A Dissertation on

EVALUATION OF SURGICAL SITE INFECTION IN ABDOMINAL SURGERIES IN ADULTS

Dissertation submitted

In partial fulfilment of the regulations

For the award of the degree of

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Of

THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY

E.S.I.C. MEDICAL COLLEGE & PGIMSR,

K.K. NAGAR, CHENNAI.

APRIL 2020

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I solemnly declare that this dissertation entitled "**EVALUATION OF SURGICAL SITE INFECTION IN ABDOMINAL SURGERIES IN ADULTS"** is a bonafide and genuine research work carried out by me under the guidance of **Dr.P.N.SHANMUGA SUNDARAM,M.S.,** Department of General Surgery, ESIC-Medical College & PGIMSR, K.K.Nagar, Chennai-78.

This dissertation is being submitted to The TamilNadu Dr.M.G.R Medical University, Chennai, towards partial fulfilment of requirements of the degree of M.S.[General Surgery] examination to be held in April 2020.

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CONTENTS

LIST OF ABBREVIATIONS:

1. AGJ -- Anterior Gastro Jejunostomy
2. ASA -- American Society of Anaesthesiologists
3. BMI -- Body Mass Index
4. CDC -- Centre for Disease Control
5. HAI -- Hospital Associated Infection
6. JJ -- Jejunojejunostomy
7. RBS -- Random Blood Sugar
8. SSI -- Surgical Site Infection
9. WHO -- World Health Organisation

INTRODUCTION

Surgical site infections (SSIs) are infections of the incision or organ or space that occur after surgery [1]. The term 'surgical site infection' (SSI) was introduced in 1992 to replace the previous term 'surgical wound infection' [2]. Surgical site infection (SSI) has always been a major complication of surgery and trauma and has been documented for 4000–5000 years[3]. SSI is both the most frequently studied and the leading HAI reported hospital-wide in LMICs [4, 5]. World Health Organization (WHO) *Clean Care is Safer Care* programme shows that surgical site infection (SSI) affects up to one third of patients who have undergone a surgical procedure in LMICs and the pooled incidence of SSI was 11.8 per 100 surgical patients undergoing the procedure (range 1.2 to 23.6) [4, 5] .

Although SSI incidence is much lower in high-income countries, it remains the second most frequent type of HAI in Europe and the United States of America (USA). In some European countries, it even represents the most frequent type of HAI.

SSIs are among the most preventable HAIs [6, 7], but they still represent a significant burden in terms of patient morbidity and mortality and additional costs to health systems and service payers worldwide. Each SSI is associated with approximately 7-10 additional postoperative hospital days and patients with an SSI

have a 2-11 times higher risk of death, compared with operative patients without an SSI [8, 9.]

Surgical patients initially seen with more complex co morbidities and the emergence of antimicrobial-resistant pathogens increase the cost and challenge of treating SSIs[10, 11, 12.] For these reasons, the prevention of SSI has received considerable attention from surgeons and infection control professionals, health care authorities, the media and the public.

DEFINITION OF SSI:

Surgical site infection refers to an infection that occurs after surgery in the part of the body where the surgery took place. Surgical site infections can sometimes be superficial infections involving the skin only. Other surgical site infections are more serious and can involve tissues under the skin, organs, or implanted material.

(Source: United States Centers for Disease Control and Prevention. https://www.cdc.gov/HAI/ssi/ssi.html, accessed 11July 2016.).

Surgical site infection is also defined as an infection that occurs within 30 days after the operation and involves the skin and subcutaneous tissue of the incision (superficial incisional) and/or the deep soft tissue (for example, fascia, muscle) of the incision (deep incisional) and/or any part of the anatomy (for

example, organs and spaces) other than the incision that was opened or manipulated during an operation (organ/space).

(Source: European Centre for Disease Prevention and Control. http://ecdc.europa.eu/en/publications/Publications/120215_TED_SSI_protocol.pdf , accessed 16 August 2016).

CRITERIA FOR DEFINING SURGICAL SITE INFECTION[2]:

The CDC's NNIS system has developed standardized surveillance criteria for defining SSIs .By these criteria, SSIs are classified as being either incisional or organ/space. Incisional SSIs are further divided into those involving only skin and subcutaneous tissue (superficial incisional SSI) and those involving deeper soft tissues of the incision (deep incisional SSI). Organ/space SSIs involve any part of the anatomy (e.g., organ or space) other than incised body wall layers, that was Opened or manipulated during an operation.

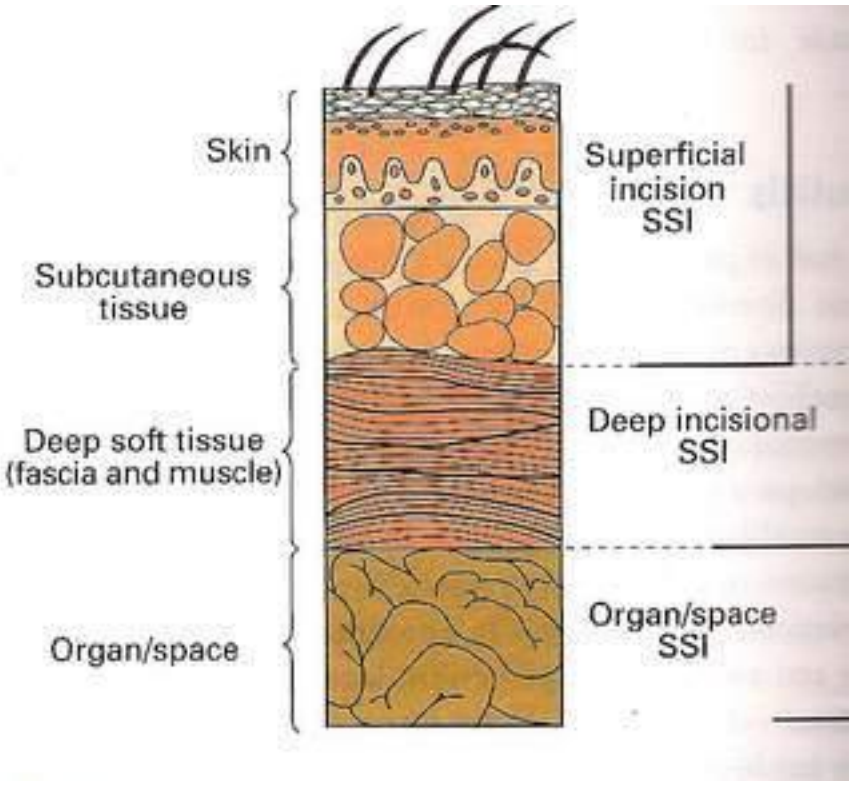


Fig1. Cross-section of abdominal wall depicting CDC classifications of surgical site infection[2].

Superficial Incisional SSI:

Infection occurs within 30 days after the operation *and* infection involves only skin or subcutaneous tissue of the incision *and* at least *one* of the following:

1. Purulent drainage, with or without laboratory confirmation, from the superficial incision.
2. Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.

3. At least one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat *and* superficial incision is deliberately opened by surgeon, *unless* incision is culture-negative.
4. Diagnosis of superficial incisional SSI by the surgeon or attending physician.

Do *not* report the following conditions as SSI:

1. Stitch abscess (minimal inflammation and discharge confined to the points of suture penetration).
2. Infection of an episiotomy or newborn circumcision site.
3. Infected burn wound.
4. Incisional SSI that extends into the fascial and muscle layers (see deep incisional SSI).

Note: Specific criteria are used for identifying infected episiotomy and circumcision sites and burn wounds.

Deep Incisional SSI:

Infection occurs within 30 days after the operation if no implant† is left in place or within 1 year if implant is in place and the infection appears to be related to the operation

and

infection involves deep soft tissues (e.g., fascial and muscle layers) of the incision

and at least *one* of the following:

1. Purulent drainage from the deep incision but not from the organ/space component of the surgical site.
2. A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least one of the following signs or symptoms: fever (>38ºC), localized pain, or tenderness, unless site is culture-negative.
3. An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination.
4. Diagnosis of a deep incisional SSI by a surgeon or attending physician.

Notes:

1. Report infection that involves both superficial and deep incision sites as deep incisional SSI.
2. Report an organ/space SSI that drains through the incision as a deep incisional SSI.

Organ/Space SSI:

Infection occurs within 30 days after the operation if no implant† is left in place or within 1 year if implant is in place and the infection appears to be related to the operation

and

Infection involves any part of the anatomy (e.g., organs or spaces), other than the incision, which was opened or manipulated during an operation

and at least *one* of the following:

1. Purulent drainage from a drain that is placed through a stab wound‡ into the organ/space.
2. Organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space.
3. An abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination
4. Diagnosis of an organ/space SSI by a surgeon or attending physician.

- ❖ National Nosocomial Infection Surveillance definition: a nonhuman-derived implantable foreign body (e.g., prosthetic heart valve, nonhuman vascular graft, mechanical heart, or hip prosthesis) that is permanently placed in a patient during surgery.
- ❖ If the area around a stab wound becomes infected, it is not an SSI. It is considered a skin or soft tissue infection, depending on its depth.

WOUND HEALING

Cutaneous wound healing is a process that involves both epithelial regeneration and the formation of connective tissue scar. Depending on the nature and size of the wound, the healing of skin wounds is said to occur by first or second intention.

Phases of wound Healing[3]:

1. Inflammatory phase
2. Proliferative phase
3. Remodeling phase (maturing phase).

Occasionally, a haemostatic phase is referred to as occurring before the inflammatory phase or a destructive phase following inflammation consisting of the cellular cleansing of the wound by macrophages.

Inflammatory phase:

The inflammatory phase begins immediately after wounding and lasts 2–3 days. Bleeding is followed by vasoconstriction and thrombus formation to limit blood loss. Platelets stick to the damaged endothelial lining of vessels, releasing adenosine diphosphate (ADP), which causes thrombocytic aggregates to fill the wound. When bleeding stops, the platelets then release several cytokines from their alpha granules.

These are platelet-derived growth factor (PDGF), platelet factor IV and transforming growth factor beta (TGFβ). These attract inflammatory cells such as polymorphonuclear leukocytes (PMN) and macrophages. Platelets and the local injured tissue release vasoactive amines, such as histamine, serotonin and prostaglandins, which increase vascular permeability, thereby aiding infiltration of these inflammatory cells

Proliferative phase:

The proliferative phase lasts from the third day to the third week, consisting mainly of fibroblast activity with the production of collagen and ground substance (glycosaminoglycans and proteoglycans), the growth of new blood vessels as capillary loops (angioneogenesis) and the re-epithelialisation of the wound surface. Fibroblasts require vitamin C to produce collagen. The wound tissue formed in the early part of this phase is called granulation tissue. In the latter part of this phase, there is an increase in the tensile strength of the wound due to increased collagen, which is at first deposited in a random fashion and consists of type III collagen. This proliferative phase with its increase of collagen deposition is associated with wound contraction, which can considerably reduce the surface area of a wound over the first 3 weeks of healing.

Remodeling phase:

The remodelling phase is characterised by maturation of collagen (type I replacing type III until a ratio of 4:1 is achieved). There is a realignment of collagen fibres along the lines of tension, decreased wound vascularity, and wound contraction due to fibroblast and myofibroblast activity. This maturation of collagen leads to increased tensile strength in the wound which is maximal at the 12th week post injury and represents approximately 80% of the uninjured skin strength.

Depending on the nature and size of the wound, the healing of skin wounds is said to occur by primary, secondary or tertiary intention.

Healing by First Intention[13]:

One of the simplest examples of wound repair is the healing of a clean, uninfected surgical incision approximated by surgical sutures. The incision causes only focal disruption of epithelial basement membrane continuity and death of relatively few epithelial and connective tissue cells. As a result, epithelial regeneration is the principal mechanism of repair. A small scar is formed, but there is minimal wound contraction. The narrow incisional space first fills with fibrin-clotted blood, which then is rapidly invaded by granulation tissue and covered by new epithelium.

- Within 24 hours, neutrophils are seen at the incision margin, migrating toward the fibrin clot. Basal cells at the cut edge of the epidermis begin to show increased mitotic activity. Within 24 to 48 hours, epithelial cells from both edges have begun to migrate and proliferate along the dermis, depositing basement membrane components as they progress. The cells meet in the midline beneath the surface scab, yielding a thin but continuous epithelial layer.
- By day 3, neutrophils have been largely replaced by macrophages and granulation tissue progressively invades the incision space. Collagen fibers are now evident at the incision margins, but these are vertically oriented and do not bridge the incision. Epithelial cell proliferation continues, yielding a thickened epidermal covering layer.
- By day 5, neovascularization reaches its peak as granulation tissue fills the incisional space. Collagen fibrils become more abundant and begin to bridge the incision. The epidermis recovers its normal thickness as differentiation of surface cells yields a mature epidermal architecture with surface keratinization.
- During the second week, there is continued collagen accumulation and fibroblast proliferation. The leukocyte infiltrate, edema, and increased vascularity are substantially diminished. The long process of "blanching" begins, accomplished by increasing collagen deposition within the incisional scar and the regression of vascular channels.

- By the end of the first month, the scar consists of a cellular connective tissue, largely devoid of inflammatory cells, covered by an essentially normal epidermis.

However, the dermal appendages destroyed in the line of the incision are permanently lost. The tensile strength of the wound increases with time.

Healing by Second Intention[13]:

When cell or tissue loss is more extensive, such as in large wounds, at sites of abscess formation, ulceration, and ischemic necrosis (infarction) in parenchymal organs, the repair process is more complex and involves a combination of regeneration and scarring. In second intention healing of skin wounds, also known as healing by secondary union the inflammatory reaction is more intense, and there is development of abundant granulation tissue, with accumulation of ECM and formation of a large scar, followed by wound contraction mediated by the action of myofibroblasts. Secondary healing differs from primary healing in several respects:

- A larger clot or scab rich in fibrin and fibronectin forms at the surface of the wound.
- Inflammation is more intense because large tissue defects have a greater volume of necrotic debris, exudates and fibrin that must be removed. Consequently, large defects have a greater potential for secondary, inflammation-mediated, injury.

- Larger defects require a greater volume of granulation tissue to fill in the gaps and provide the underlying framework for the regrowth of tissue epithelium. A greater volume of granulation tissue generally results in a greater mass of scar tissue

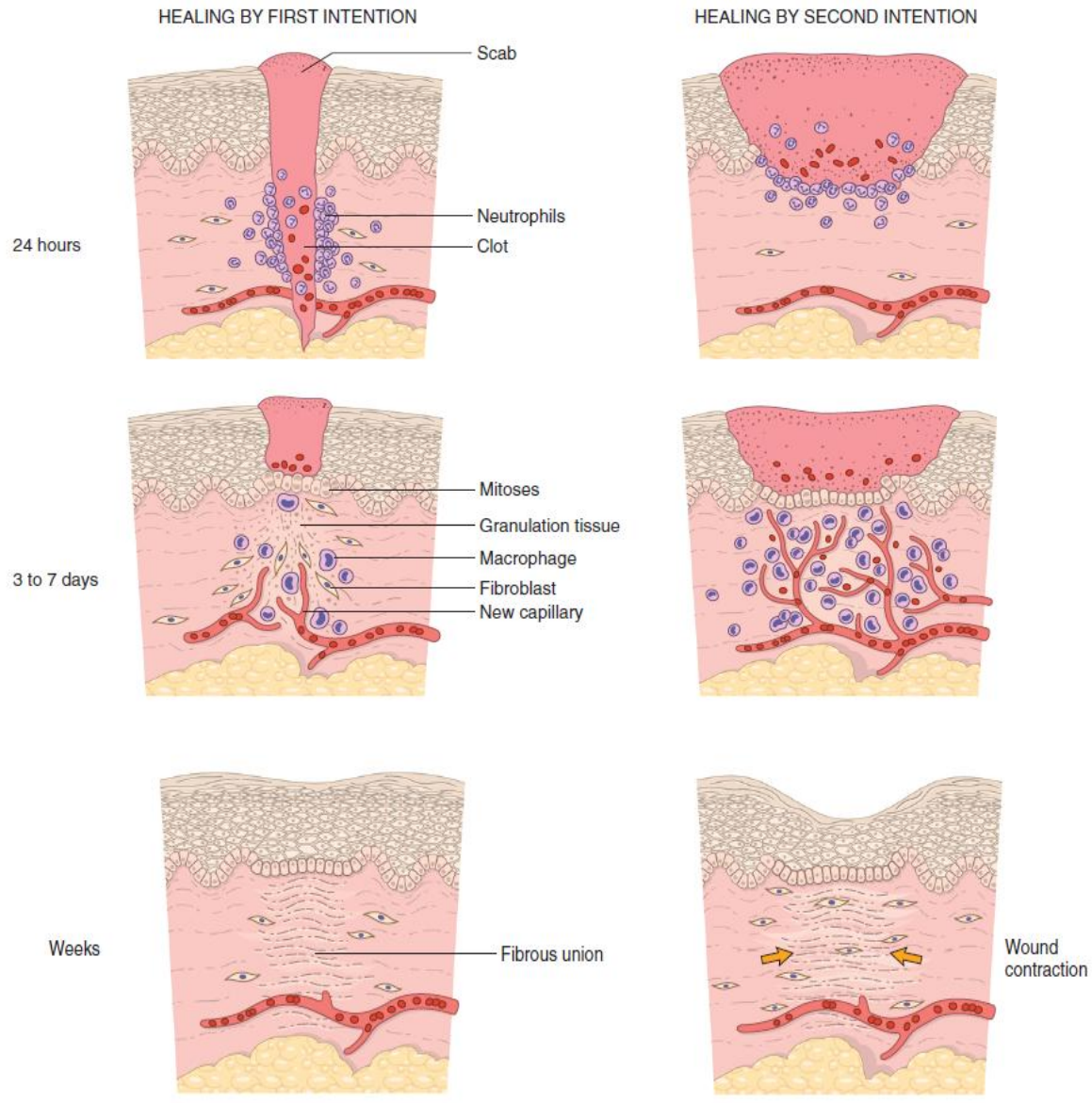


Fig 2: Steps in wound healing by first intention (*left*) and second intention (*right*).

- Secondary healing involves wound contraction. Within 6 weeks, for example, large skin defects may be reduced to 5% to 10% of their original size, largely by contraction. This process has been ascribed to the presence of myofibroblasts, which are modified fibroblasts exhibiting many of the ultrastructural and functional features of contractile smooth muscle cells.

Healing by Tertiary intention[3]:

Also called as Delayed primary intention. Here healing occurs when the wound edges are not opposed immediately, which may be necessary in contaminated or untidy wounds. The inflammatory and proliferative phases of healing are well established when delayed closure of the wound is carried out. This will result in a less satisfactory scar than would result after healing by primary intention.

Factors influencing healing of a wound:

- Site of the wound
- Structures involved
- Mechanism of wounding:

  Incision, Crush, Crush avulsion
- Contamination (foreign bodies/bacteria)
- Loss of tissue

- Other local factors

  Vascular insufficiency (arterial or venous), Previous radiation, Pressure

- Systemic factors:

Malnutrition or vitamin and mineral deficiencies, Disease (e.g. diabetes mellitus), Medications (e.g. steroids), Immune deficiencies (e.g. chemotherapy, acquired immunodeficiency syndrome [AIDS], Smoking.

