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An Assessment Scale For Patients With Postoperative Superficial Incisional Surgical Site Infection.

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ABSTRACT

Any superficial surgical incision (SSI) may cause redness, delayed healing, fever, pain, tenderness, warmth, or swelling in postoperative state. These are some signs and symptoms for specific types of SSI: A SSI may produce pus from the wound site as well as leads to other complications. A cross-sectional study was conducted at the Department of Surgery in last one year. A sample of 100 patients was randomly selected. We calculated our sample based upon a research conducted to identify risk factors. We included 100 patients in present study of which, 22 had surgical site infection, whereas the remaining 78 patients had no infection. The current study presents the developed scale which consists of three parts, corresponding to the perioperative phases. We concluded that the developed assessment scale for patients at risk of surgical site infection has good accuracy in distinguishing between patients at risk of superficial incision SSI and those without. The scale is quick to administer, simple, and easy to use, but we cannot rely on it to diagnose SSI because of its low predictive value, but can be used as a guide or as an additional tool.

Keywords: assessment scale, superficial surgical incision

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INTRODUCTION

Any superficial surgical incision (SSI) may cause redness, delayed healing, fever, pain, tenderness, warmth, or swelling at postoperative state [1]. These are some signs and symptoms for certain types of SSI: In some pus may ooze from the wound site. For wounds that heal by primary intention, the most important assessment factors include the approximation of the wound edges (the edges of the wound fit together well), drainage (a closed incision should not have drainage), signs of infection, and the presence of palpable healing, etc [2]. This assessment should include intraoperative history and postoperative instructions, circulatory volume status, respiratory status, and cognitive status. Wound healing proceeds in four phases: Hemostasis, Inflammation, Proliferation, and Remodelling, and the appearance of the wound changes as the wound heals [3]. The postoperative portion of the scale includes body temperature, presence of drain(s), day of drain removal, type of sutures, and length of hospital stay (days) as postoperative risk factors. The four wound classifications available in the NHSN application are: Clean (C), Clean-Contaminated (CC), Contaminated (CO), and Soiled/Infected (D). Herein, we evaluated the scale for patients with postoperative superficial surgical incision at the surgical site in a cross-sectional study [4, 5]. The aim of this study was to evaluate the predictive power of a rating scale for identifying patients at risk of superficial incision SSI as well as prepare assessment scale tools.

MATERIAL AND METHODS

A cross-sectional study was conducted at the Department of Surgery in last one year. A sample of 100 patients was randomly selected. We calculated our sample based upon research conducted to identify risk factors.

Patients were undergoing general surgeries that had clean closed and sutured surgical wounds were included in present study while patients associated with complications were excluded from present study.

Patient's written consent to be included in the study was obtained after the explanation of the purpose of the study.

Scale Development Process

The assessment scale for patients at risk of superficial surgical incisional surgical site infection was constructed using the process of scale development proposed by Slavec and Drnovšek [1].

According to this process, three phases were carried out by the authors as follows.

Phase I- Domain Specification

Phase II- Pilot Test

Phase III - statistical analysis for estimate the relation between different variables and the presence or absence of wound infection.

The four wound classifications available within the NHSN application are: Clean (C), Clean-Contaminated (CC), Contaminated (CO), and Dirty/Infected (D).

Risk factors for SSIs

- Having other medical problems or diseases.
- Being an elderly adult.
- Being overweight.
- Smoking.
- Having cancer.
- Having a weak immune system.
- Having diabetes.

We included 100 patients in present study of which 22 had surgical site infection, whereas the remaining 78 patients had no infection was found in our study.

The current study presents the developed scale which consists of three parts, corresponding to the perioperative phases.

The preoperative part of the scale includes preoperative risk factors which are the patient's age, smoking, body weight, taking corticosteroids, antibiotic prophylaxis, site of surgical operation, associated diseases etc.

The postoperative part of the scale includes body temperature, presence of drain(s), day of drain removal, type of sutures, and length of hospital stay (days) as postoperative risk factors.

