



A PROSPECTIVE STUDY OF SURGICAL SITE INFECTIONS IN ABDOMINAL SURGERIES OF ADULTS.

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ABSTRACT

Background: Surgical site infections (SSIs) are infections that develop in the incision, organ, or space following surgery(1). In 1992, the term surgical site infection' (SSI) replaced surgical wound infection(2).

Surgical site infection (SSI) is a common consequence from surgery and trauma. According to the World Health Organization's (WHO) Clean Care is Safer Care program, up to one-third of surgical patients experience surgical site infections (SSI). Surgical site infections (SSIs) increase postoperative hospital stays by 7-10 days and increase the risk of death by 2-11 times compared to non-SSI surgical patients. {3,4} Surgical site infection is a post-surgery infection in the affected area of the body Surgical site infection is also defined as occurring within 30 days of the operation. The CDC's NNIS system has established standardised surveillance criteria to identify SSIs. These parameters categorise SSIs as either incisional or organ/space. Incisional SSIs are classified as superficial (including only skin and subcutaneous tissue) or deep (involving deeper soft tissues within the incision). Organ/space SSIs refer to any portion of the body that was opened or altered during surgery, excluding incised body wall layers. **Wound Healing:** Cutaneous wound healing involves epithelial renewal and the creation of connective tissue scar. Skin wounds heal by either first or second intention, depending on their size and character.

Wound healing phases include the

1. Inflammatory
2. Proliferative phases.
3. Remodelling phase (maturation phase).

Factors affecting wound infection include host response, virulence and inoculum of the infective agent, vascularity and health of the invaded tissue (including local ischaemia and systemic shock), presence of dead or foreign tissue, and antibiotic use during the 'decisive period'. Dose of bacterial contamination *pathogenicity = risk of surgical site infection. Resistance of the host patient. A surgical site infected with more than 105 germs per gramme of tissue significantly increases the risk of SSI. **Methods:** The Prospective study was conducted between March 2023 and February 2025 and comprised 24 cases, regardless of age group(adults), of both males and females who had been operated for elective & emergency abdominal surgeries in a surgical ward. Appropriate surgical management was carried out under strict aseptic precautions. Immediate Post operative period of the patients was followed up. Wound was examined on day 2, then every day till the day of discharge.

Used to gather the following information:

Discharge form suture site suggesting superficial SSI

Wound Gaping

Swab used to collect Pus for culture & sensitivity pattern

Results: This study included 20 patients: 6(30%) females and 14 (70%) males, with a mean age of 50 years (range 35-65). The average hospital stay was 7 days, In our investigation, 8 patients were diagnosed with diabetes and were on medication. There were no new diagnoses in our study. In our investigation, four of the twenty patients were smokers. The majority of surgical wounds in our study were cleanly infected. For 14 surgeries, the surgery lasted more than two hours. Twelve patients had a post-operative stay of three to seven days. Eight patients had extended hospital stays. **Conclusion:** Surgeons, infection control practitioners, health planners, and the general public now recognise surgical site infection as a quality indicator of patient care. In comparison to the industrialised world, our environment continues to have a high incidence of SSI. In order to develop strategies that will promote a decrease in the rate of wound infections, our study forces us to examine the weaknesses in our surgical and infection control procedures. Reducing the preoperative hospital stays can lower SSI.

KEYWORDS : Surgical Site Infection, Abdominal Surgeries, Diabetes Mellitus, Smoking.

INTRODUCTION:

An infection that develops in the area of the body where surgery was performed is referred to as a surgical site infection. Sometimes, surgical site infections are merely superficial skin infections. More serious surgical site infections might affect organs, subcutaneous tissues, or implanted materials.

An infection that develops within 30 days following surgery and affects the skin and subcutaneous tissue of the incision (superficial incisional), the deep soft tissue (such as muscle or fascia) of the incision (deep incisional), or any portion of the anatomy (such as organs and spaces) other than the incision that was opened or altered during an operation (organ/space) is also referred to as a surgical site infection.

Factors affecting a wound's ability to heal:

The wound's location and the structures involved

The wounding mechanism includes incision, crushing, and crushing avulsion.

Tissue loss due to contamination (bacteria/foreign substances)

Additional local elements arterial or venous vascular insufficiency, prior radiation exposure, and pressure

Systemic variables include smoking, diseases like diabetes mellitus, medications like steroids, immunological deficits like chemotherapy or AIDS, and malnutrition or vitamin and mineral shortages.

Factors influence whether a wound will become infected:
Response of the host
Virulence and inoculum of the infectious agent

The presence of dead or foreign tissue,

The vascularity and health of the invading tissue (including local ischaemia and systemic shock), and

The presence of antibiotics during the "decisive period"

SURGICAL SITE INFECTION RISK FACTORS:

Patient-related factors: Ascites (for abdominal surgery), persistent inflammation, and problematic corticosteroid therapy Diabetes, obesity, age extremes, and hypoxaemia For lower extremities surgery, peripheral vascular disease and postoperative anaemia Recent surgery Previous site irradiation Infection from a distance Staphylococci can be carried by the skin or nose. Psoriasis and other skin conditions in the infected area Undernutrition.