Factors that determine whether a wound will become infected[3]:

- Host response
- Virulence and inoculum of infective agent
- Vascularity and health of tissue being invaded (including local ischaemia as well as systemic shock)
- Presence of dead or foreign tissue
- Presence of antibiotics during the 'decisive period'

$$\text{Risk of surgical site infection} = \frac{\text{Dose of bacterial contamination} * \text{virulence}}{\text{Resistance of the host patient}}$$

Quantitatively, it has been shown that if a surgical site is contaminated with $>10^5$ microorganisms per gram of tissue, the risk of SSI is markedly increased. However, the dose of contaminating microorganisms required to produce infection may be much lower when foreign material is present at the site

THE DECISIVE PERIOD:

There is up to a 4-hour interval before bacterial growth becomes established enough to cause an infection after a breach in the tissues, whether caused by trauma or surgery. This interval is called the ‘decisive period’ and strategies aimed at preventing infection from taking a hold become ineffective after this time period. It is therefore logical that prophylactic antibiotics should be given to cover this period and that they could be decisive in preventing an infection from developing, before bacterial growth takes a hold.

Microbiology[14]:

The microbiology of SSI depends on the nature of the procedure, location of the incision, and whether a body cavity or hollow viscous is entered during surgery. Most SSIs are caused by skin flora that are inoculated into the incision during surgery, therefore, the most common SSI pathogens are all gram-positivecocci—*Staphylococcus epidermidis, S. aureus,* and *Enterococcus* spp. For infrainguinal incisions and intracavitary surgery, gramnegative bacilli such as *Escherichia coli* and *Klebsiella* spp. are potential pathogens. When surgery is performed on the pharynx, lower gastrointestinal tract, or female genital tract, anaerobic bacteria become potential SSI pathogens.

Outbreaks or clusters of SSIs have also been caused by unusual pathogens, such as *Rhizopus oryzae, Clostridium perfringens, Rhodococcus bronchialis,*

Nocardia farcinica,Legionella pneumophila and *Legionella dumoffii,* and *Pseudomonas multivorans.* These rare outbreaks have been traced to contaminated adhesive dressings, elastic bandages, colonized surgical personnel, tap water, or contaminated disinfectant solutions.

Type of Procedure	Likely pathogens
Cardiac Neurosurgery Breast	*S. aureus;* coagulase-negative staphylococci
Ophthalmic	*S. aureus;* coagulase-negative staphylococci, streptococci, gram-negative bacilli
Orthopaedic	*S. aureus;* coagulase-negative staphylococci gram-negative bacilli
Biliarytract, appendecectomy, colorectal	gram-negative bacilli, anaerobes
Gastroduodenal	gram-negative bacilli, oropharyngeal naerobes, streptococci
Vascular	*S.aureus;*coagulase-negative staphylococci
Urologic	Gram-negative bacilli

RISK FACTORS FOR SURGICAL SITE INFECTION[15]:

Patient Factors:

- Ascites (for abdominal surgery)
- Chronic inflammation
- Corticosteroid therapy (controversial)
- Obesity

- Diabetes
- Extremes of age
- Hypoxemia
- Peripheral vascular disease (for lower extremity surgery)
- Postoperative anemia
- Prior site irradiation
- Recent operation
- Remote infection
- Skin or nasal carriage of staphylococci
- Skin disease in the area of infection (e.g., psoriasis)
- Undernutrition

Environmental Factors:

- Contaminated medications
- Inadequate disinfection/sterilization
- Inadequate skin antisepsis
- Inadequate ventilation

Treatment Factors:

- Drains
- Emergency procedure
- Hypothermia

- Inadequate antibiotic prophylaxis
- Oxygenation (controversial)
- Prolonged preoperative hospitalization
- Prolonged operative time

1. Ascites :

Ascites increases intra-abdominal pressure and increase the risk of wound dehiscence and thus delays wound healing which is predisposed to pathogens[16].

2. Chronic inflammation:

Preoperative inflammatory activity is related to a higher risk of SSI[17, 18]. It is well known that local inflammation impairs the healing process and systemic inflammation impairs the immune response[19]. Also Hypoalbuminemia occurs due to the accelerated catabolism induced by systemic inflammation which in turn contributes to impaired healing.

3. Corticosteroid therapy:

Immunosuppressive agents are drugs that inhibit or prevent activation of the immune system. They are commonly prescribed to prevent rejection of transplanted organs or for the treatment of inflammatory diseases, such as rheumatoid arthritis or inflammatory bowel disease. Some observational studies indicate that the immunosuppressive effect of the drugs could lead to impaired wound healing and increased risk of SSI in patients treated with these agents[20, 21].

Conversely, WHO has not recommended the discontinuation of immunosuppressive treatment because it could induce flares of disease activity and long term interruptions of therapy might induce the formation of anti-drug antibodies and subsequently decrease the effect of the immunosuppressive. Thus discontinuation of immunosuppressive agents remains controversial.

4. Obesity:

Incidence of surgical site infection increases with an increase of BMI. The mechanism by which obesity increases the risk of SSI is likely to be multi factorial [22]. Obese surgical patients have been shown to have reduced subcutaneous tissue oxygenation and to require a greater fraction of inspired oxygen to achieve the same arterial oxygen tension as normal-weight patients, thus predisposing them to SSI[23]. Wound hypoxia impairs healing by a number of potential mechanisms; healing wounds have high metabolic demands, and insufficient oxygen will slow the healing process. Immune cells also have high oxygen demands, requiring oxygen for the formation of microbicidal reactive oxygen species[24].

In addition to poor tissue oxygenation, adequate tissue levels of prophylactic antibiotics may be harder to achieve in obese patients[25]. Antimicrobials show different pharmacokinetics when administered to obese patients, with both hydrophilic and hydrophobic compounds generally having a higher volume of

distribution, requiring a higher dose to reach the same plasma drug concentrations as for non-obese patients[25]. Hepatic clearance may also be increased in obese patients[26]. Also increase in operation time for the obese and a longer operation time has been described as a significant predictor of postoperative wound infections [27, 28]. Furthermore impaired immunity, elevated blood glucose levels and too much tension on the surgical incision are also contributory factors to impaired wound healing[29, 30]

5. Diabetes Mellitus:

Blood glucose levels rise during and after surgery due to surgical stress. Surgery causes a stress response that result in a release of catabolic hormones and the inhibition of insulin. Moreover, surgical stress influences pancreatic beta-cell function, which results in lower plasma insulin levels. Taken together, this relative hypoinsulinaemia, insulin resistance and excessive catabolism from the action of counter-regulatory hormones make surgical patients at high risk for hyperglycaemia, even non-diabetic individuals[31]

There is no significant relationship between increasing levels of HbA1c and SSI rates[32]. Also, increased glucose levels (>200 mg/dL) in the immediate Postoperative period (<48 hours) were associated with increased SSI risk[33, 34]. Hyperglycemia related impairment in immune response, sensory peripheral

neuropathy, autonomic neuropathy and vascular insufficiency are the reasons diabetic patients have an increased risk.

6. Age:

Increasing age is associated with an increased risk of development of SSI. Increased prevalence of co morbid conditions, an increased severity of acute illness and a decreased host response to bacterial invasion— in older patients are the reasons older patients appear to have an increased risk of SSI [35, 36, 37]

7. Hypoxia:

Tissue hypoxia appears to predispose to SSI[38]. But it is controversial whether perioperative oxygen administration is beneficial for the prevention of infection[39.] The ischemic milieu of the fresh surgical incision is vulnerable to bacterial invasion. Moreover, oxygen has been postulated to have a direct antibacterial effect.[40, 41.]wound healing process involves numerous functions, many of which depend on the presence of oxygen. Collagen production and development influence the strength of the wound is directly correlated with the partial pressure of oxygen (PO2) of the tissue. Synthesis of collagen, cross-linking and the resulting wound strength depend on the normal function of specific enzymes. The functions of these enzymes are directly related to the amount of oxygen present, e.g. hydroxylation of proline and lysine by hydroxylase enzymes[42]. Although clinical trials have had conflicting results, one recent meta analysis has suggested a

benefit of supplemental oxygen administration specifically to reduce the incidence of SSIs[43]. WHO recommends that adult patients who are having anesthesia with endotracheal intubation should receive an 80% fraction of inspired oxygen (FiO2) both intraoperatively and in the immediate postoperative phase for 2–6 hours to reduce the risk of SSI. The 80% FIO2 is associated with a decrease in SSI compared to an FIO2 of 30%–35%[31]

7. Anaemia:

The World Health Organisation defines anaemia as an insufficient circulating red cell mass, with a haemoglobin concentration of < 13.0 g/dL for men and < 12.0 g/dL for women ; even mild anaemia adversely effects surgical outcome and is independently associated with increased postoperative mortality, complications, and length of hospital stay[44, 45] .

Anaemia causes Suppression of immunity and decreased oxygenation in the wound causing increased susceptibility to infection & impaired healing

8. Prior site irradiation:

Prior irradiation at the surgical site increases the risk of SSI, likely due to tissue damage and wound ischemia[46].

9. Coexistent infections at a remote body site:

A pre-existing infection may be the source for hematogenous spread, causing late infections to implant or be a contiguous site for bacterial transfer [47-49.]

These infections at a site remote from the wound have been linked to increasing SSI rates three- to five fold[50]. It was observed in a study that among 383 patients who had cultures taken from SSIs and remote sites, 55% of the wound infections were preceded by urinary tract or lower respiratory tract infections with the same microorganisms found in the surgical site and causing the SSI [50].

10. Colonization with microorganisms:

S aureus colonization, found in the nares of 20% to 30% of healthy humans, has been strongly implicated as a predictor of SSI involving this organism[51, 52.] A multivariate analysis demonstrated that such carriage is the most powerful independent risk factor for SSI.

11. Malnutrition:

Nutritional status can have a profound impact on the immune system as documented by some studies [53-55]. These alterations in host immunity may make patients more susceptible to postoperative infections and malnutrition was reported as a threat to surgical outcome, such as delayed recovery, higher rates of morbidity and mortality, prolonged hospital stay, increased health care costs and a higher early readmission rate [53-58].

Given the role of nutrition in the host response to surgery, many researchers believe that nutritional interventions would reduce SSI and the related morbidity. However, an epidemiological association between SSI and malnutrition has been

difficult to demonstrate consistently for all surgical subspecialties. There is very little consensus on the optimal timing and dosage of multiple nutrient-enhanced nutrition, especially for the prevention of SSI.

12. Smoking:

Nicotine, nitric oxide and carbon monoxide use delays primary wound healing and may increase the risk of SSI[2, 59, 60]. Smoking causes endothelial dysfunction, inflammation, and progression of atherothrombotic disease. Moreover, smokers have evidence of an impaired systemic immune response with suppressed immunoglobulin levels, an altered CD4 to CD8 cell ratio, and reduced phagocyte activity[59, 60].

13. Altered immune response[61]:

The altered host defenses can play a significant role in the development of infection in surgical patients. Many factors associated with the patient have been clearly identified as responsible for a decreased immune response: old age, concomitant diseases (diabetes, renal and liver failure, solid and hematologic neoplasias, malnutrition, autoimmune diseases, AIDS) and concomitant therapies (corticosteroid, cytotoxic agents). Old age can affect both humoral and cell-mediated immune responses. Chronic diseases can be responsible for a reduced primary response or depression of delayed hypersensitivity reactions (renal failure, neoplasias) or changes in leukocyte function (diabetes, leukemia, lymphomas).

Malnutrition frequently accompanies diseases such as cancer, chronic and acute pancreatitis, and inflammatory bowel diseases. Deficiencies of vitamins and minerals (B6, A, folate, biotin, riboflavin…) can alter significantly the leukocyte function and immune response. Finally, there appears to be innate immune-suppression following any form of injury which is correlated with its magnitude and can affect any aspect of immunity. Surgical stress can include some reduction of cell mediated immunity.

14. Low Albumin[62, 63]:

Serum albumin is an indicator of the patient's nutritional status. Malnutrition is a well-documented risk factor for SSI. Malnourished patients are at risk of impaired systemic and intestinal immune function, as well as decreased digestive and absorptive capacity due to the altered architecture of the gut barrier. A deficiency of protein can impair capillary formation, fibroblast proliferation, proteoglycan synthesis, collagen synthesis, and wound remodeling. A deficiency of protein also affects the immune system, with resultant decreased leukocyte phagocytosis and increased susceptibility to infection.

15. Duration of surgical scrub:

Surgical hand preparation is probably the most important SSI prevention strategy, although there is no strict randomized study comparing surgery with and without previous hand antisepsis preparation. Bacterial growth is slowed after

preoperative scrubbing with an antiseptic agent[64.] The surgical hand scrub helps to eliminate transient microorganisms, reduce resident microorganisms, and maintain the resident organisms at reduced levels until the end of the surgical procedure. The scrub is usually performed with an alcohol-based hand rub with persistent activity or an antimicrobial soap/product[65, 66]. Hands and forearms are scrubbed with antimicrobial soap for the length of time recommended by the manufacturer, usually 2–5 minutes. When the quality of water is not assured in the Operating Room, surgical hand antisepsis using Alcohol based hand rub can be used. A sufficient amount of ABHR is applied to *dry* hands and forearms for the length of time recommended by the manufacturer, typically 1.5 minutes, and hands and forearms allowed to dry before donning sterile gloves[31.]

16. Skin antisepsis

Preoperative bathing is considered a good clinical process to clean and reduce the bacterial load on the skin (skin decolonization). Preoperative bathing is generally recommended for patients, usually with an antimicrobial soap such as chlorhexidine gluconate (CHG 4% combined with a detergent) if affordable and available. Other options are a triclosan preparation and—if no other options are available—regular soap[31.] Studies have concluded that preoperative antiseptic bathing reduces the risk of SSI[67.]

17. Operative shaving:

Pre operative Shaving has been associated with increased risk of SSIs[1, 14, 68]. Hair removal with razor can cause microscopic trauma to the skin that later serve as foci for bacterial multiplication[31, 69.] Razors are preferred for preoperative hair removal on only two body sites, the scalp and male genitalia, as clippers have been shown to cause more skin damage in these areas. On all other body sites, if it is necessary to remove hair prior to a surgical procedure, personnel should consider clipping the hair[1, 14, 68, and 69.]

18. Preoperative skin prep:

It reduces the microbial load on the patient's skin as much as possible before incision of the skin barrier. Alcohol based solutions are generally recommended. If alcohol cannot be included in the preparation, chlorhexidine is preferred over iodine unless contraindications exist, chlorhexidine gluconate causes greater reductions in skin microflora than povidone-iodine also had greater residual activity after a single application[70.] Further, chlorhexidine gluconate is not inactivated by blood or serum proteins[71, 72] Iodophors may be inactivated by blood or serum proteins, but exert a bacteriostatic effect as long as they are present on the skin[71].

19. Operating room ventilation:

Operating room air may contain microbial-laden dust, lint, skin squames, or respiratory droplets. The microbial level in operating room air is directly

proportional to the number of people moving about in the room[73.] The ventilation system in the operating room is designed to provide certain functions, primarily to create thermal comfort for the patient and staff and to maintain constant air quality by eliminating aerosols and particles within the room Outbreaks of SSIs caused by group A beta-hemolytic streptococci have been traced to airborne transmission of the organism from colonized operating room personnel to patients[74, 75] .The strain causing the outbreak was recovered from the air in the operating room. Ideally, around 20 air changes per hour are necessary to dilute microorganisms generated in the operating room and to exclude ingress from surrounding areas [76].

20. Inadequate sterilization of instruments:

Infection risk is certainly increased when non-sterile instruments are used for surgery. This can occur due to inadequate supervision, lack of training and/or short staffing facilitated poor handling practices during and after retrieval of surgical sets from the autoclave[77, 78]

21. Length of preoperative stay:

It increases the risk of exposure to nosocomial pathogens thus increasing risk of SSI[79]. Length of preoperative stay is also likely a surrogate for severity of illness and co-morbid conditions requiring inpatient work-up and/or therapy before the operation[14].

22. Duration of operation:

Prolonged duration of operation results in increased exposure of operation site to air, increased desiccation of tissue, decreased antibiotic level in tissues[80], stress of prolonged anaesthesia and sometimes blood loss[81].

23. Antimicrobial prophylaxis:

The objective of surgical antibiotic prophylaxis is to achieve a sufficient tissue level of the antibiotic before tissues are manipulated. Antibiotic levels should be maintained through the entire procedure. The antibiotic is selected based on the procedure being performed and the most likely pathogens that will be encountered during the surgery. The amount of antibiotic administered should be determined according to the patient's weight[68, 82]. It is optimal to administer the drug intravenously 60 minutes before skin incision[68] and it has been documented that administration more than 60 minutes preoperatively is associated with higher risk of surgical infection[83], with the exception of a few specific drugs (vancomycin & fluroquinolones).

24. Surgical drains:

The use of drains has contributed significantly as a risk factor in causing SSI. Epithelialization of the wound is prevented and the drain becomes a conduit, holding open a portal for invasion by pathogens colonizing the skin. Bacterial colonization of initially sterile drain tracts increases with the duration of time the

drain is left in place[84]. Moreover drains are more likely to be used in contaminated or dirty wounds and in emergency and prolonged operations which increases the probability of the wound getting infected. Several studies of drains placed into clean or clean-contaminated incisions also have shown that the rate of SSI rate is increased[15].

25. Surgical technique[14]:

Excellent surgical technique is widely believed to reduce the risk of SSI[71, 85]. Such techniques include maintaining effective hemostasis while preserving adequate blood supply, preventing hypothermia, gently handling tissues, avoiding inadvertent entries into a hollow viscus, removing devitalized (e.g., necrotic or charred) tissues, using drains and suture material appropriately, eradicating dead space, and appropriately managing the postoperative incision.

26. Hypothermia[15]:

Hypothermia is defined as a core temperature below 35°C and has been associated with an increased risk of SSI. It is common for patients to become hypothermic during and after major surgical procedures that last more than two hours. Hypothermia may occur as the result of exposure, large-volume infusion of un warmed fluids or blood products, or evaporative losses during intracavitary surgery, especially if the chest and abdomen are opened. Peripheral and cutaneous vasoconstriction occurs to preserve core heat, but vasoconstriction decreases

microcirculatory blood flow leading to reduced levels of oxygen in the tissues, which impairs the ability of neutrophils to kill organisms and therefore decreases the wound's ability to heal. Mild intraoperative hypothermia is associated with an increased incidence of SSIs following elective colon surgery and diverse Operations[86.]

27. Emergency procedures:

Surgical site infection occurs with greater frequency in emergency than elective surgery because of factors such as inadequate preoperative preparation, higher frequency of contaminated or dirty wounds in emergency surgeries[87, 88]. Lack of proper control of other medical comorbidities (such as uncontrolled diabetes) & lack of timely antibiotic prophylaxis could also be a contributing factor.

28. Blood transfusion[89]:

Transfusion-related immunomodulation has been considered to be one of the major mechanisms of these blood transfusion–induced SSI developments. Both proinflammatory and immunosuppressive effects were reported to be simultaneously induced by ABT, and they were mediated by allogeneic mononuclear cells

28. Type of wound [90]:

Surgical management of the wound also is a critical determinant of the propensity to develop a SSI. In healthy individuals, class I and II wounds may be

closed primarily, while skin closure of class III and IV wounds is associated with high rates of incisional SSIs (~25% to 50%)

Surgical Wound Classification[14]:

Class I/Clean: An uninfected operative wound in which no inflammation is encountered and the respiratory, alimentary, genital, or uninfected urinary tract is not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow nonpenetrating (blunt) trauma should be included in this category if they meet the criteria.

Class II/Clean-Contaminated: An operative wound in which the respiratory, alimentary, genital, or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered.

Class III/Contaminated: Open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, nonpurulent inflammation is encountered are included in this category.