Table 1: Assessment scale validity with variables in present study (Based on percentage)

Study variable	Wound infection Present (N=22)	Percentage
Body mass index (Higher i.e more than 25)	11	11
Diabetics	7	7
Hypertension	4	4
Lengthy hospital stay (more than 10 days)	6	6
Other medical issues	16	16
Smoking / nicotine addiction	5	5
Weak immune system	9	9

Table 2: Assessment scale validity with variables - divided on operative state

Study variable	Variable state	Wound infection Present (N=22)	Percentage
Body mass index (Higher i.e more than 25)	Preoperative	11	11
Diabetics	Preoperative	7	7
Hypertension	Preoperative	4	4
Lengthy hospital stay (more than 10 days)	Postoperative	6	6
Other medical issues	Preoperative	16	16
Smoking / nicotine addiction	Preoperative	5	5
Weak immune system	Preoperative	9	9

Table 3: Grade wise classification of SSI (Details has been explained in discussion)

Grade	Number of patients (N=22)	Percentage
Grade A Score 0-2	7	7
Grade B Score 3-6	10	10
Grade C Score 7-10	5	5

DISCUSSION

Surgical site infections are serious complications that can lead to adverse patient outcomes, such as increased hospital length of stay, increased healthcare costs, and even death. Globally, there is a need to reduce the morbidity associated with SSI. The importance of surgical wound assessment and documentation in reducing SSI complications is increasingly recognised. Evidence-based guidelines have been published internationally highlighting recommended practises.

SSIs have major consequences as limiting the potential benefits of surgical interventions and increasing the economic burden on hospitals. Adding to the functional disability and emotional stress of the patient, the increased length of stay for infected patients is the greatest contributor to cost. The increased use of drugs, the need for isolation, and the use of laboratory and other diagnostic studies also contribute to costs. For patients with wound infection, studies showed that the average increase in duration of hospitalization was 8.2 days [6-8].

A wide variety of assessment tools are used to facilitate assessment. Scales are considered as an effective method which can provide an accurate scoring system. Scales are important in identifying patients who are critically ill and therefore at risk [9]. Thus prompting the implementation of therapy to improve modifiable conditions. Superficial incisional SSI is one of the most common postoperative complications, occurring in at least 5% of all patients undergoing surgery and 30–40% of patients undergoing abdominal surgery.

Assessment of patients with postoperative superficial incisional surgical site infection (SSI) requires a systematic approach to gather relevant information about the patient's health status, surgical procedure, and the extent of the SSI. To aid in this process, healthcare professionals use various assessment scales to measure the severity of the SSI and guide treatment decisions. Here is an example of an assessment scale that can be used for patients with postoperative superficial incisional SSI:

Wound Appearance: Assess the appearance of the wound, looking for signs of inflammation, redness, swelling, warmth, discharge, and odor.

- 0: No evidence of inflammation, redness, swelling, warmth, discharge, or odor.
- 1: Mild inflammation, redness, swelling, warmth, discharge, or odor that can be controlled with topical therapy.
- 2: Moderate inflammation, redness, swelling, warmth, discharge, or odor that requires systemic antibiotics and wound care.
- 3: Severe inflammation, redness, swelling, warmth, discharge, or odor that requires surgical intervention.

Pain: Assess the patient's level of pain related to the SSI.

- 0: No pain or discomfort related to the SSI.
- 1: Mild pain or discomfort that can be controlled with oral analgesics.
- 2: Moderate pain or discomfort that requires stronger oral analgesics.
- 3: Severe pain or discomfort that requires intravenous analgesics.

Drainage: Assess the amount and type of drainage from the wound.

- 0: No drainage from the wound.
- 1: Minimal serous or sanguineous drainage that does not require dressing changes.
- 2: Moderate serous or sanguineous drainage that requires frequent dressing changes.
- 3: Copious purulent or seropurulent drainage that requires surgical intervention.

Systemic Symptoms: Assess the patient's overall health status and the presence of systemic symptoms related to the SSI.

- 0: No systemic symptoms related to the SSI.
- 1: Mild systemic symptoms, such as low-grade fever, malaise, or nausea.
- 2: Moderate systemic symptoms, such as high-grade fever, chills, or vomiting.
- 3: Severe systemic symptoms, such as hypotension, tachycardia, or confusion.

Based on the scores for each category, the severity of the SSI can be classified as follows:

Score 0-2: Mild SSI.

Score 3-6: Moderate SSI.

Score 7-10: Severe SSI.

This assessment scale can be used to monitor the patient's progress and guide treatment decisions for postoperative superficial incisional SSIs. However, it is important to note that each patient's case is unique, and healthcare professionals should use their clinical judgment when interpreting the scores and determining the best course of treatment [10].

CONCLUSION

We concluded that the developed assessment scale for patients at risk of surgical site infection has good accuracy in distinguishing between patients at risk of superficial incision SSI and those without. The scale is quick to administer, simple, and easy to use, but we cannot rely on it to diagnose SSI because of its low predictive value.

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