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Surgery

Evaluate Wound Healing Time and Infection Control Measures

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Abstract | **Original Research Article**

Background: Wound healing has been intensively explored in order to find a "ideal" treatment that achieves rapid recovery while minimizing scarring, hence preserving function. ***Aim of the study:*** The goal of this study was to evaluate wound healing time and infection control measures. ***Methods:*** This observational study was conducted for six months at the Department of Surgery, Sir Salimullah Medical College, and Mitford Hospital in Dhaka. Patients who had superficial surgical site infections after surgery were included in the study. After screening, 200 patients were included. Following the dressing, the topical drug (L-lysine HCL 15% gel) was administered once on days 3, 8, and 13. All patients were followed for a maximum of two weeks. Data on the patient's demographic profile, wound healing, granulation tissue appearance, and overall outcome were collected and documented on a premade and pretested data collection sheet. The data was analyzed with SPSS (Statistical Package for Social Science) (Trail Version). ***Results:*** The study population had an average age of 34.43±8.73, with about equal male and female ratios. At the third post-operative day (POD) after surgery, granulation tissue had not formed in 86% (n=172) of the cases and had only partially formed in 14% (n=28). All of them received a thick layer of L-lysine, and on the eighth postoperative day, 92% (n=184) had produced partial granulation tissue, while 3% (n=6) had reached complete healing. At the 13th POD, 91.5% (n=183) of the patients experienced complete wound healing, while the remainder experienced partial wound healing. The study also assessed patients' satisfaction with wound healing, finding that 91% were satisfied, 4% were very satisfied, and the remainder were unsatisfied with the effect of L-lysine. ***Conclusion:*** L-lysine shortens the time it takes for granulation tissue to form and speeds up wound healing. However, additional clinical trials are needed to determine the significance of L-lysin as a possible drug for surgical site infection treatment.

Keywords: Wound healing, L-lysine, infection control.

INTRODUCTION

Wound healing has been extensively studied in order to identify a "ideal" treatment that achieves quick recovery with minimizing scarring, hence preserving function. Many patients experience postoperative wound infections, often known as surgical site infections (SSIs), which hinder their rehabilitation. SSIs can be characterized as superficial/incisional if limited to the skin and subcutaneous tissue, deep incisional when including the fascia and muscle, or organ space when involving a bodily cavity (e.g. abdominal cavity following gastrointestinal surgery) [1, 2]. Although the majority of SSIs are minor, some can be severe and difficult to treat, such as necrotizing deep soft tissue infections [3]. Wound dressing is an old skill that has evolved throughout time, from traditional herbal treatment to current dressing materials. The primary goal was always to repair the wounds. Wounds and their care are the most fundamental aspects of surgery. Various treatment strategies have been developed over the years in the form of different types of wound dressings such as creams, ointments, solutions, occlusive dressing, non-occlusive dressing, absorptive dressing, and negative suction vacuum dressings [4, 5]. Wound infections or surgical site infections are estimated to occur after 1%-3.1% of all surgical procedures and responsible for roughly 2% of hospital-acquired infections mortality [6, 7]. In abdominal surgery, the rate of wound infection may be significantly greater, with numerous studies suggesting a 15% to 20% prevalence depending on the level of contamination [8, 9]. In comparison to other

prevalent nosocomial infections, wound infections (21.8%) and pneumonia (21.8%) were the most commonly reported, followed by gastrointestinal (17.1%), urinary tract (12.9%), and bloodstream infections [10]. An ideal wound care product should protect normal tissues while simultaneously controlling infection and without interfering with regular wound healing. This amino acid is essential, which means that humans cannot produce it. L-Lysine has been found to stimulate therapeutic angiogenesis in wound healing [11]. Lysine is accessible in an ointment form. Lysine can be taken in the form of tablets, capsules, or liquids. Even though Lysine supplements are available over the counter, they should be taken during herpes outbreaks rather than on a regular basis [1].

