

Original Article

Role of pre-operative shower with common soap to prevent postoperative wound infection in routine and emergency Laparotomy

DOI: dx.doi.org

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Received: 01 OCT 2022

Accepted: 10 OCT 2022

Published: 14 NOV 2022

Published by:

Sheikh Sayera Khatun Medical College, Gopalganj, Bangladesh



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ABSTRACT

Background: In different research studies and meta-analysis, it has been already established that preoperative shower with Chlorhexidine has protective role to prevent and reduce surgical site infections. However, in many guidelines, including the National Institute of Health and Care Excellence (NICE) guideline, UK, the role of showering is not recommended. **Aims & objectives:** The aim of this research is to depict the role of preoperative showering to reduce surgical site infections. **Methodology:** This was a prospective study with a total 308 patients of Laparotomy in Khulna Medical College Hospital, Bangladesh, from January 2016 to December 2020. Convenient purposive sampling was the sampling method. Ethical clearance was taken individually from patient and from the ethical review committee of Khulna Medical College Hospital. **Results:** Among the total 308 patients, 240 and 62 patients had emergency and routine Laparotomy respectively. 18.8% patients with emergency laparotomy (Group A) had surgical site infections, whereas 6.4% patients with routine laparotomy had surgical site infections. According to the Southampton wound grading system, in Group A, surgical site infections were either deep or organ space infections (Grade IV or V), whereas, in Group B, all infections were superficial (Grade II). In case of routine surgery, where the patients had a shower preoperatively at the day or before the day of operation, wound infection was nil. When the patients had no shower within 05 days prior to emergency surgery, the infection rate was 8.8%. And when the patients had a shower within 2-5 days prior to surgery, the infection rate was 7.1%. The patients who had a shower 01 day before surgery or at the day of surgery, the infection rates were 2.1% and nil respectively. **Conclusion:** Taking shower with common soap before surgery reduces the rate of surgical site infections. Shower prior to or at the day of surgery

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greatly influences the overall infective outcome. Therefore, shower and its timing is an important factor in relation to both routine and emergency surgery.

Keywords: *Surgical sites infection, shower, timing, emergency, routine, laparotomy.*

(The Insight 2022; 5(1): 24-29)

INTRODUCTION

According to the United States Center for Disease Control guideline, 1999, surgical site infections are infections which occur within 30 days of surgery at the site of operation, however, in case of implant surgery, the duration is one year following operation^{1, 2}. Surgical wound infections continue to consume a considerable portion of health care finance. Even though the complete elimination of wound infections is not possible, a reduction of the observed wound infection rate to a minimum level could have marked benefits in terms of both patient comfort and resources used³. With the infection rate for clean wounds being inherently low, these indeterminate categories can comprise a significant proportion of wounds that are not clearly infected or uninfected and may skew data in any study of infection rates. Partly in order to address this problem of no uniform definitions, The Surgical Wound Infection Task Force, including representatives from the Society for Hospital Epidemiology of America, the Association for Practitioners in Infection Control, the Centers for Disease Control, and the Surgical Infection Society, published in 1992 definitions of surgical site infections^{3, 4}. In many recent studies, the role of preoperative showering has been linked up with the surgical site

infections⁵⁻⁸. In a study it has been depicted that showering preoperatively with chlorhexidine gluconate is an issue that continues to promote debate; however, many studies demonstrate evidence of surgical site infection risk reduction. Methodological issues have been present in many of the studies used to compile guidelines and there has been a lack of standardization of processes for application of the active agents in papers pre-2009. This review and commentary paper highlights the potential for enhancing compliance with this low-risk and low-cost intervention and provides some guidance for enhancing implementation of preoperative showering with both chlorhexidine in solution and impregnated wipes^{5, 9, 10}. In our current research our aim is to link up the surgical site infection with the timing of shower with common soap before operation in Khulna Medical College Hospital, Bangladesh.

