the Efficacy of Nosocomial Infection Control project (3). The consistent and correct administration of AMP is the most effective method to reduce the risk of acquiring an SSI in indicated Class I (clean) or Class II (clean-contaminated) surgeries. Preoperative antiseptic skin preparation to reduce infection-causing microorganisms is recommended for the 27 million patients in the United States undergoing surgery each year. According to a survey of registered nurses, there is a significant gap between the Association of perioperative Registered Nurses antiseptic skin preparation guidelines and actual practice that is putting patients at risk for surgical site infections (SSIs) (4). In a prospective study, Umesh and his

colleagues had shown that the overall SSI rate was estimated to be 30.7%; 5.4% for clean, 35.5% for clean-contaminated and 77.8% for contaminated operations. Seventynine per cent of the isolates were gram-negative and almost 64% demonstrated polyantimicrobial resistance in their institution in Goa (5).

It has been seen that performing a preoperative surgical scrubbing for 2-3 minutes using an appropriate antiseptic can reduce the chance of SSI (6). Early studies demonstrated the utility of chlorhexidine-based soaps and hand scrubs; a natural extension of use of this agent lies in the field of preoperative baths and skin preparation for surgical patients. Postoperative surgical site infections (SSIs) are frequently caused by a patient's own skin flora, including those microorganisms that colonize body sites other than the surgical site. Similar to hand washing with chlorhexidine, whole-body bathing with chlorhexidine significantly reduces microbial burden on the skin (7), and repeated baths lead to a progressive reduction of organisms over time (8). Implementing preoperative antiseptic cleansing with 2% chlorhexidine postoperative SSI can be reduced significantly (9). In another study using preoperative chlorhexidine it has been shown that SSI rate can be

reduced from 7.5% to 1.2%,  $P < .001$ , relative reduction of 84%. (10).

In conclusion, preoperative scrubbing of the patient's skin with antibacterial agents is an effective modality for preventing surgical site infection.

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