Class IV/Dirty-Infected: Old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This

definition suggests that the organisms causing postoperative infection were present in the operative field before the operation

CLINICAL FEATURES OF SSI[15]

Surgical site infection remains a clinical diagnosis. Presenting signs and symptoms depend on the depth of infection, typically as early as postoperative day 4 or 5, although rare necrotizing SSIs caused by *Streptococcus pyogenes* or *Clostridium perfringens* may develop within 24 hours after surgery. Clinical signs range from local induration only to the hallmarks of infection (e.g.,erythema, edema, tenderness, warmth, pain-related immobility),which may manifest before wound drainage. In cases of deep incisional SSIs, tenderness may extend beyond the margin of erythema, and crepitus, cutaneous vesicles, or bullae may be present. With ongoing infection, signs of systemic inflammatory response syndrome (SIRS; two or more of fever, leukocytosis, tachycardia, or tachypnea) herald the development of sepsis. In intracavitary (organ, space) SSIs, there will be Purulent drainage from a drain that is placed through a stab wound into the organ/space or symptoms specific to the involved organ system will usually predominate, such as ileus, respiratory distress or failure, or altered sensorium. These deep infections may sometime remain occult or present with few symptoms, mimicking incisional SSIs and leading to inadequate initial treatment; they become apparent only when a major complication ensues.

Management of SSI[15]:

Cultures are not mandatory for the management of superficial incisional SSIs, particularly if drainage and wound care alone will suffice without antibiotics and if superficial swab cultures are collected, which are susceptible to contamination by nearby skin colonists. In cases of deeper infection or hospital acquired infection, exudates or drainage specimens should be sent for analysis from the surgically opened wound—as opposed to the already opened wound, which becomes colonized. Blood culture is collected if evidence of systemic involvement present. Ultrasonography can be applied to the infected wound area to assess whether there is a collection for which drainage is required.

The first steps in the treatment of SSIs are to open and examine the suspicious portion of the incision and decide about further surgical treatment. If the infection is confined to the skin and superficial underlying subcutaneous tissue, opening the incision and providing local wound care may be all the treatment that is necessary. Antibiotic therapy of superficial incisional SSIs is indicated only for erythema extending beyond the wound margin or for systemic signs of infection. Deeper SSIs may require formal surgical exploration and débridement to obtain local control of the infection. Surgical site infection must also be considered as a cause of delayed or failed wound healing and prompt the same decisions as described earlier.

Organ or space SSIs occur within a body cavity (e.g., intraabdominal, intrapleural, intracranial) and are directly related to a surgical procedure. The diagnosis of organ or space SSIs usually requires some form of imaging to confirm the site and extent of infection. Adequate source control requires a drainage procedure, whether open or percutaneous. Give the patient an antibiotic that covers the likely causative organisms. Consider local resistance patterns and the results of microbiological tests in choosing an antibiotic.

AIMS & OBJECTIVES

1. To evaluate the incidence of Surgical Site Infection (SSI) among the patients undergoing abdominal surgeries in the dept. of General Surgery
2. To assess the risk factors of Surgical Site Infection.
3. To find out the types of surgical site infection.

REVIEW OF LITERATURE

Various studies have been conducted regarding surgical site infection in India since 1972. These studies revealed that surgical site infection rates in India were found to be between 4 to 30% (Agarwal[91], 1972; Rao and Harsha[92], 1975; Kowli[93] et al., 1985; Anvikar[94] et al., 1999). Agarwal et al , Rao et al & Anvikar et al reported the ineffectiveness of penicillin against staphylococcus aureu

Kowli et al found an infection rate of 17.4% when preoperative stay Was 0-7 days, and an infection rate of 71.4% with a preoperative stay of more than 21 days. In Anvikar et al study the SSI rate was 6.1%. His study demonstrated that preoperative hospital stay predisposed an individual to 1.76% risk of acquiring an infection. With an increase in preoperative stay, the risk increased proportionally. A preoperative stay of one week increased the risk rate to 5% .SSI was higher in emergency than elective surgery & increased duration of surgery increased the risk of SSI. All these studies also indicated gradual increase in the emergence of antibiotic resistant microorganisms in surgical patients Preoperative antibiotic decreased SSI

Hemant et al[95] conducted a prospective clinical trial in 100 patients who underwent abdominal surgeries. SSI rate was 14%. The SSI rate was the highest in dirty surgeries (40%). Male patients were affected more (18.2%) than the female patients (5.9%). The SSI rate increased with increasing age and it also increased

significantly with the increasing duration of pre-operative hospitalization. The SSI rate was higher in emergency surgeries as compared to the elective. With increase in the time of surgery, the risk of infection increased. The most commonly isolated organism from SSIs was *Pseudomonas* (42.85%), followed by *Klebsiella* sp. (28.5%) and other bacteria. Among the organisms that were isolated, the most of them were multidrug resistant.

Amit agarwal et al[96] conducted a prospective study on 375 patients who underwent abdominal surgeries. But they excluded organ space SSI and duration of surgery >2.5 hours from the study. SSI incidence was 15.7 % (59/375). SSI rate was higher in emergency surgeries(28.6%) than elective surgeries (5.7%). In elective surgeries group maximum SSI was found in colonic surgery – 14.3%, while minimum in cholecystectomy 2.2%. In Emergency surgery group maximum incidence of SSI was observed in hepato biliary surgeries 44.4% while minimum with appendicular pathology 19.4%. It was found that SSI increased with increasing age linearly. Other significant factors involved were increasing class of wound (dirty > clean wound class), increased preoperative stay, presence of remote site infection, increased duration of surgery and use of drains. E. coli was found to be the most common organism.

Mekla et al[97] conducted a cohort study on 100 patients who underwent abdominal surgeries. But they excluded those underwent laparoscopic surgery,

received antibiotics for duration of >1 week before surgery, reoperative surgery from the study. The incidence rate of superficial SSI was 39% with 95% CI (29.4%–49.2%). They found 12 variables significantly associated with superficial SSI: middle or elderly age, male gender, diabetes mellitus, preoperative anemia, preoperative hypoalbuminemia, tobacco smoking (RR 1.88, CI 1.18–2.9), higher ASA score(RR 4.05, CI 2.65–6.33), perioperative blood transfusion, drain placement, surgery duration >2 h(RR 3.24, CI 1.98–5.31), contaminated/dirty wound class(RR 2.57, CI 1.52–4.31) and emergency surgery(RR 1.8, CI 1.1–3.0).

Adeyinka Ayodele Adejumo et al[98] conducted a prospective study on 223 patients who underwent laporotomy. Incisional SSI was clinically diagnosed in 85 patients giving an incidence rate of 38.1%. Sixty-three (74.1%) were superficial SSI while 22 (25.9%) were deep SSI. The risk factors for SSI were anaemia, contaminated and dirty wounds, retroviral disease status, physiological status (ASA scores IV and V), prolonged surgery time, cadre of surgeon, emergency surgeries and use of drains. The high incidence of SSI observed in this study was found more in patients that presented with septic abdomen and those that had large bowel procedure. Staphlyococcuss aureus & klebseilla were the common organism isolated.

Emil aga et al[99] conducted a prospective cohort study which included 302 patients who underwent abdominal surgeries in the Western Galilee Medical

Center in Nahariya, Israel. The SSI incidence rate was 22.2%. The univariate analysis defined 13 variables significantly associated with SSI: age > 60 years, lower functional status, diabetes mellitus, congestive heart failure, immunocompromising underlying disease, treatment with chemotherapy and other immunosuppressive medications, impaired immune system open cholecystectomy, laparotomy, an American Society of Anesthesiologists (ASA) score > 2, drain insertion, and 'dirty wound' classification. In multivariate regression analysis, treatment with immunosuppressive medications (OR = 2.5, 95% confidence interval (CI) = 1.099–143.443), open cholecystectomy (OR = 2.25, 95% CI = 2.242–40.109), and dirty wound classification (OR = 2.179, 95% CI = 3.80–20.551) were significantly associated with SSI

Lul raka et al[100] conducted a prospective study in which a total of 253 surgical interventions in 225 patients were evaluated. The overall incidence rate of SSI was 12%.Superficial incisional SSI was most common (55%). Clinical infections were culture positive in 40.7% of cases. Duration of operation, duration of preoperative stay, wound class, ASA score >2, use of antibiotic prophylaxis and NNIS class of >2 were all found to be risk factors associated s ($p < .001$).

The International Nosocomial Infection Control Consortium (INICC) conducted a cohort prospective surveillance study on surgical site infections in 10 hospitals in 6 Indian cities from January 2005 to December 2011[101]. They

documented 1189 surgical site infections, associated with 28 340 surgical procedures (4.2%; 95% CI 4.0–4.4).11 types of surgical procedures were included for study of which the incidence of SSI was 6.0% for exploratory abdominal surgery .

Ashish pathak et al[102] conducted a study in a teaching hospital in ujjain in 720 patients admitted for surgery. SSI rate was 5%. Risk factors for SSI identified were as follows: severity of disease (P = .001), presence of drains (P =.020), history of previous hospitalization (P = .003), preoperative stay (P = .005), wound classification (P < .001), and surgical duration (P < .001). Independent risk factors identified included wound classification (odds ratio = 4.525; P < .001) and surgical duration (odds ratio = 2.554; P = .015). Most patients (99%) were prescribed antibiotics.Metronidazole (24.5%), ciprofloxacin (11%), and amikacin (9%) were the most commonly prescribed antibiotics. Most commonly isolated bacteria were Staphylococcus aureus (n = 14), of which 34% were methicillin-resistant Staphylococcus aureus, and Pseudomonas aeruginosa (n = 6), which showed resistance to ceftazidime (70%), ciprofloxacin (63%), and gentamicin (57%).

Anand saxena et al[103] conducted a prospective study in a teaching hospital in Bhopal on 300 patients admitted for various surgeries. Out of 300 patients observed, 43 patients developed surgical site infections (14.33%). Out of 43 infected cases, 37 cases were culture positive (86.04%, 37/43), while 6 cases were

culture negative (13.96%, 6/43). Surgical site infection was found to be higher in males and patients above 50 years of age & in emergency surgery than elective surgery. SSI was increased with increased length of preoperative stay duration. Obesity, Diabetes and Anemia were additional risk factors in surgical site infection. *Staphylococcus aureus (37.83%) was* most commonly identified organism in culture.

Suchitra et al[104] conducted a prospective study on 1125 surgeries for the incidence of surgical site infections. The results indicated that 12% ofpatients undergoing surgery developed SSI. *Staphylococcus aureus* (33%) and *Enterococcus* spp. (33%) were the commonest etiologic agents. Patients with SSIs had a significantly extended ICU and ward stay (p<0.001), and incurred higher hospital costs (p<0.001) when compared to those who did not develop SSIs. The risk factors associated with SSIs were age above 45 years (p=0.012), female (p=0.070), diabetic status (p<0.001)

Rajanikanth et al[105] conducted a prospective study on 248 patients who underwent various surgeries in the General Surgery department. Abdominal surgeries contributed 47% of total surgeries in their study. Among 248 patients, 45 developed surgical site infection(18.14%). SSIs were most commonly found among males, aged, diabetics, anaemic, underweight and overweight, hypertensive, blood transfusion and patients with longer hospital stay. Surgical Site Infections

were higher in emergency cases than elective surgeries. *Staphylococcus aureus* was the most common organism isolated from surgical site infections. Multidrug resistance organisms were predominant in surgical site infections.

Pinakin et al[106] conducted a prospective longitudinal study at a tertiary care centre of Ahmadabad city. Total 480 patients operated for general surgical procedures were included. The SSI rate was 9.4%.The risk factors associated with SSI were age (18.3% versus 7.1%), diabetes (25.5% versus 7.6%), type of anaesthesia (general = 13.6% versus regional=7.1%), type of surgery (emergency = 21.7% versus elective = 7.3%), duration of surgery (17.9% versus 7.2%), type of wound (dirty = 28.4% versus clean = 2.99%), pre-operative hospital stay (27.3% versus 3.3%) and presence of drain (15.2% versus 7.2%).

Satyanarayana et al[107] conducted a retrospective observational study which included patients who had undergone surgeries (abdominal) in the Department of General Surgery and Department of Obstetrics and Gynacology.1000 cases were included in the study. The overall surgical wound infection rate was 13.7%.The infection rate was more with emergency surgery (25.2%) when compared to elective surgery (7.6%). The surgical site infection rate increased as the risk index score increased from 0 to 3. SSI was more with early operative and post operative Prophylaxis. They found a definite correlation between the wound infection rate and the timing of antimicrobial prophylaxis.

Lilani et al[108] conducted a prospective study on 190 patients admitted for surgery clean and clean-contaminated elective cases were included in the study. Normal microbial flora was studied within 24 to 48 hours of admission in the ward.Infected wounds were studied bacteriologically and clinically. The overall infection rate was 8.95%.Surgical site infection rate was 3.03% in clean surgeries and 22.41% in clean-contaminated surgeries. Significant increase was seen in surgical site infection rate with an increase in preoperative stay and the increase in duration of surgery. Surgical site infection rate was much higher (22.41%) in cases where a drain was used than in non-drained wounds (3.03%). The most common isolate was *Staphylococcus aureus* followed by *Pseudomonas aeruginosa*.

METHODOLOGY

Type of study: Prospective study

Place of study: ESIC MEDICAL COLLEGE & PGIMSR, K.KNAGAR, Chennai

Period of study: 18 months from April 2018 to September 2019

Study population:

100 adult patients undergoing abdominal surgeries (elective and emergency) whomever satisfy the inclusion criteria.

INCLUSION CRITERIA:

Consenting patients undergoing elective & emergency abdominal surgeries

EXCLUSION CRITERIA:

1. Patients with HIV, HBV or HCV infection.
2. Patients on chemotherapy & radiotherapy
3. Patients on oral steroids & other immunosuppressant drugs.
4. Patients with features of hepatic, cardiac & renal failure.
5. ASA (American Society of Anaesthesiologists) score IV or V

Study procedure:

Patients who satisfy the inclusion criteria were included in the study. Informed written consent was obtained. Appropriate history was taken; clinical examination & relevant investigations were carried out. Patients were admitted. Intravenous antibiotic was given 30 –60 minutes before the commencement of

procedure. 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. Signs of SSI were looked for. If the patient developed SSI in this period, then Type of SSI was classified and swab culture was taken to identify the micro organism & antibiotic sensitivity pattern. CDC (Centre for disease Prevention & Control) criterion was used for diagnosis & classification of SSI. Patient was treated accordingly. Then the patients were discharged. All the details were recorded in the proforma. The patients were followed up every week till 30 days of post operative period for SSI in the outpatient dept. If the patient developed any features of SSI during follow up period after discharge, then Patient was treated accordingly as described above. All details were recorded in the Proforma.

Ethical consideration:

The ethical standards for human experimentation were followed during the study and permission from the institutional ethical committee was taken.

Data analysis:

Data analysis was done both manually and by using computer. Calculated data were arranged in systemic manner, presented in various table and figures and statistical analysis was made to evaluate the objectives of this study with the help of Statistical Package for Social Science (SPSS) version 22.0.