Environmental Factors:

Medications that are contaminated
Insufficient cutaneous antisepsis,
inadequate disinfection/sterilization
inadequate ventilation

Treatment Elements:

Drains

Emergency surgeries

Hypothermia

Insufficient prophylactic use of antibiotics

Controversial oxygenation □

Extended hospitalisation prior to surgery Extended duration of surgery

MATERIALS AND METHODS:

This study covered 20 individuals, both male and female, who had been operated for elective & emergency abdominal surgeries in a surgical ward, regardless of age category (Adults), and was carried out at Department of General Surgery, KIMS, Amalapuram between March 2023 and February 2025.

Used to gather the following information:

- Discharge form suture site suggesting superficial SSI
- Wound Gaping
- Swab used to collect Pus for culture & sensitivity pattern

Patients had been admitted. An intravenous antibiotic was administered 30 to 60 minutes before to the start of procedure. Strict aseptic precautions were taken during the appropriate surgical care. The patients' immediate post-operative time was monitored. On day two, and thereafter daily until the day of discharge, the wound was checked. SSI symptoms were sought after. If the patient experienced SSI during this time, the kind of SSI was identified, and a swab culture was obtained to determine the pattern of antibiotic sensitivity and microorganism.

RESULTS:

This study included 20 patients: 6(30%) females and 14 (70%) males, with a mean age of 50 years (range 35-65). The average hospital stay was 7 days. In our investigation, 8 patients were diagnosed with diabetes and were on medication. There were no new diagnoses in our study.

In our investigation, four of the twenty patients were smokers. The majority of surgical wounds in our study were cleanly infected. For 14 surgeries, the surgery lasted more than two hours. Twelve patients had a post-operative stay of three to seven days. Eight patients had extended hospital stays.

Seven individuals who developed SSI had an extended

postoperative stay. Of the seven patients who developed SSI, six had superficial SSI. One had organ space SSI. No patients experienced deep incisional SSI.

DISCUSSION:

Large number of studies reported surgical site infection in abdominal surgeries between 3.4% and 36.1% (5). In our study out of 20 patients who underwent abdominal surgeries, 4 patients developed SSI. The rate of SSI in our study is 20%. This is comparable to many studies in India (5,6) and is higher compared to developed countries and less as compared to few Indian studies (7). This is due to the fact that in developed countries they have a systematic feedback of SSI rate and surveillance bodies such as hospitals in Europe Link for Infection Control through Surveillance (HELICS) in Europe and National Nosocomial Infection Surveillance System (NNIS) in United States of America whereas in our country we rely mainly on sporadic surveys.

The majority of patients in our study were between 35 and 65 years old, with a male preponderance. Our study found that smoking, a pre-operative stay of more than 3 days, an ASA score, a contaminated or dirty wound, operation duration, and drain insertion duration were all risk factors for SSI. Our investigation found no correlation between SSI and BMI grading, anaemia, or hypoalbuminemia. Our investigation demonstrated a link between smoking and SSI, consistent with earlier findings.

Patients with ASA classes 2 and 3 have a higher risk of developing SSI. This is similar to prior investigations. The infection rate in class II patients is 28.1%, whereas in class III it is 50%. Contaminated and filthy wounds were related with SSI in our study (8,9), as have other investigations. Surgery that lasts more than two hours is significantly related with SSI. Our findings are consistent with those of other investigations. When patients have surgery for more than two hours, the infection rate is 20%. In our investigation, no patients underwent surgery for less than 2 hours and developed SSI.

The most prevalent illness condition encountered in our study was acute appendicitis with or without abscess, and the most common surgical technique observed was an emergency open appendectomy. SSI was more typically found in appendicular abscess and duodenal perforation. SSI was found on the fourth and fifth postoperative days. No patients got SSI after being discharged from the hospital. Most infections are caused by the endogenous flora. Our study found that opening the gastrointestinal system increases the presence of Gram-negative bacteria. The most often isolated organism was *E. coli*. It was identified in 50% of the swab cultures. This is comparable to the findings of Amit Agarwal et al. and Lul raka et al (10,11). *Pseudomonas* and *Proteus mirabilis* were the next most common species isolated.



Image:1 Discharge From Surgical Site S/O-SSI.



Image:2 Suture Site Gapping.



Image:3 SWAB For PUS Culture & Sensitivity.

DIABETES	NUMBER OF SUBJECTS	PERCENTAGE
YES	8	40%
NO	12	60%
SMOKING	NUMBER OF SUBJECTS	PERCENTAGE
YES	4	20%
NO	16	80%
DURATION OF SURGERY	NUMBER OF SUBJECTS	PERCENTAGE
>2HRS	14	80%
<2HRS	6	20%

Limitations:

Only surgeries on the abdomen were covered. The surgery department's other cases were left out. If additional surgical cases are included, the situation may alter. This could alter the infection management guidelines and SSI surveillance system.

CONCLUSION:

In conclusion, Almost all of the amputees in our study were men. Amputations were more likely among those aged 35-65. Rehabilitating these patients is challenging due to comorbidities such as hypertension, coronary heart disease, and neurological diseases, among others. Amputation rates appear to be lower in the elderly. This observation cannot be projected with accuracy due to the fact that older age groups do not typically present to hospitals. Additionally, they are less prone to ulceration due to decreased ambulatory capacity. The longer a patient has diabetes, the higher the risk of amputation. The majority of infections in diabetic ulcers were polymicrobial, with *Pseudomonas aeruginosa* coming in close behind.

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