METHODOLOGY

This study was conducted as a prospective study with a total 308 patients of Laparotomy from January 2016 to December 2020 in Khulna Medical College Hospital, Bangladesh. Among the study population, 240 laparotomies were done as emergency procedure (Group A) and 62 laparotomies were done as routine

procedure(Group B). Study population was selected by convenient purposive sampling based on inclusion and exclusion criteria. The survey data were usually be analyzed using both analytic as well as descriptive statistic. Such as; mean, SD, percentage etc. Ethical clearance was taken individually from patient and from the ethical review committee of Khulna Medical College

Hospital.The Southampton wound grading² system was applied to assess the surgical site infections in study population.

RESULTS

The age and sex distribution of the Group A and B are shown in table 1& 2 respectively.

Age group (Years)	Male			Female		
	N	%	Mean±SD	N	%	Mean±SD
<30	12	05	45±1.7	07	2.9	49±2.0
30-39	25	10.4		18	7.5	
40-49	35	14.6		27	11.3	
50-60	41	17.1		20	8.3	
>60	30	12.5		25	10.4	
Total	143	59.6		97	40.4	

Table 1: Age and sex distribution of study population in Group A.

Age group (Years)	Male			Female		
	N	%	Mean±SD	N	%	Mean±SD
<30	02	3.2	54±2.1	00	00	50±1.5
30-39	03	4.8		04	6.5	
40-49	08	12.9		12	19.4	
50-60	07	11.3		06	9.7	
>60	10	16.1		10	16.1	
Total	30	48.4		32	51.6	

Table 2: Age and sex distribution of study population in Group B.

The overall wound infection rate in both groups is depicted in figure 1.

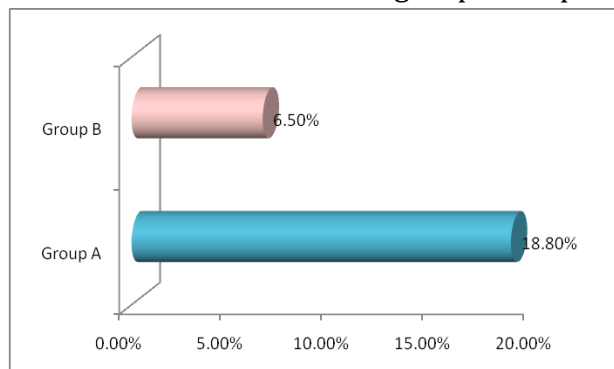


Figure 1: Wound infection rate in both study groups.

Using the Southampton wound grading system², the overall grade of surgical

site infections in Group A and B is shown in table 3.

Grade	Group A		Group B	
	N	%	N	%
Ia	00	00	00	00
Ib	02	0.8	00	00
Ic	02	0.8	00	00
IIa	01	0.4	02	3.2
IIb	00	00	02	3.2
IIc	05	2.1	00	00
IId	03	1.3	00	00
IIIa	08	3.3	00	00
IIIb	07	2.9	00	00
IIIc	07	2.9	00	00
IIId	02	0.8	00	00
IVa	04	1.7	00	00
IVb	04	1.7	00	00
V	10	4.2	00	00
Total	45	18.8	04	6.5

Table 3: Southampton wound grading system of surgical site infections in both study groups.

Among the 45 and 04 cases of wound infection, the timing of taking shower prior to surgery is shown in figure 2.