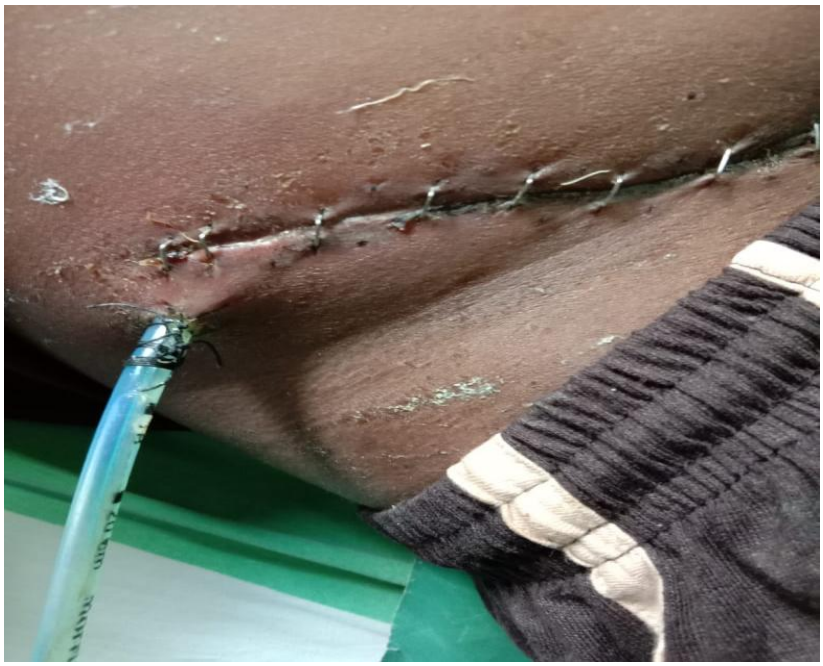


Fig 3. Discharge form suture site suggesting superficial SSI

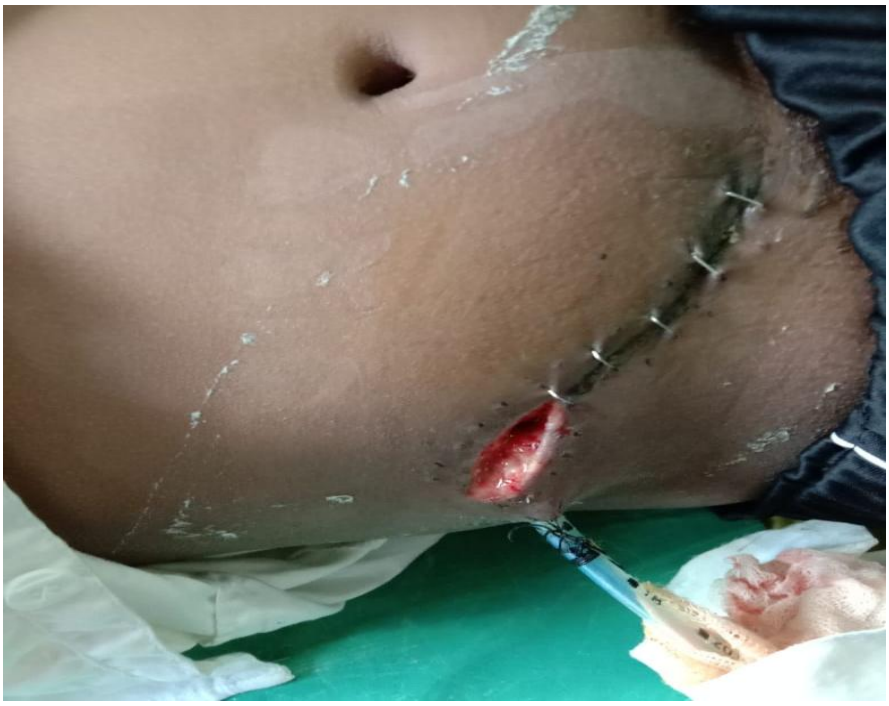


Fig 4. Wound Gaping

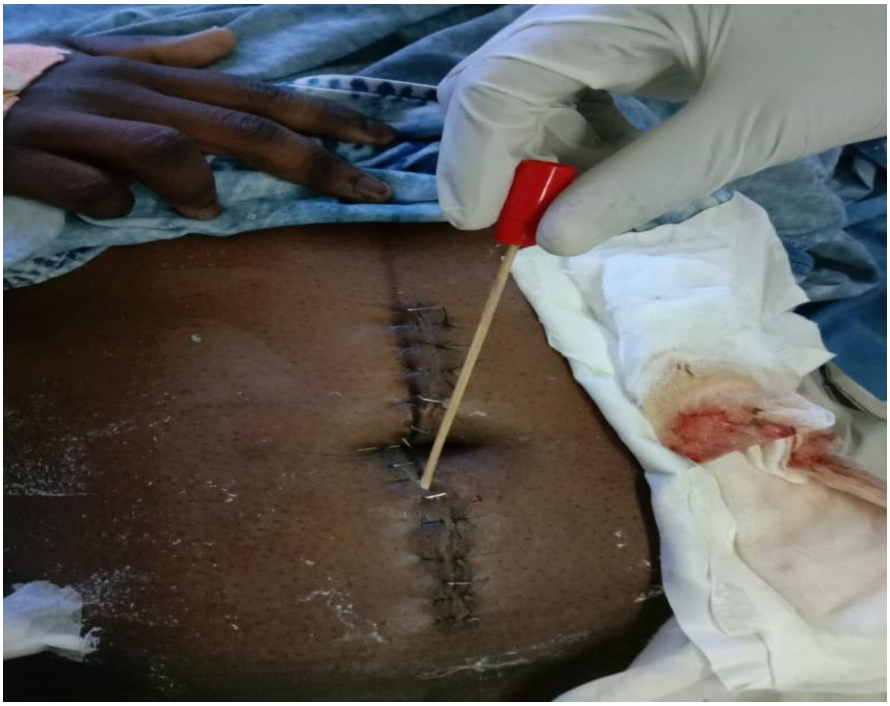


Fig 5. Swab used to collect Pus for culture & sensitivity pattern

REULTS

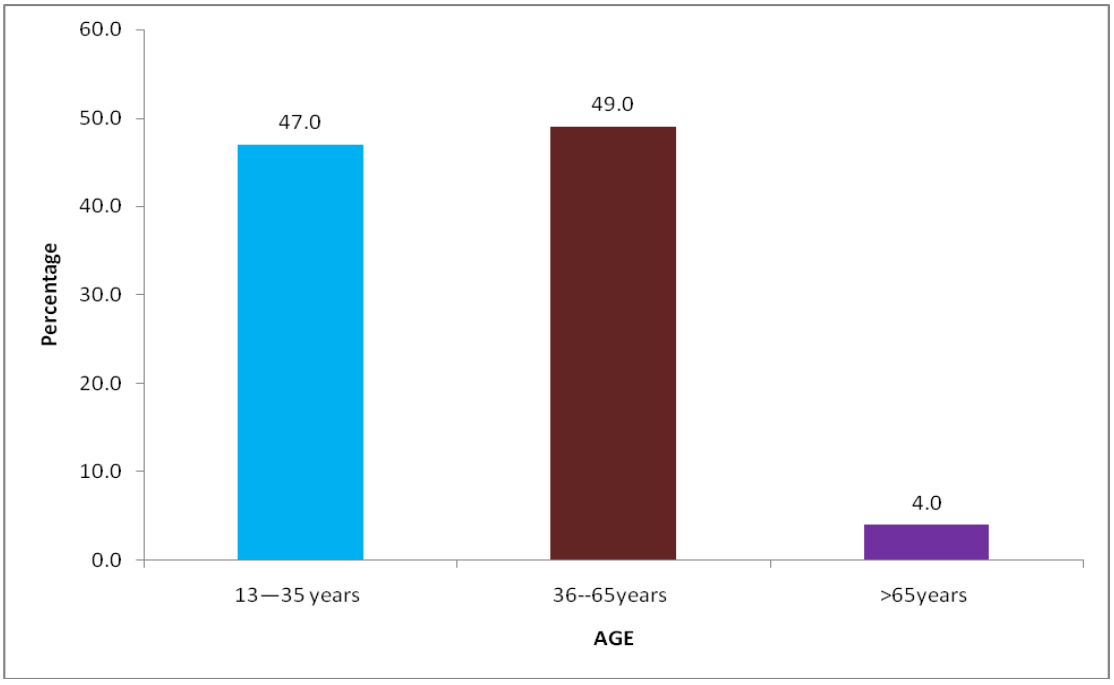
TABLE NO. 1

AGE

S. No.	Age	No. of Patients	Percentage
1.	13—35 years	47	47.0
2.	36--65years	49	49.0
3.	>65years	4	4.0
	Total	**100**	**100.0**

CHART NO. 1

AGE



In our study maximum numbers of patients were 35 to 65 years of age.

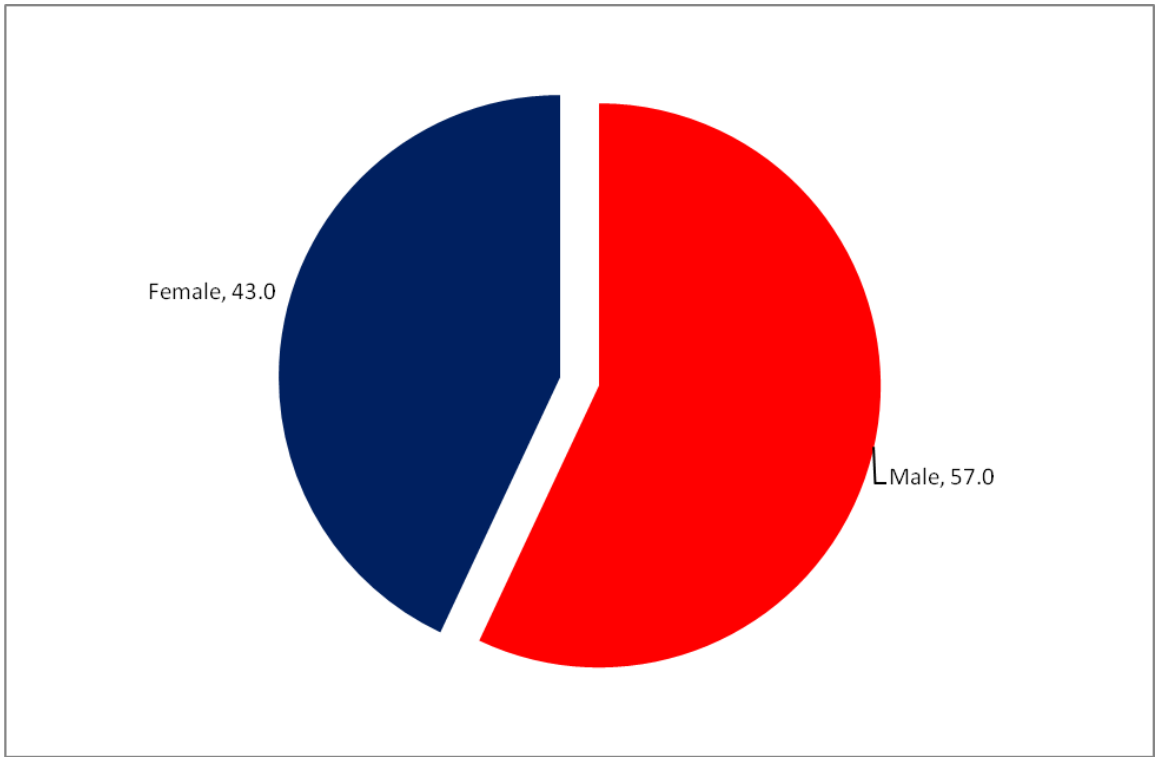
TABLE NO. 2

GENDER

S. No.	Gender	No. of Patients	Percentage
1.	Male	57	57.0
2.	Female	43	43.0
	Total	**100**	**100.0**

CHART NO. 2

GENDER



In our study majority of patients were male.

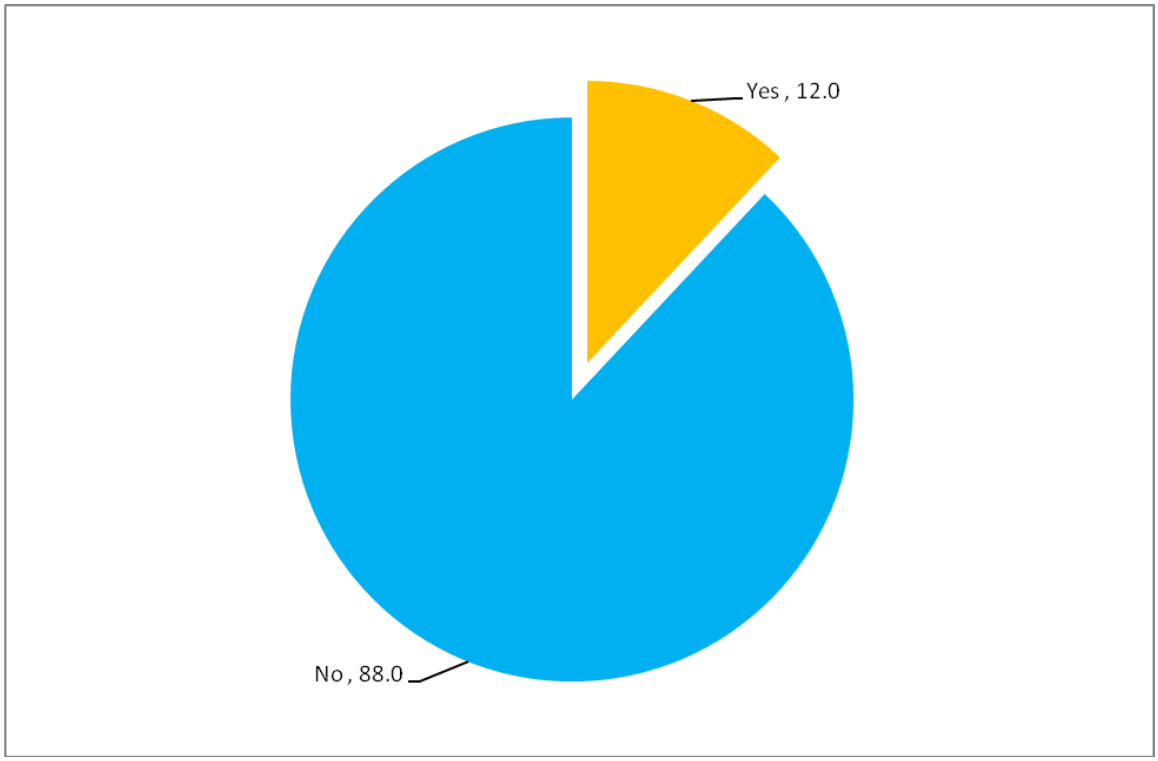
TABLE NO. 3

DIABETES MELLITUS

S. No.	Opinion	No. of Patients	Percentage
1.	Yes	12	12.0
2.	No	88	88.0
	Total	**100**	**100.0**

CHART NO. 3

DIABETES MELLITUS



In our study 12 patients were known diabetic on therapy. No new patients were diagnosed in our study

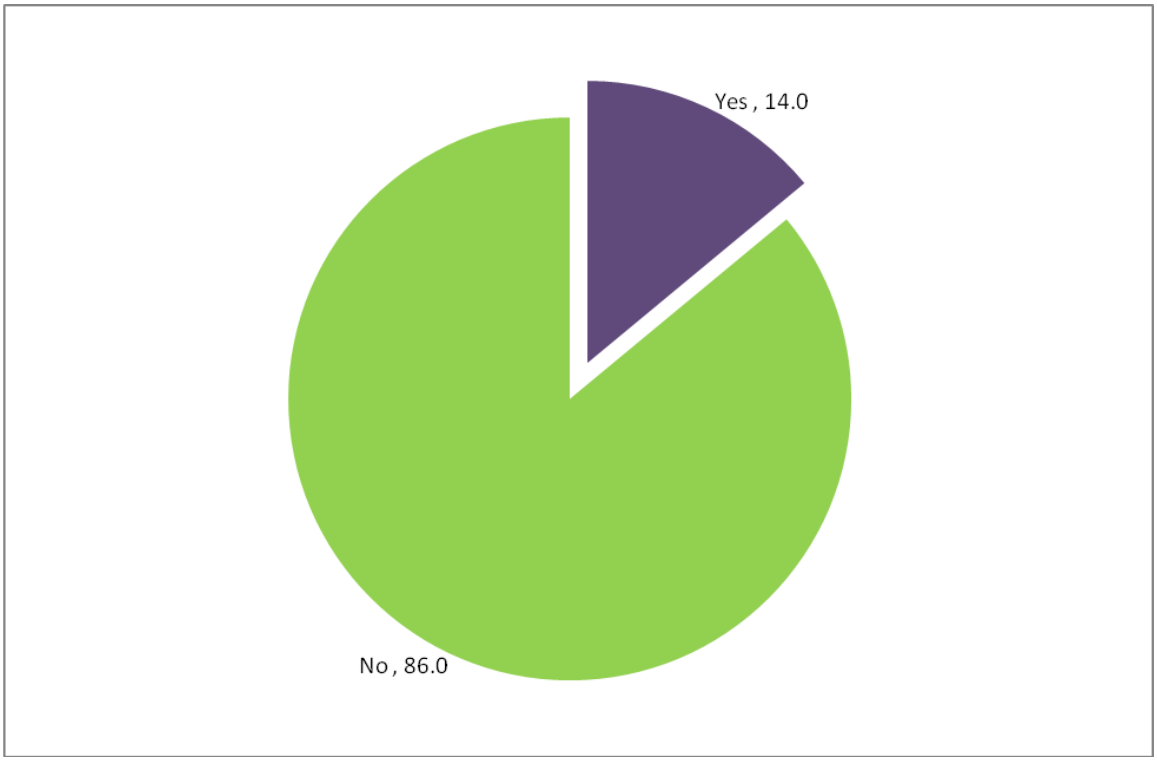
TABLE NO. 4

SMOKING

S. No.	Opinion	No. of Patients	Percentage
1.	Yes	14	14.0
2.	No	86	86.0
	Total	**100**	**100.0**

CHART NO. 4

SMOKING



In our study out of 100 patients 14 patients were smokers**.**

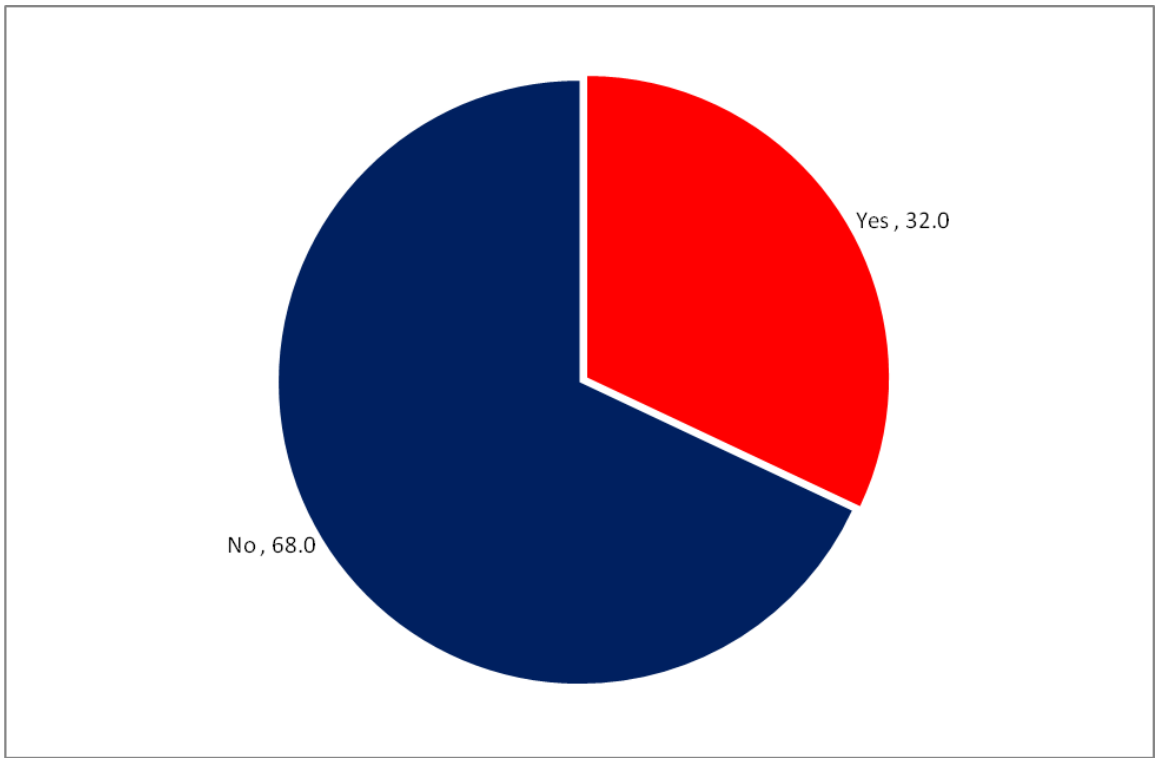
TABLE NO. 5

PALLOR

S. No.	Opinion	No. of Patients	Percentage
1.	Yes	32	32.0
2.	No	68	68.0
	Total	**100**	**100.0**

CHART NO. 5

PALLOR



On clinical examination 32 patients were found to be pale.

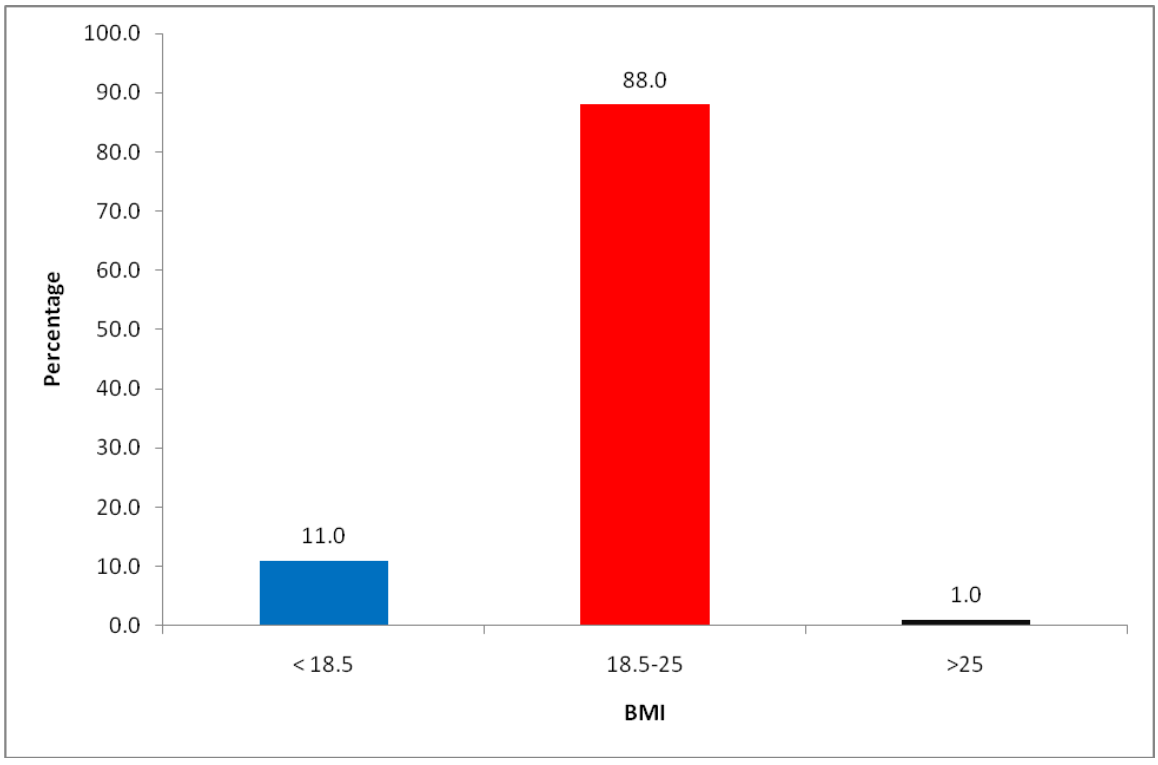
TABLE NO. 6

BMI

S. No.	BMI	No. of Patients	Percentage
1.	< 18.5	11	11.0
2.	18.5-25	88	88.0
3.	>25	1	1.0
	Total	**100**	**100.0**

CHART NO. 6

BMI



In our study majority of patients had normal body mass index. Only one patient was obese. 11 patients were under nourished.