METHODOLOGY

This six-month observational study was carried out at the Department of Surgery, Sir Salimullah Medical College, and Mitford Hospital in Dhaka. Patients with superficial surgical site infections following surgery were included in the study. Following screening, 200 patients were included. The topical medicine (L-lysine HCL 15% gel) was given once on days 3, 8, and 13 after the dressing was removed. Each patient was monitored for a maximum of two weeks. Data on the patient's demographic profile, wound healing, granulation tissue appearance, and overall outcome were gathered and reported on a prefabricated and pretested data collecting sheet. The data were analyzed using SPSS (Statistical Package for Social Science) (Trail Version).

RESULT

Table-1 reveals that the study population had an average age of 34.43±8.73, with approximately equal male and female ratios. Table-2 shows that 46% of respondents were overweight, 16.5% were obese, 12.5% were underweight, and 23% were normal weight, with only 2% having morbidity weight. Table-3 reveals that 70.5% of surgeries lasted more than 2 hours, whereas 29.5% lasted less than 2 hours. Table-4 shows that 96.5% of respondents' culture and sensitivity tests were positive, whereas 3.5% had a negative culture and sensitivity test. Table-5 demonstrates that 86% of respondents' granulation tissue did not form on the third day following surgery, whereas 14% had partially formed. Table-6 illustrates the eighth day of surgery. 92% of respondents' granulation tissue was partially developed, 5% was not formed, and 3% was fully formed. Table-7 displays the 13th day of surgery. Wound healing was completed in 91.5% of respondents, whereas just 8.5% had their wounds partially healed. Table-8 reveals that 91% were satisfied, with 4% being extremely satisfied with the effect of L-lysine. Aside from that, just 4% were unsatisfied with the effect of L-lysine, with 1% rating it as average.

Table-1: Distribution of the respondents by sociodemographic profile (N=200)

Sociodemographic profile	Frequency (n)	Percentage (%)
Age (years)		
20 to 32 years	95	47.5
33 to 43 years	57	28.5
44 to 54 years	45	22.5
55 to 65 years	2	1.0
above 65 years	1	.5
Mean±SD	34.43±8.73	
Sex		
Male	101	50.5
Female	99	49.5

Table -2: Distribution of the respondents by BMI (N=200)

BMI	Frequency (n)	Percentage (%)
Underweight <18.5 kg/m²	25	12.5
Normal weight (18.5 to 24.99 kg/m²)	46	23.0
Over weight (25 to 29.99 kg/m²)	92	46.0
Obese (30 to 34.99 kg/m²)	33	16.5
Morbidity obese ≥ 35	4	2.0
Total	**200**	**100**

Table-3: Distribution of the respondents by duration of the surgery (N=200)

Duration	Frequency (n)	Percentage (%)
<2 hour	59	29.5
>2 hour	141	70.5
Total	**200**	**100**

Table-4: Distribution of the respondents by wound swab C/S (N=200)

C/S	Frequency (n)	Percentage (%)
positive	193	96.5
Negative	7	3.5
Total	**200**	**100**

Table-5: Distribution of the respondents by granulation tissue formation at 3rd day of surgery (N=200)

Granulation tissue formation	Frequency (n)	Percentage (%)
Partially formation	28	14
No formation	172	86
Total	**200**	**100**

Table-6: Distribution of the respondents by granulation tissue formation at 8th day of surgery (N=200)

Granulation tissue formation	Frequency (n)	Percentage (%)
Partially formation	184	92
No formation	10	5
Full formation	6	3
Total	**200**	**100**

Table-7: Distribution of the respondents by wound healing at 13th day of surgery (N=200)

Wound healing	Frequency (n)	Percentage (%)
Complete wound healing	183	91.5
Partially wound healing	17	8.5
Total	**200**	**100**

Table-8: Distribution of the respondents by satisfaction level of using L-lysine (N=200)