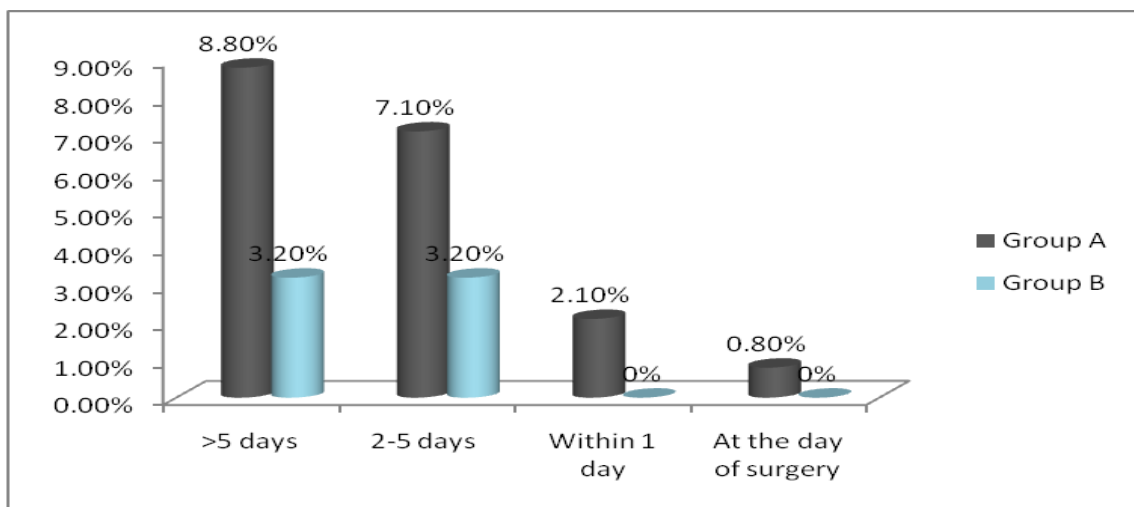


Figure 2: Approximate timing of shower among the patients with wound infection.

DISCUSSION

Among the 240 patients of emergency laparotomy (Group A), 59.6% (143) and 40.4% (97) patients were male and female respectively. In case of male patients, 17.1% (41) were in 50-60 years of age group, followed by 14.6% (35) were in 40-49 years of age group. On the other hand, in the female patients, majority of the patients (11.3%, 25) were within 40-49 years of age group, followed by 10.4% (25) were in age >60 group. Mean±SD age was 45±1.7 and 49±2.0 years respectively in male and female group. During the study period, a total number of 62 patients of elective laparotomy were included (Group B), among which 48.4% (30) were male and 51.6% (32) were female patients. Majority of the male patients (16.1%, 10) were in >60 years of age group, whereas in case of female most of the patients (19.4, 12) were in 40-49 years of age group. Mean±SD age was 54±2.1 and 50±1.5 years respectively in male and female group.

In case of emergency laparotomy (Group A), 18.8% (45 out of 240) patients had surgical site infections, whereas among the patients with routine Laparotomy, 6.4% (04 out of 62) patients had surgical site infections. The Southampton wound grading system² is a widely accepted tool to assess and categorize surgical site infections. Using this tool in case of both study groups, it was observed that in case of Group A, in most patients, surgical site infections were either deep or organ space infections (Grade IV or V). On the contrary, in Group B, all infections were superficial (Grade II).

The most important finding of this research was that incidence of infection in relation to timing of shower with common soap in emergency and elective laparotomy. The results were suggestive that in case of routine surgery, where the patients had a shower preoperatively at the day or before the day of operation, wound infection was absolutely nil. On the contrary, a major portion of the patients were unable to have a shower before the operations due to their illness. As a result, when the patients had no shower within 05 days prior to emergency surgery, the overall infection rate was 8.8% (21 patients), whereas when the patients had at least one shower within 2-5 days prior to surgery, the infection rate was 7.1% (17 patients). But when the patients had a shower at least 01 day before operation, the infection rate was 2.1 % (05 patients). When the shower was possible on the day of operation even in case of emergency surgery, the infection rate was found nil. The observation suggests that surgical site infections have strong relationship with the timing of shower prior to surgery, which is major problem in case of emergency surgery as a result of severe illness.

The use of a pre-admission shower with 2% or 4% aqueous chlorhexidine gluconate (CHG), to reduce skin contamination prior to surgery, has been addressed in the 1999 US Centers for Disease Control and Prevention (CDC) Hospital Infection Control Practices Advisory Committee (HICPAC) document, Guideline for the Prevention of Surgical Site Infection⁵. However, the National Institute of Health and Care Excellence (NICE) of the UK, in its

guideline on prevention and treatment of SSI, have not strongly recommended bathing or showering with CHG. Moreover, some evidence-based analysis, including that presented in the NICE guideline, does not support the routine use of pre-admission whole-body cleansing or showering with CHG⁵.⁶ But our study strongly supports the role of preoperative showering to reduce surgical site infections in surgical practice.

CONCLUSION

Surgical site infections are unavoidable but preventable scenario in many circumstances. The incidence is higher in emergency surgery, mostly are deep and organ space infections. Showering prior to surgery and the timing of shower greatly influence the incidence of surgical site infections, reflected in this research.

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