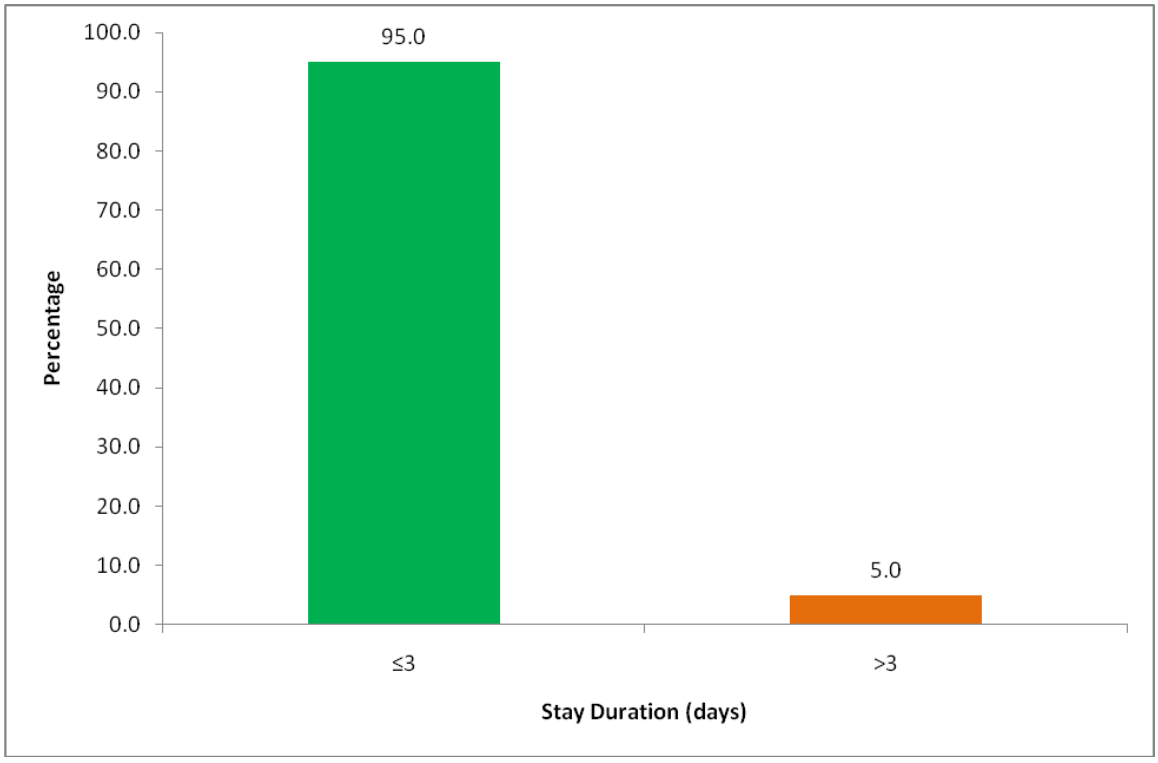
TABLE NO. 7

STAY DURATION (DAYS) (PRE OP)

S. No.	Days	No. of Patients	Percentage
1.	≤3	95	95.0
2.	>3	5	5.0
	Total	**100**	**100.0**

CHART NO. 7

STAY DURATION (DAYS) (PRE OP)



In our study 95 patients had pre operative stay less than 3 days. This can be due to more emergency surgeries than elective surgeries.

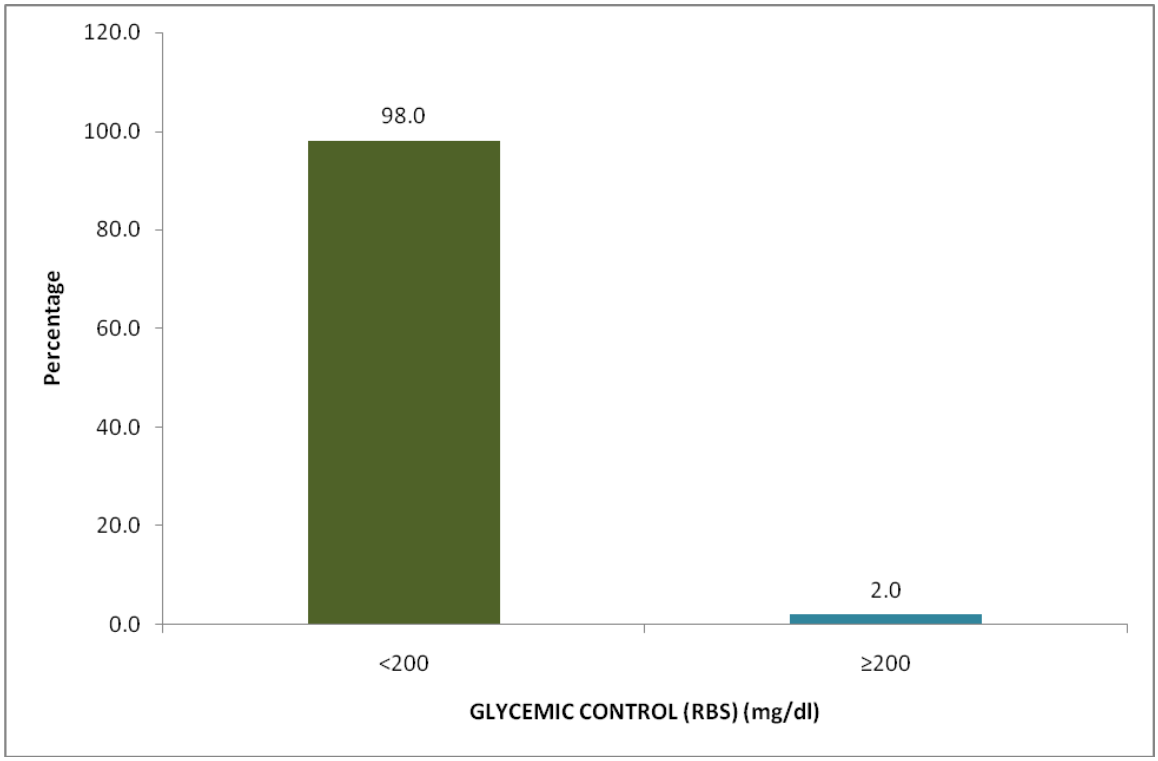
TABLE NO. 8

GLYCEMIC CONTROL (RBS) (mg/dl) (PRE OP)

S. No.	Days	No. of Patients	Percentage
1.	<200	98	97.0
2.	≥200	2	3.0
	Total	**100**	**100.0**

CHART NO. 8

GLYCEMIC CONTROL (RBS) (mg/dl)



In our study 2 patients had elevated blood sugar level >200mg/dl. All these patients were known diabetic. These patients underwent emergency procedures.

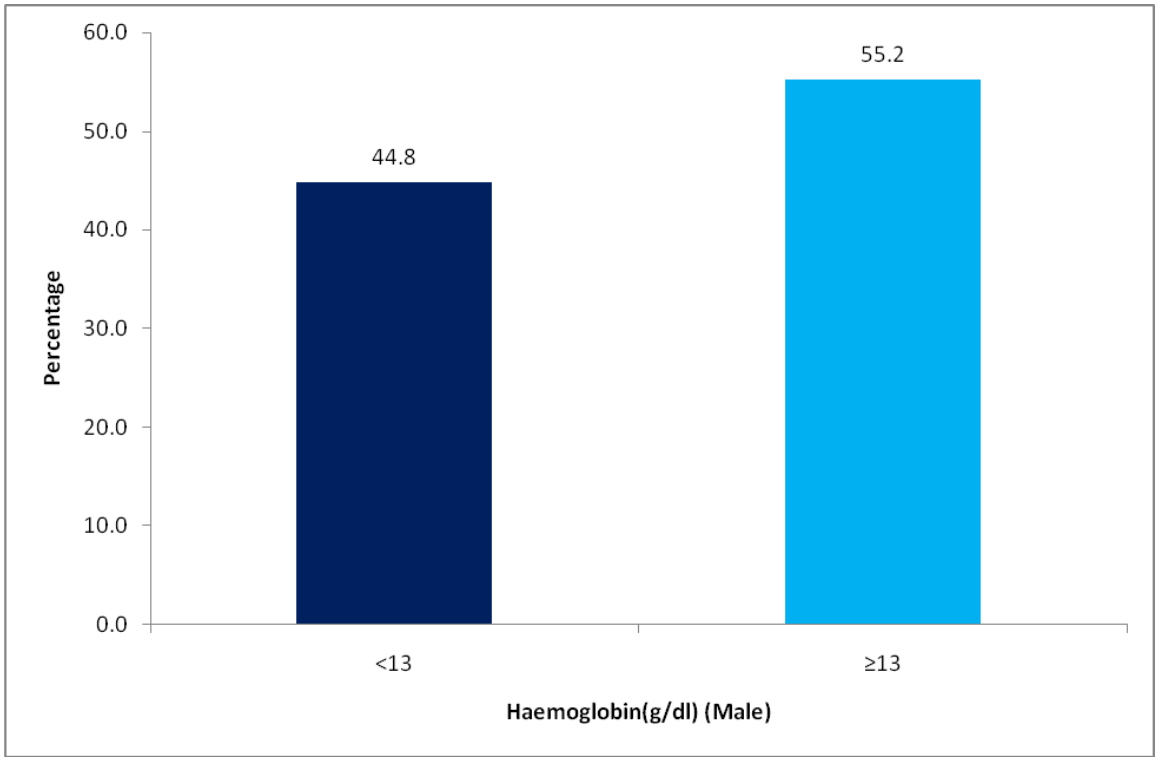
TABLE NO. 9

HAEMOGLOBIN (g/dl) (Male)

S. No.	Count	No. of Patients	Percentage
1.	<13	26	44.8
2.	≥13	32	55.2
	Total	**58**	**100.0**

CHART NO. 9

HAEMOGLOBIN (g/dl) (Male)



Out of 58 male patients 26 were found to have anaemia. None of the patients required blood transfusion. Majority of patients were of the age group 13 to 35 years. All the male patients above 65 years of age were found to have low hemoglobin.

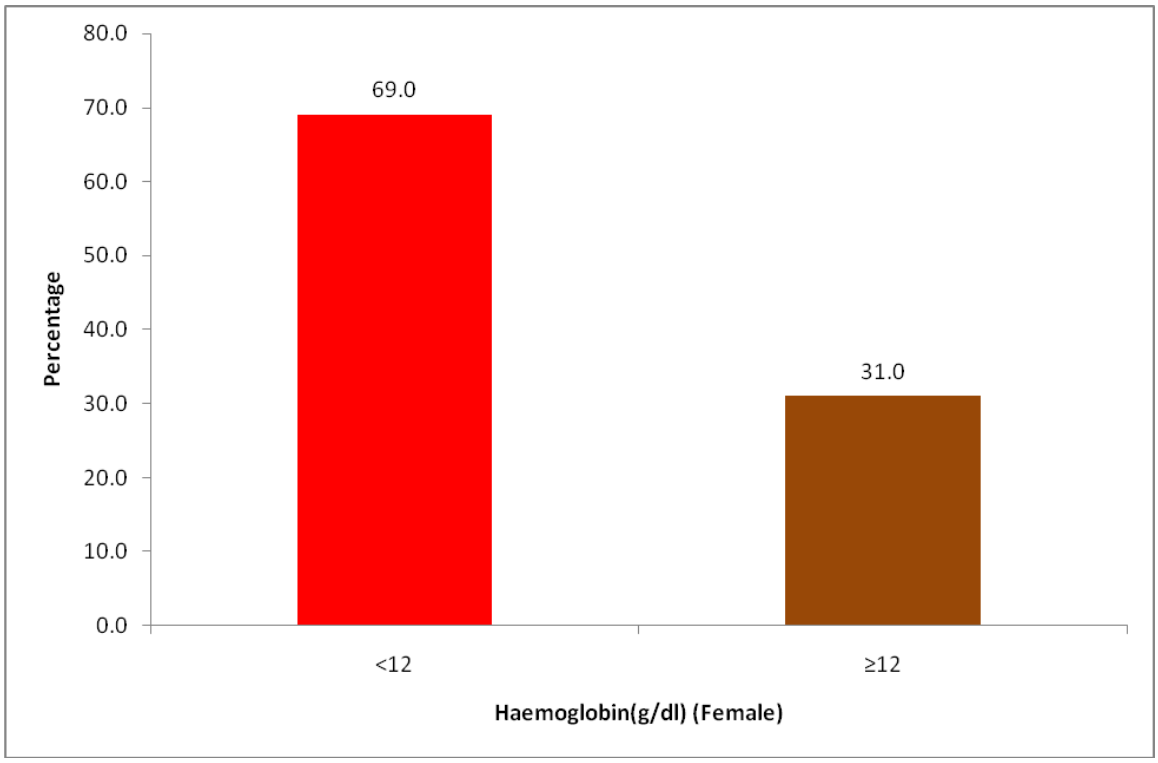
TABLE NO. 10

HAEMOGLOBIN (g/dl) (Female)

S. No.	Count	No. of Patients	Percentage
1.	<12	29	69.0
2.	≥12	13	31.0
	Total	**42**	**100.0**

CHART NO. 10

HAEMOGLOBIN (g/dl) (Female)



Out of 42 female patients 29 were found to have anaemia. None of the patients required blood transfusion. Majority of patients were of the age group 35 – 65 years.

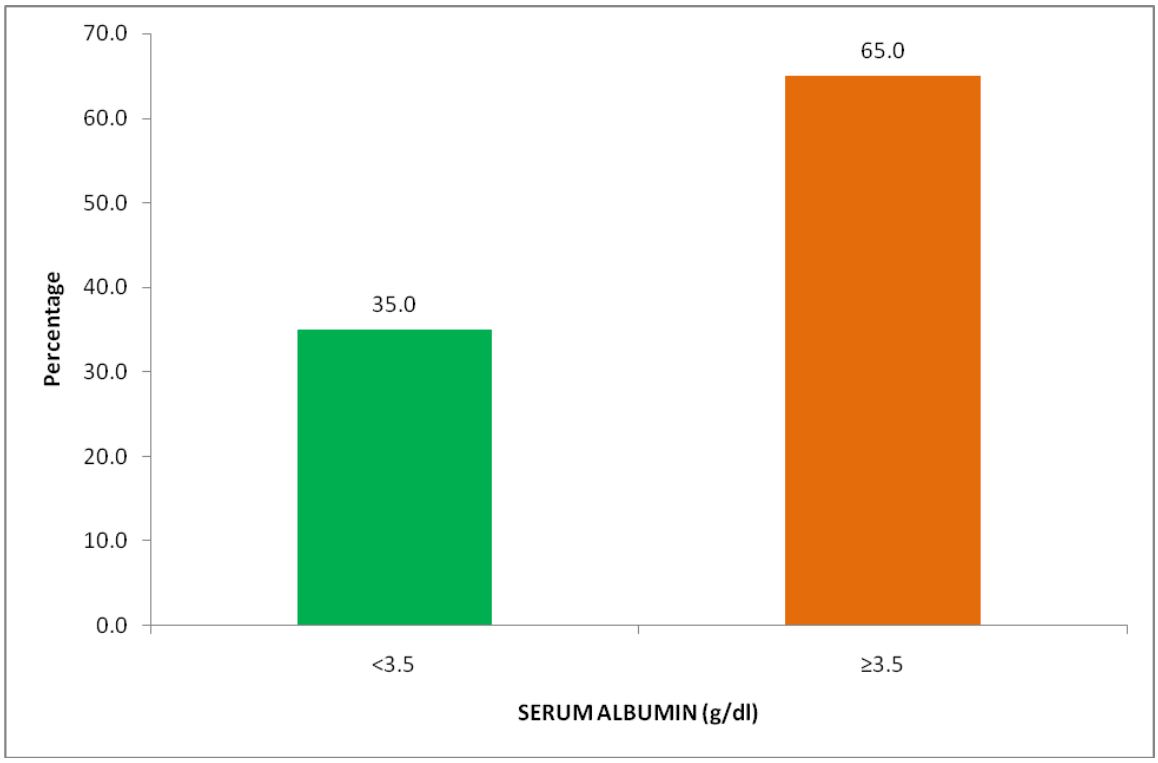
TABLE NO. 11

SERUM ALBUMIN (g/dl)

S. No.	Count	No. of Patients	Percentage
1.	<3.5	35	35.0
2.	≥3.5	65	65.0
	Total	**100**	**100.0**

CHART NO. 11

SERUM ALBUMIN (g/dl)



Out of 100 patients 35 patients were found to have low serum albumin. 31 patients also had low hemoglobin along with decreased albumin level.

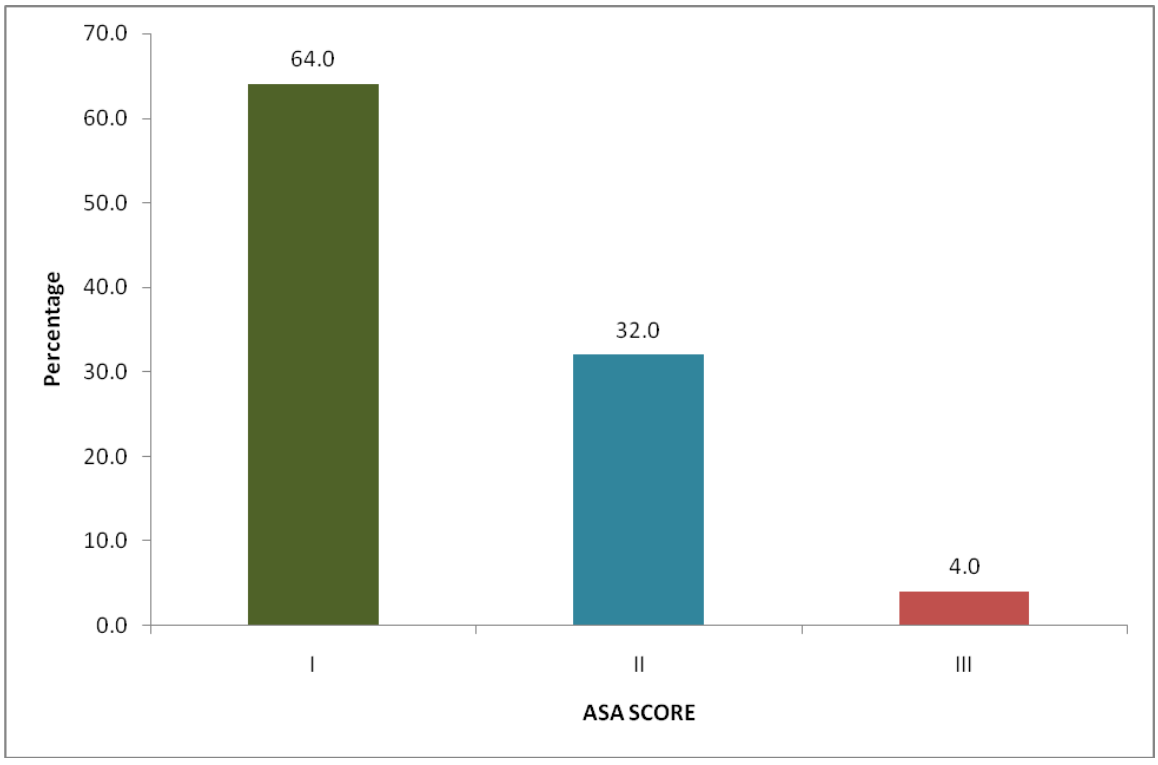
TABLE NO. 12

ASA SCORE

S. No.	Score	No. of Patients	Percentage
1.	I	64	64.0
2.	II	32	32.0
3.	III	4	4.0
	Total	**100**	**100.0**

CHART NO. 12

ASA SCORE



In our study 64 patients came under ASA score I.