Satisfaction level	Frequency (n)	Percentage (%)
Dissatisfied	8	4
Average	2	1
Satisfied	182	91
very satisfied	8	4
Total	**200**	**100**

DISCUSSION

This was an observational study conducted at the Surgery Department of Sir Salimullah Medical College and Mitford Hospital in Dhaka. The study aimed to assess wound healing time and infection control strategies. This study included a total of 200 respondents. 47.5% of respondents were between the ages of 20 and 32, 28.5% were 44 to 54 years old, 22.5% were 33 to 43 years old, 1% were 55 to 65 years old, and just 0.5 were over the age of 65. The average age of the responders was 34.43±8.73 years. 50.5% of responders were men, while 49.5% were women. In a prior study, there were 607 patients with a mean age of 45 years, and 53% of them were male [12]. Another study found that the average age of the patients in the study was 44.69 (SD=19.16), with more than half (68.4%) being male [13]. In this study, 29.5% of the surgeries lasted more than 2 hours, whereas 70.5% took less than 2 hours. Long-term surgery has been shown to increase the risk of infection. Similar findings were seen in a prior investigation, when 80.8% of the isolates came from procedures lasting more than 2 hours and 19.2% from surgeries lasting less than 2 hours 40. In this study, 46% of respondents were overweight, 16.5% were obese, 12.5% were underweight, 23% were normal weight, and just 2% had morbidity weight. In a previous study, they discovered that the risk factors associated with superficial SSIs (BMI > 25, diabetes, alcohol, dyspnea, and chronic pulmonary obstructive disease) were also associated with changes in vascularization or decreases in skin oxygenation and wound healing, and the study found that a BMI of >30 was significantly associated with developing an SSI [3]. In this study, 37.5% of respondents stayed in the hospital for 3 to 5 days after surgery, 38% for 6 to 10 days, and 24.5% for 11 to 15 days. Another study found that SSIs prolong hospitalization. Each SSI results in more than one week of extended postoperative hospital stay [4]. Another study found that patients with SSI had a 3.61-day longer average postoperative stay than those without SSI (11.53 days vs 7.92 days) [14]. In this study, it was also discovered that 96.5% of respondents' culture and sensitivity tests were positive, whereas 3.5% had negative culture and sensitivity tests. In a prior investigation, they found that two of the 28 isolates obtained were culture negative (7.14%) [15]. Most wounds require one to three weeks to heal. In this study, 86% of respondents' granulation tissue did not form by the third day of surgery, whereas 14% had it partially formed. Furthermore, on the eighth day of surgery, 92% of respondents' granulation tissue was partially formed,

5% of respondents' granulation tissue was not created, and 3% of respondents' granulation tissue was fully developed. On the thirteenth day of surgery, Wound healing was completed in 91.5% of respondents, whereas just 8.5% had their wounds partially healed. In this study, 91% were satisfied and 4% were extremely satisfied with the effect of L-lysine. Aside from that, just 4% were unsatisfied with the effect of L-lysine, with 1% rating it as average. Overall, 91.5 percent of respondents were satisfied with the use of L-lysine. Surgical site infection is one of the most prevalent major postoperative consequences (World Health Organization- WHO, 2009) and is classified as a healthcare-associated infection. It has a devastating impact on patients in terms of morbidity and death, as well as increased expenses for both patients and hospitals. L-lysine HCl has significantly improved the rate and quality of wound healing. The chemical provides qualitatively superior and significantly faster wound healing, with less scarring and deformity.

Limitation of the study:

This was a single-center study with a limited sample size. As a result, the study's findings may not accurately reflect the overall state of the country.

Conclusion & Recommendation

According to the study results, L-lysin plays a beneficial function, as around 91% of patients experienced complete wound healing by the 13th day of surgery. L-lysine shortens the time it takes for granulation tissue to form and speeds up wound healing. However, additional clinical trials are needed to determine the significance of L-lysin as a possible drug for surgical site infection treatment.

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