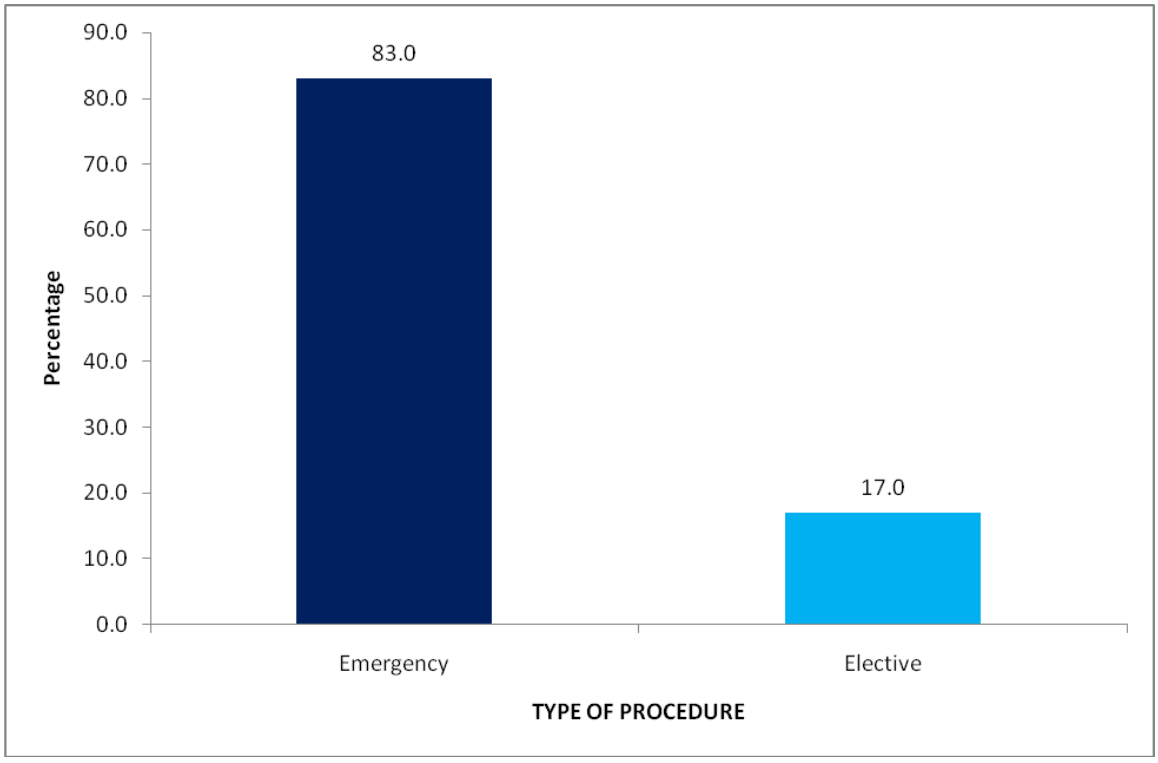
TABLE NO. 13

TYPE OF PROCEDURE

S. No.	Count	No. of Patients	Percentage
1.	Emergency	83	83.0
2.	Elective	17	17.0
	Total	**100**	**100.0**

CHART NO. 13

TYPE OF PROCEDURE



Out of 100 abdominal surgeries 83 were of emergency type.

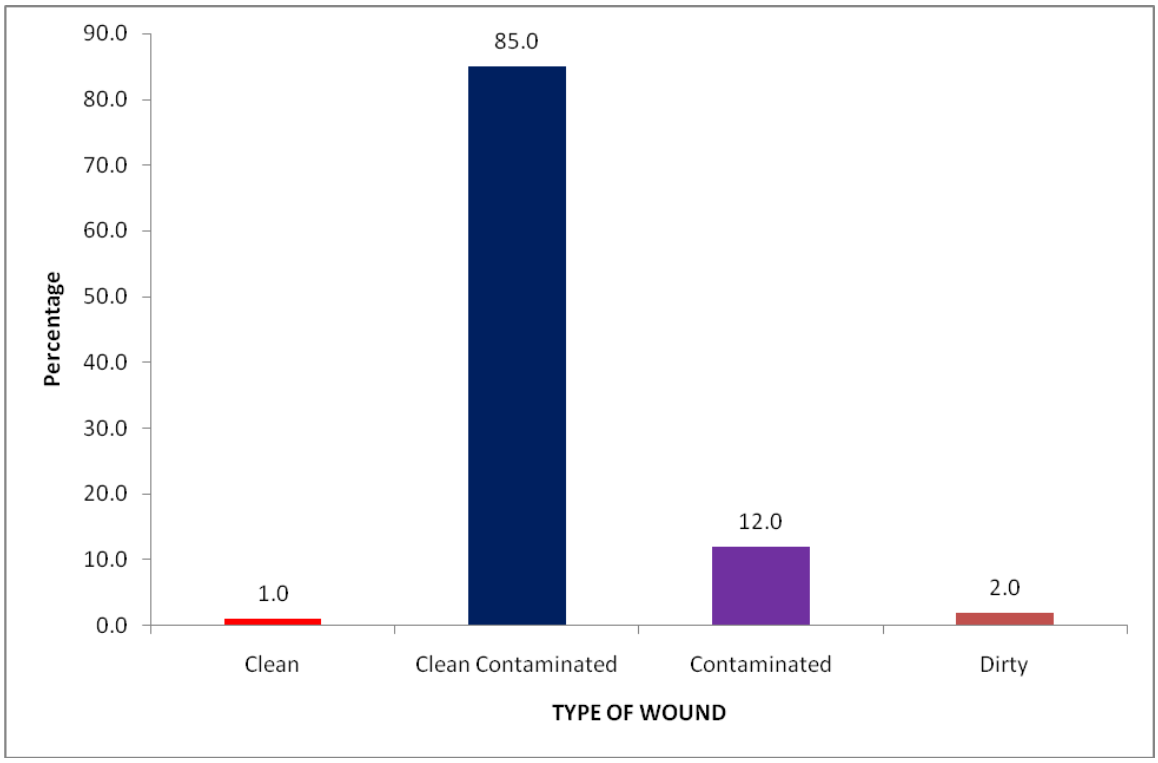
TABLE NO. 14

TYPE OF WOUND

S. No.	Count	No. of Patients	Percentage
1.	Clean	1	1.0
2.	Clean Contaminated	85	85.0
3.	Contaminated	12	12.0
4.	Dirty	2	2.0
	Total	**100**	**100.0**

CHART NO. 14

TYPE OF WOUND



Majority of surgical wound in our study was clean contaminated.

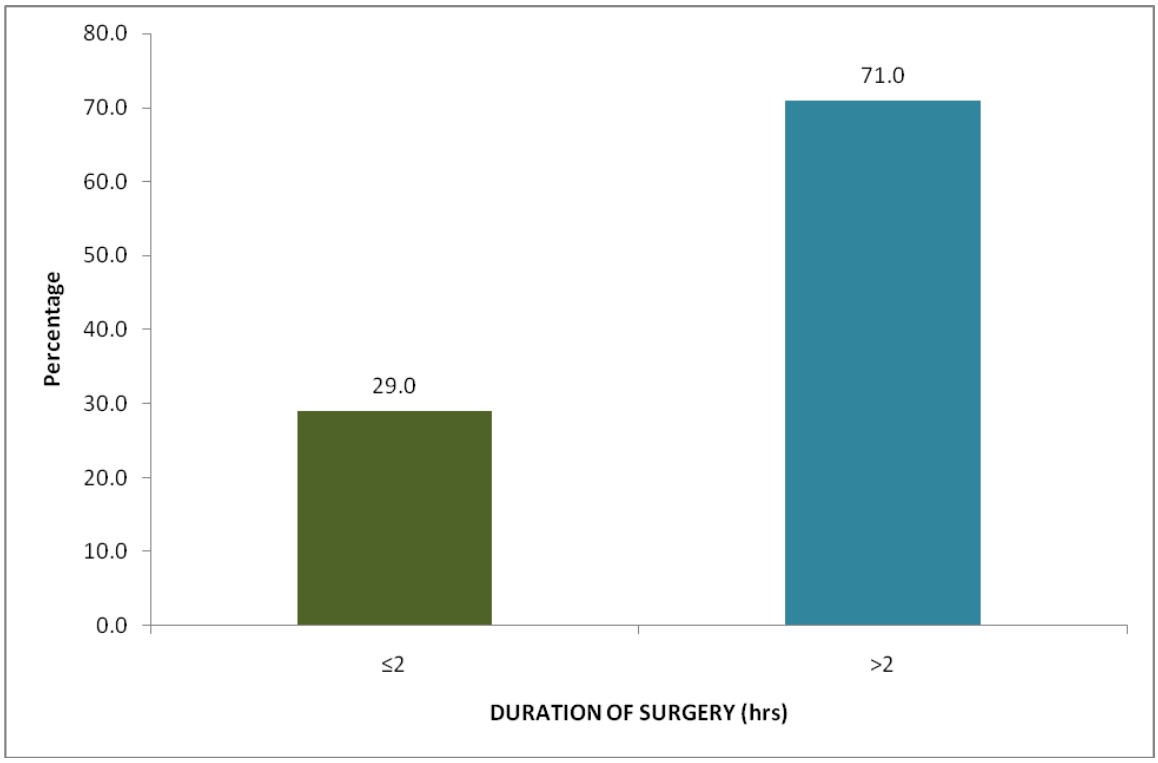
TABLE NO. 15

DURATION OF SURGERY (hrs)

S. No.	Duration	No. of Patients	Percentage
1.	≤2	29	29.0
2.	>2	71	71.0
	Total	**100**	**100.0**

CHART NO. 15

DURATION OF SURGERY (hrs)



Duration of surgery was > 2 hrs for 71 procedures.

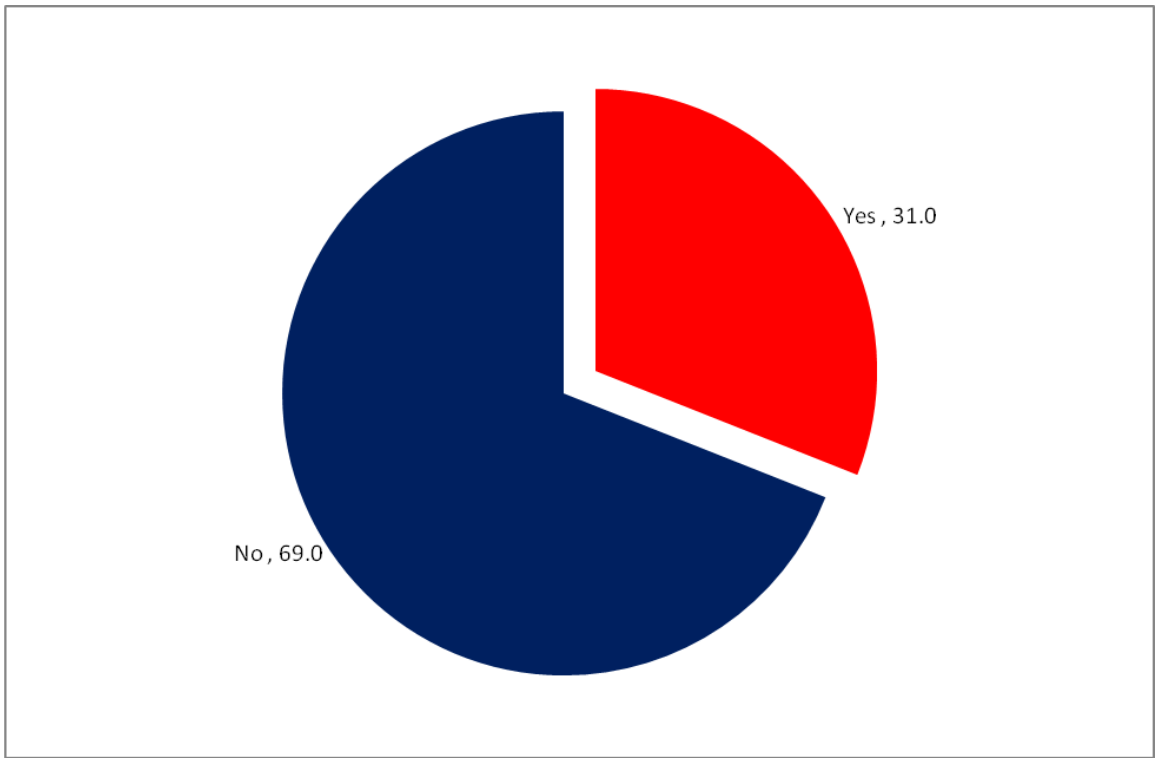
TABLE NO. 16

DRAIN TUBE PLACED

S. No.	Opinion	No. of Patients	Percentage
1.	Yes	31	31.0
2.	No	69	69.0
	Total	**100**	**100.0**

CHART NO. 16

DRAIN TUBE PLACED



Drainage tube was placed in 31 surgeries.

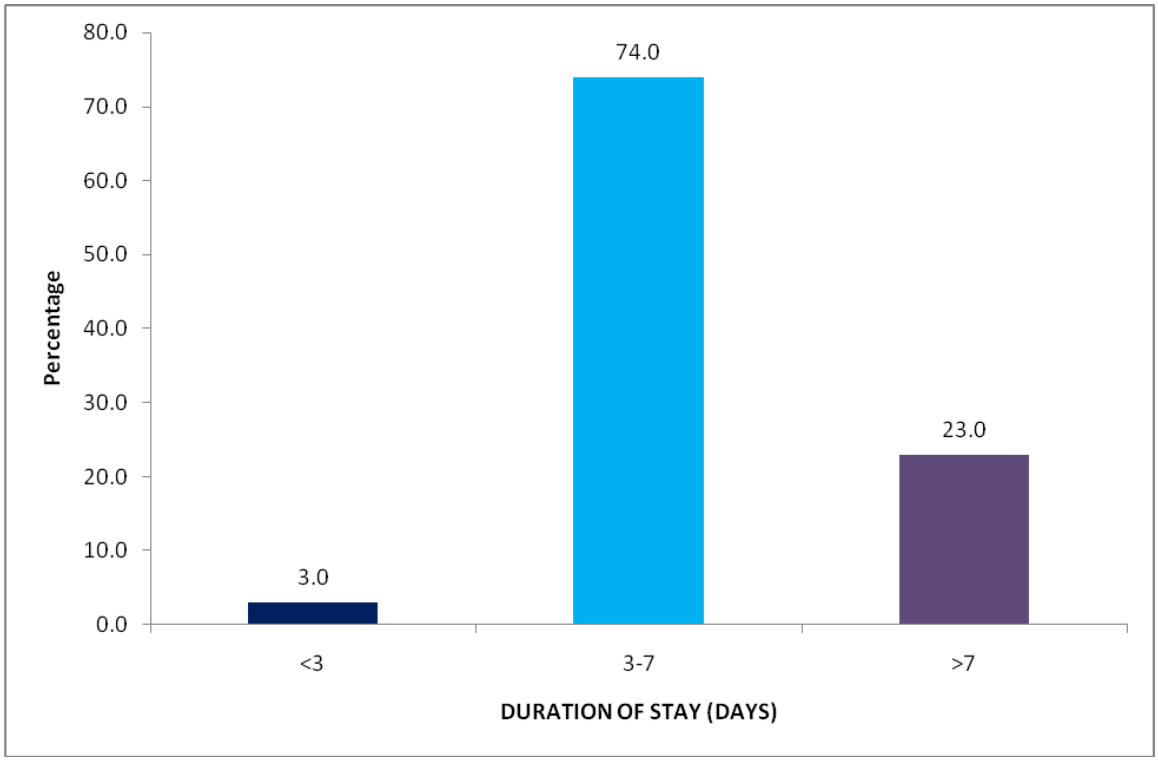
TABLE NO. 17

DURATION OF STAY (DAYS) (POST OP)

S. No.	Days	No. of Patients	Percentage
1.	<3	3	3.0
2.	3-7	74	74.0
3.	>7	23	23.0
	Total	**100**	**100.0**

CHART NO. 17

DURATION OF STAY (DAYS) (POST OP)



74 patients had post operative stay period of 3 to 7 days. 23 patients had prolonged hospital stay .14 patients who developed SSI had prolonged post operative stay.

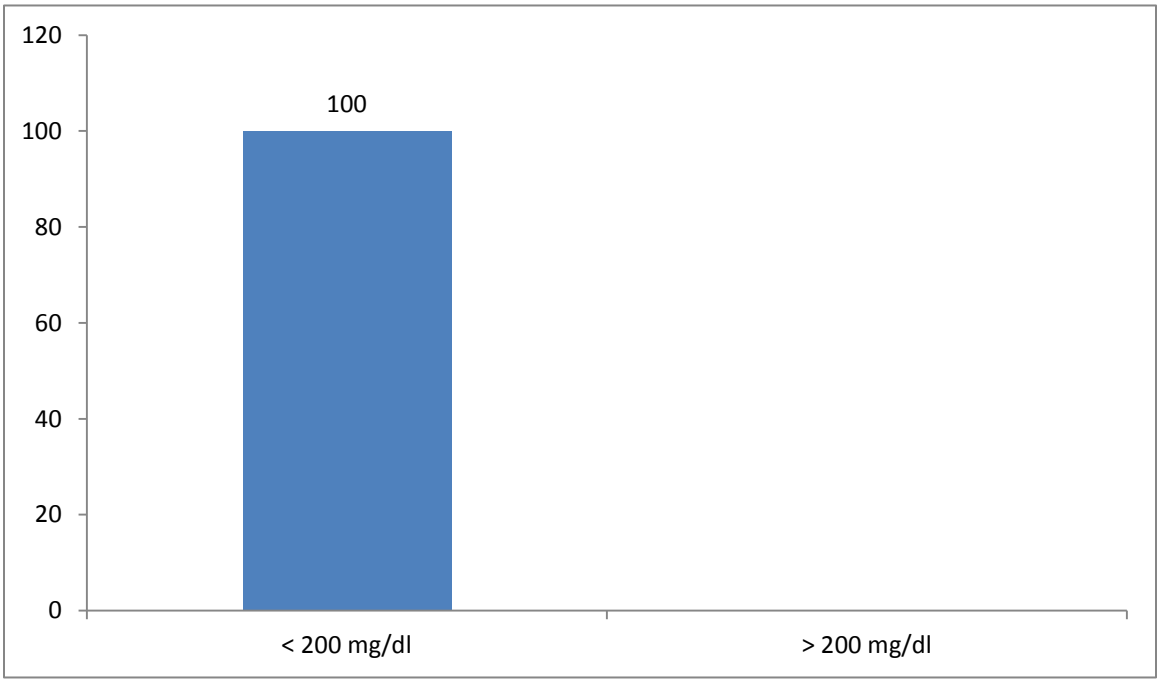
TABLE NO. 18

GLYCEMIC CONTROL (RBS) (mg/dl) (POST OP)

S. No.	Count	No. of Patients	Percentage
1.	<200	100	100.0
2.	≥200	-	-
	Total	**100**	**100.0**

CHART NO. 18

GLYCEMIC CONTROL (RBS) (mg/dl) (POST OP)



All patients were under glycemic control during the post operative period.

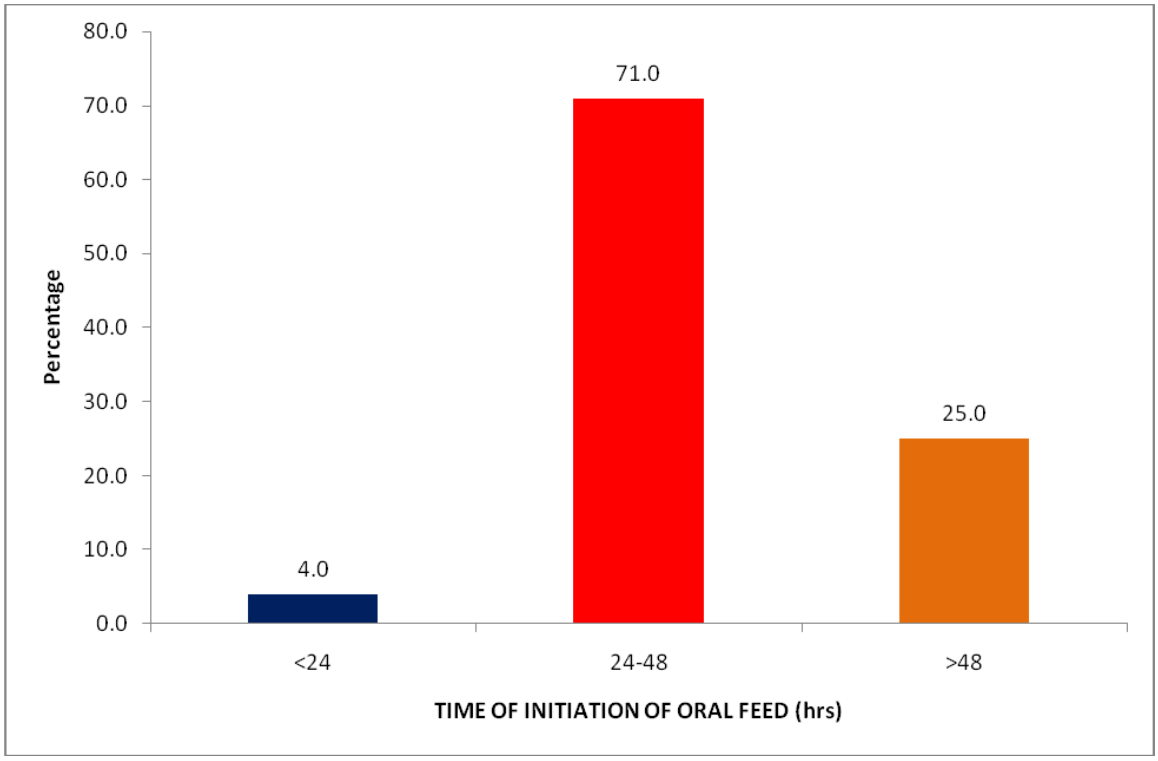
TABLE NO. 19

TIME OF INITIATION OF ORAL FEED (hrs)

S. No.	Hours	No. of Patients	Percentage
1.	<24	4	4.0
2.	24-48	71	71.0
3.	>48	25	25.0
	Total	**100**	**100.0**

CHART NO. 19

TIME OF INITIATION OF ORAL FEED (hrs)



71 patients were started on oral feeds between 24 and 48 hours.

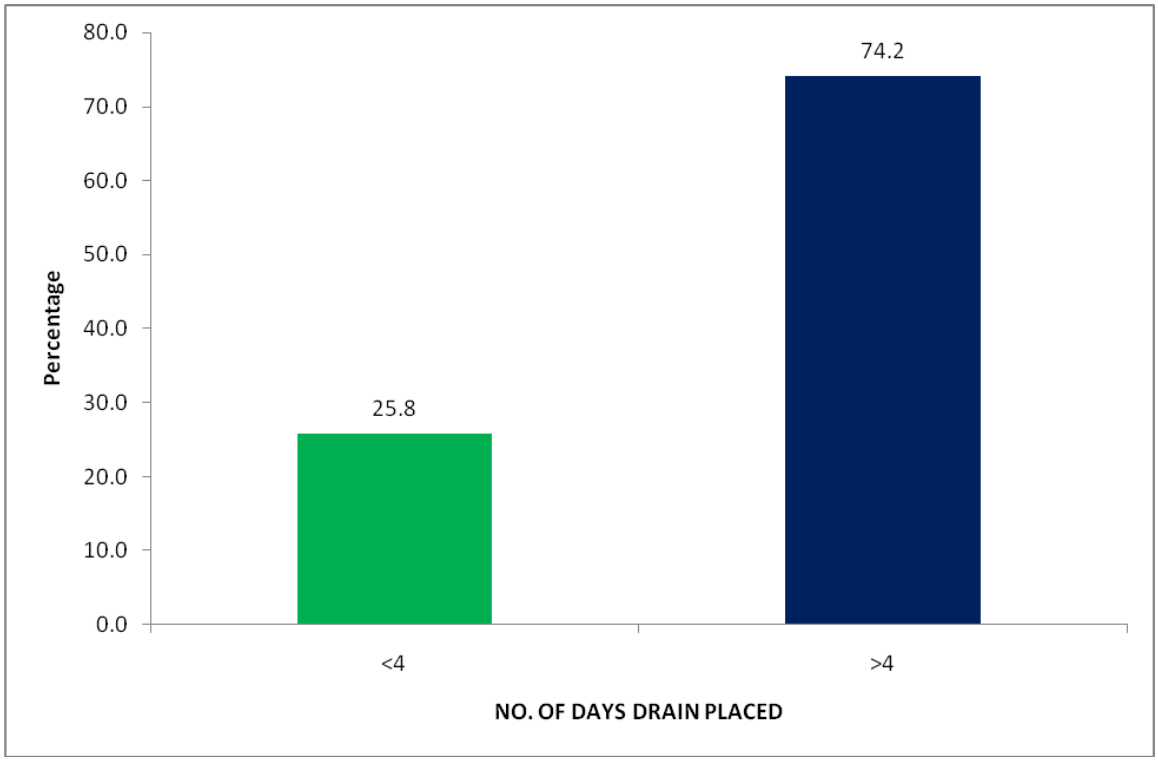
TABLE NO. 20

NO. OF DAYS DRAIN PLACED

S. No.	Days	No. of Patients	Percentage
1.	<4	8	25.8
2.	>4	23	74.2
	Total	**31**	**100.0**

CHART NO. 20

NO. OF DAYS DRAIN PLACED



23 patients had drain placed for more than 4 days out of which 14 patients developed SSI

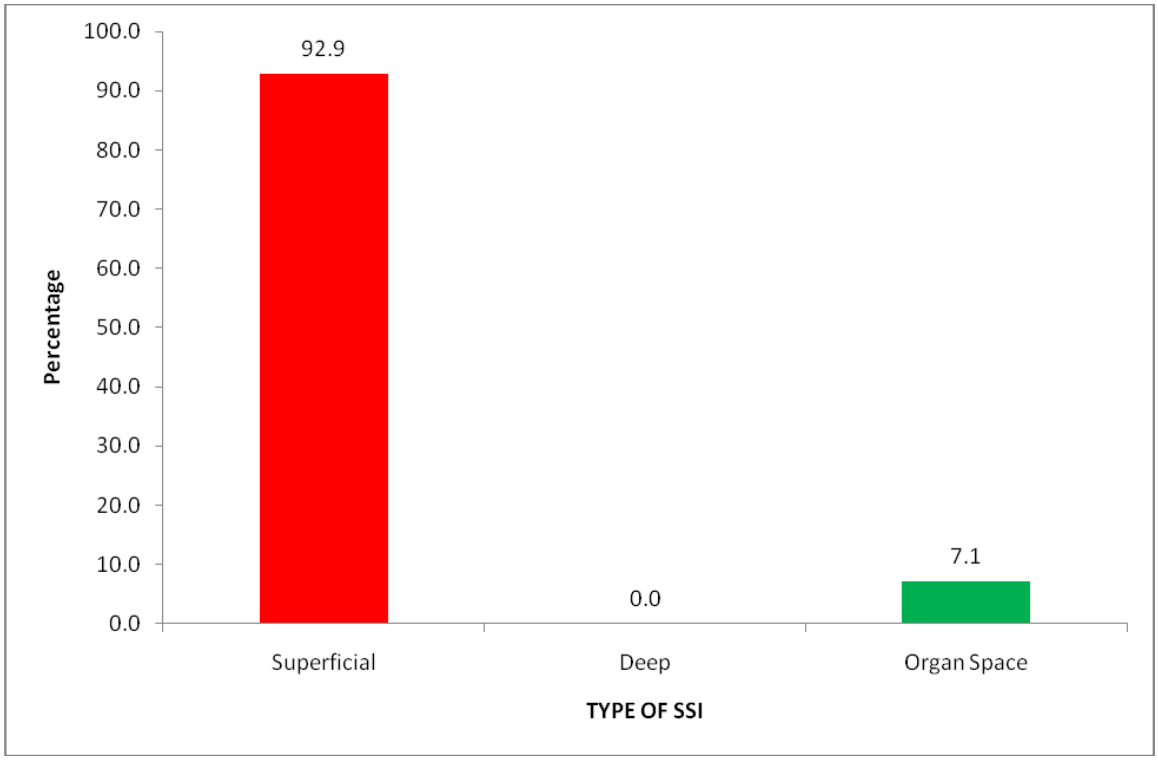
TABLE NO. 21

TYPE OF SSI

S. No.	Days	No. of Patients	Percentage
1.	Superficial	13	92.9
2.	Deep	0	0.0
3.	Organ Space	1	7.1
	Total	**14**	**100.0**

CHART NO. 21

TYPE OF SSI



Out of 14 patients who developed SSI, 13 had superficial SSI. 1 had organ space SSI. No patients had deep incisional SSI. The details of patient with SSI in our study are analysed in the following graphs.

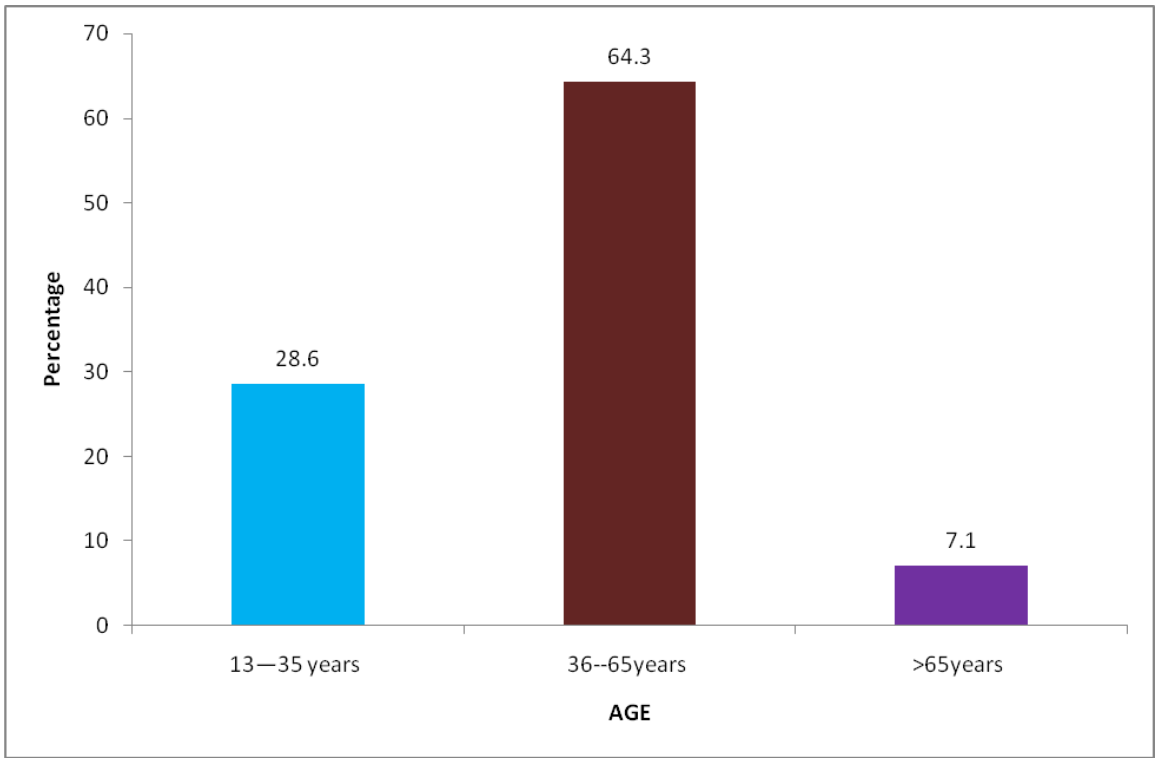
TABLE NO. 22

AGE - SSI

S. No.	Age	No. of Patients	Percentage
1.	13—35 years	4	28.6
2.	36--65years	9	64.3
3.	>65years	1	7.1
	Total	**14**	**100.0**

CHART NO. 22

AGE - SSI



Out 14 patients 9 were 35-65 years of age. The infection rate is 18.4% (9/49) in this age group while that in age >65years is 25% (1/4)**.**

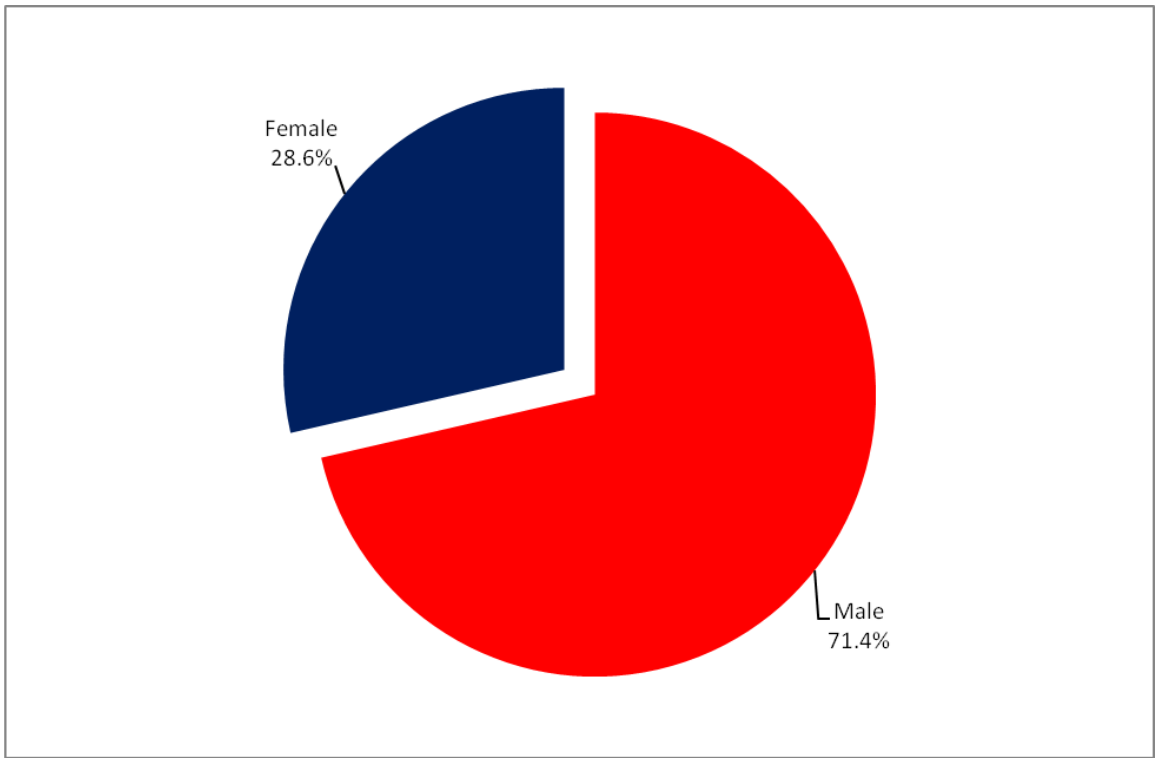
TABLE NO. 23

GENDER - SSI

S. No.	Gender	No. of Patients	Percentage
1.	Male	10	71.4
2.	Female	4	28.6
	Total	**14**	**100.0**

CHART NO. 23

GENDER- SSI



10 out of 14 patients with SSI were males. Both age and sex were found not to be associated with SSI in our study.

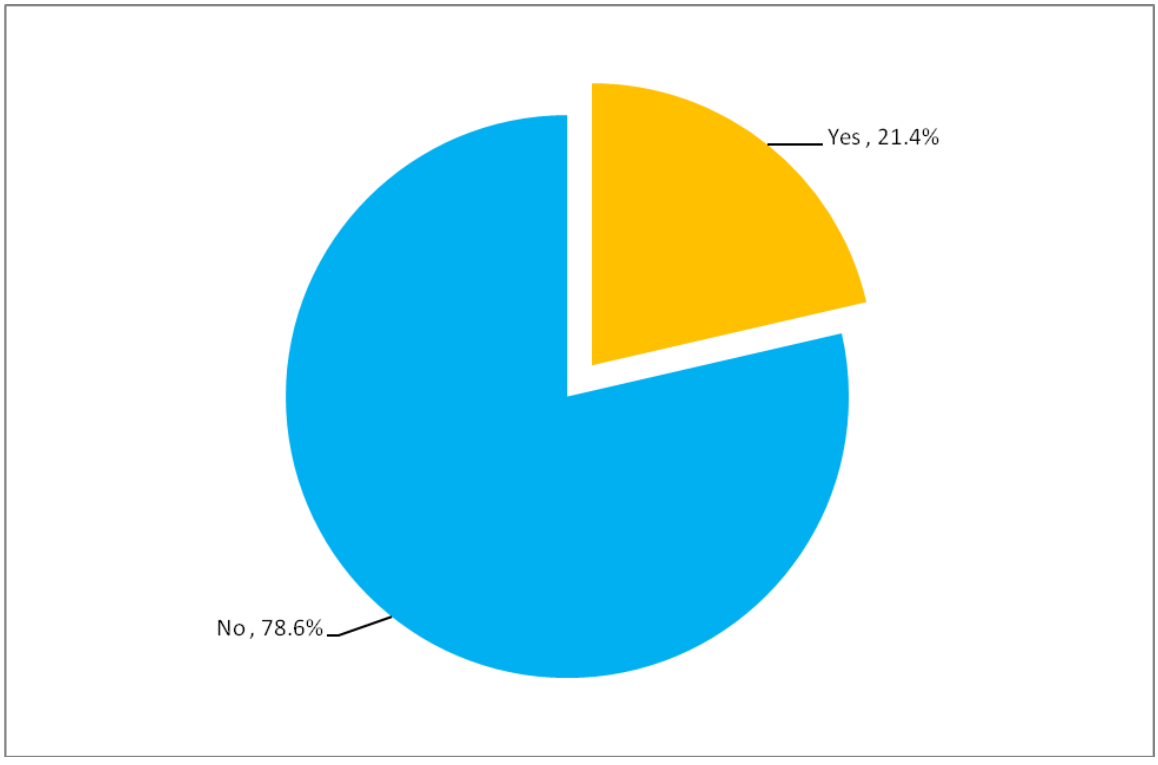
TABLE NO. 24

DM - SSI

S. No.	Opinion	No. of Patients	Percentage
1.	Yes	3	21.4
2.	No	11	78.6
	Total	**14**	**100.0**

CHART NO. 24

DM - SSI



3 patients who had diabetes mellitus developed SSI. The infection rate was 25% (3/12). Diabetes mellitus was not a risk factor for SSI in our study.

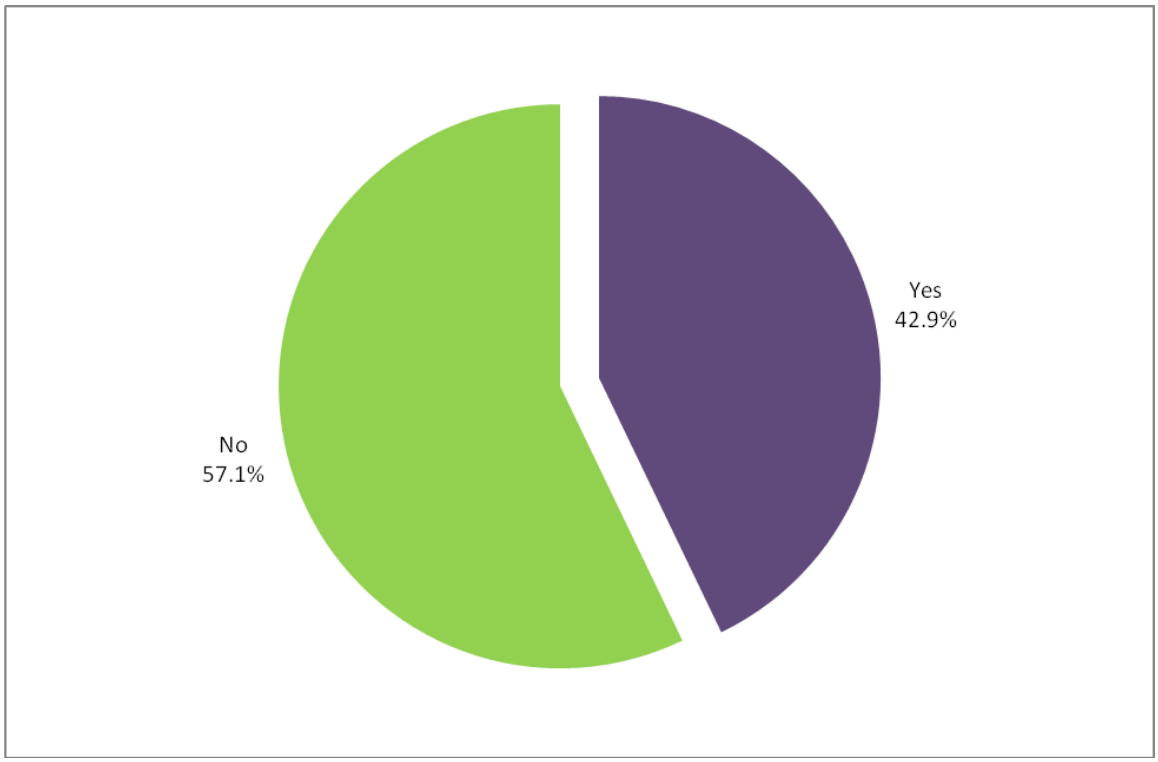
TABLE NO.25

SMOKING - SSI

S. No.	Opinion	No. of Patients	Percentage
1.	Yes	6	42.9
2.	No	8	57.1
	Total	**14**	**100.0**

CHART NO. 25

SMOKING -SSI



6 out of 14 patients with SSI were smokers. The infection rate among smokers is 42.9%. Smoking is found to be associated with SSI in our study (P=0.001).

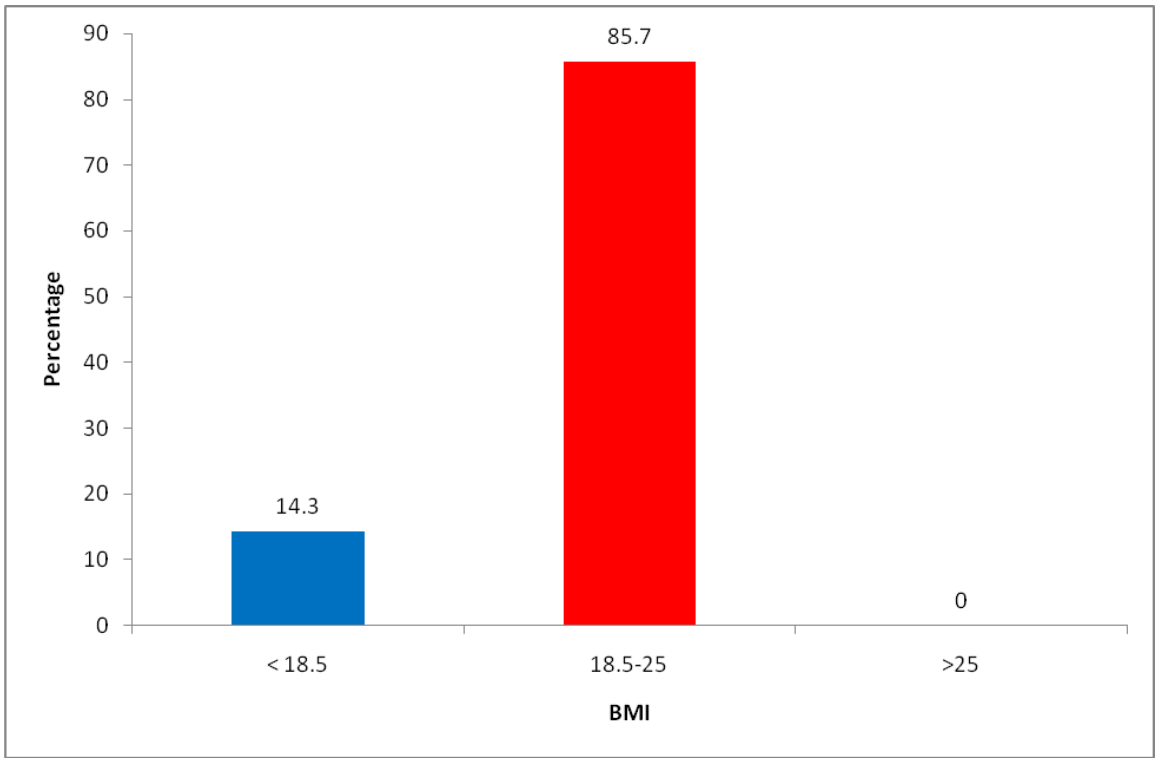
TABLE NO. 26

BMI - SSI

S. No.	BMI	No. of Patients	Percentage
1.	< 18.5	2	14.3
2.	18.5-25	12	85.7
3.	>25	0	0.0
	Total	**14**	**100.0**

CHART NO. 26

BMI - SSI



Out of 14 patients who developed SSI 12 were in the normal BMI. Both undernutrition & obesity were not found to be associated with SSI in our study.

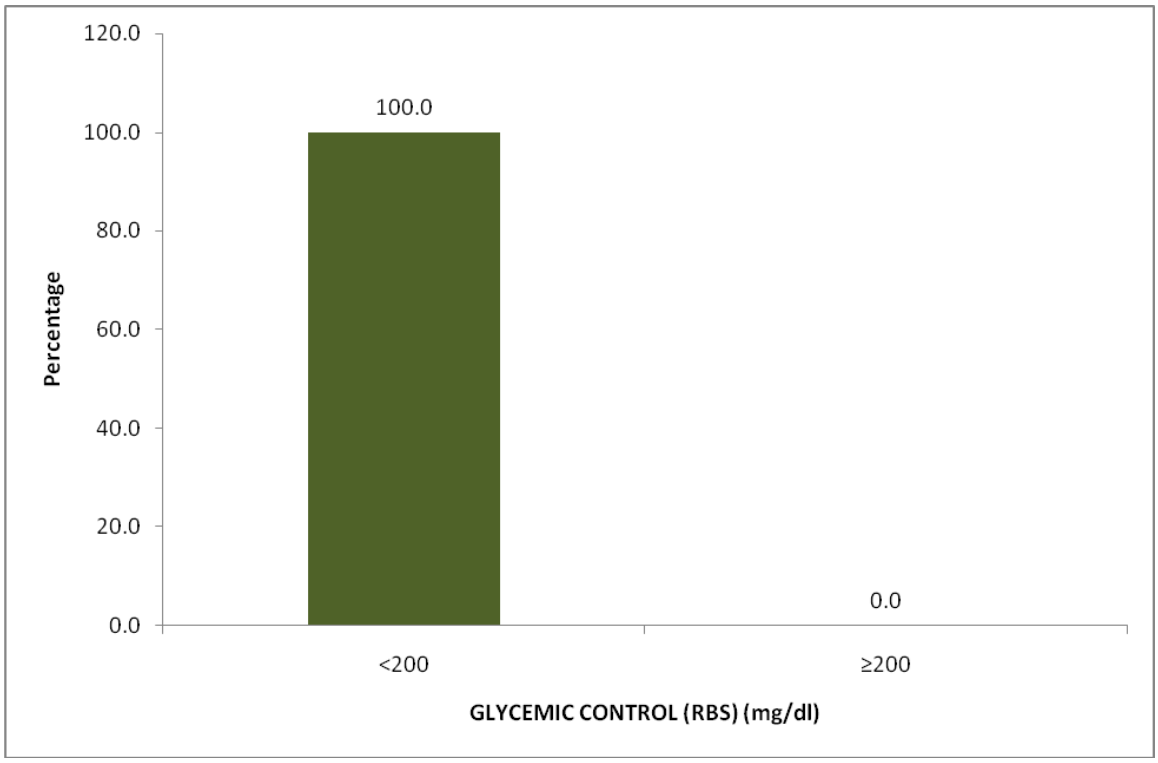
TABLE NO. 27

GLYCEMIC CONTROL (RBS) (mg/dl) - SSI

S. No.	Days	No. of Patients	Percentage
1.	<200	14	100.0
2.	≥200	0	0.0
	Total	**14**	**100.0**

CHART NO. 27

GLYCEMIC CONTROL (RBS) (mg/dl) - SSI



All patients who developed SSI were under glycemic control both during preoperative & post operative period. So we could not establish any association between SSI and perioperative hyperglycemia in our study.

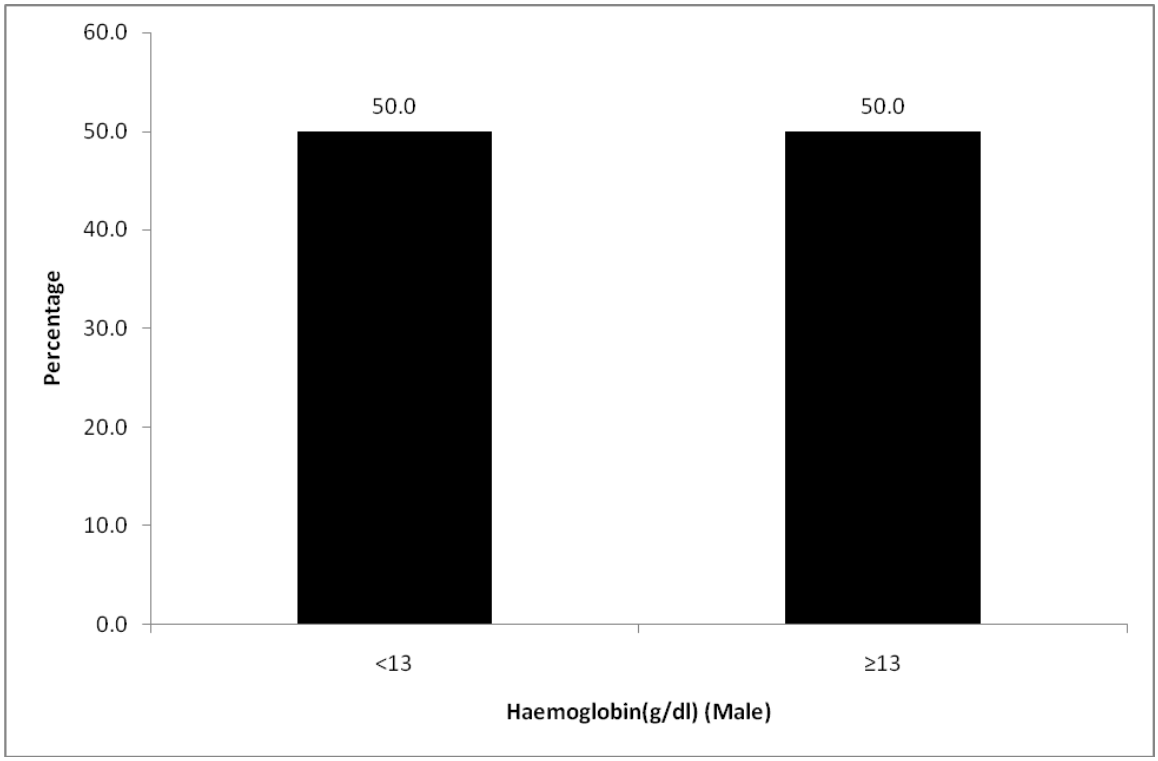
TABLE NO. 28

HAEMOGLOBIN (g/dl) (Male) - SSI

S. No.	Count	No. of Patients	Percentage
1.	<13	5	50.0
2.	≥13	5	50.0
	Total	**10**	**100.0**

CHART NO. 28

HAEMOGLOBIN (g/dl) (Male) - SSI



50% of patients with SSI had anaemia. The infection rate among male with anaemia is 19.2%(5/26), which is not statistically significant.

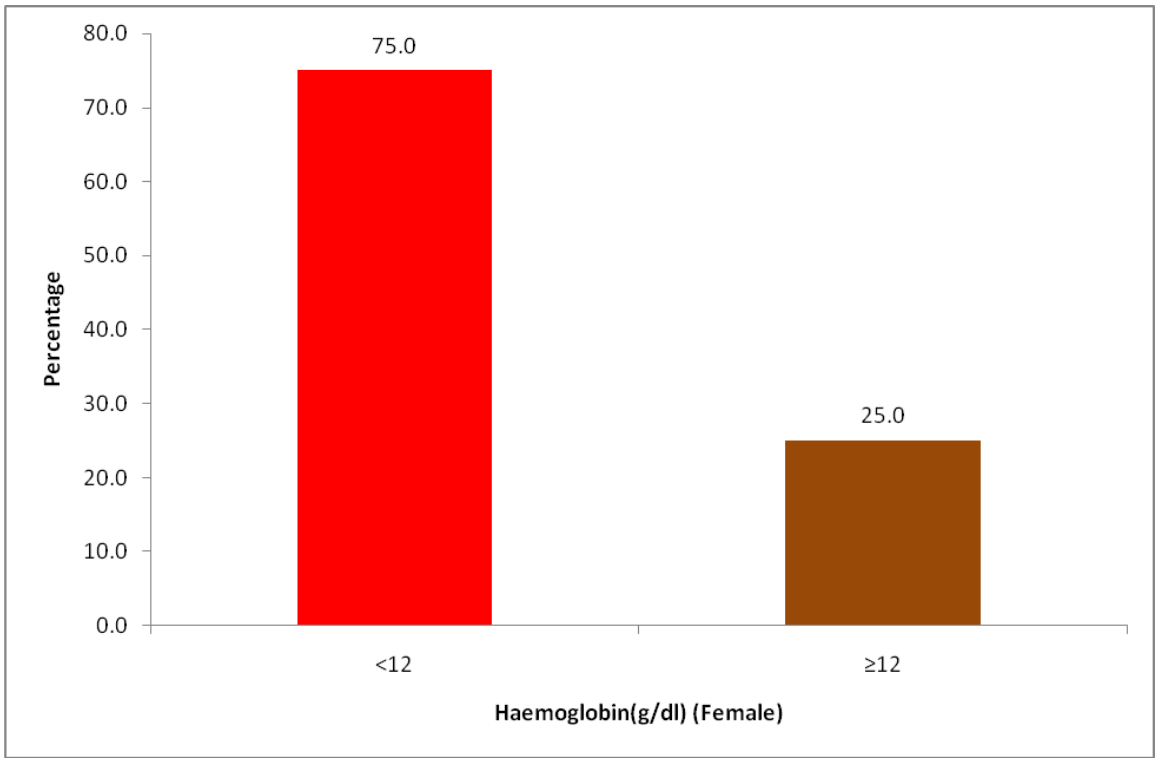
TABLE NO. 29

HAEMOGLOBIN (g/dl) (Female) - SSI

S. No.	Count	No. of Patients	Percentage
1.	<12	3	75.0
2.	≥12	1	25.0
	Total	**4**	**100.0**

CHART NO. 29

HAEMOGLOBIN (g/dl) (Female) - SSI



Out of 4 female patients who developed SSI, 3 were found to have anaemia. But the infection rate is 10.3% (3/26) in female patients with anemia. Anaemia in both females and males were not associated with SSI in our study.

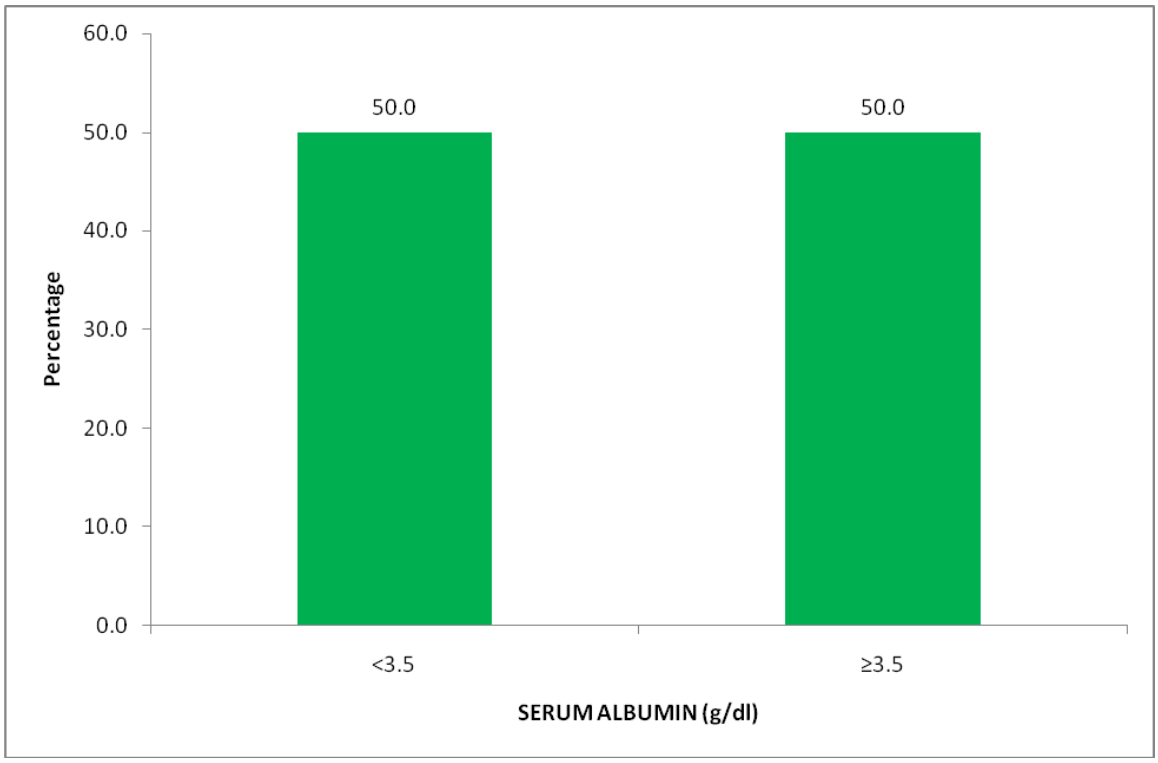
TABLE NO. 30

SERUM ALBUMIN (g/dl) - SSI

S. No.	Count	No. of Patients	Percentage
1.	<3.5	7	50.0
2.	≥3.5	7	50.0
	Total	**14**	**100.0**

CHART NO. 30

SERUM ALBUMIN (g/dl) - SSI



7 patients with SSI had low serum albumin level. The infection rate is 20% (7/35) in patients with hypoalbuminemia, which is not statistically significant.

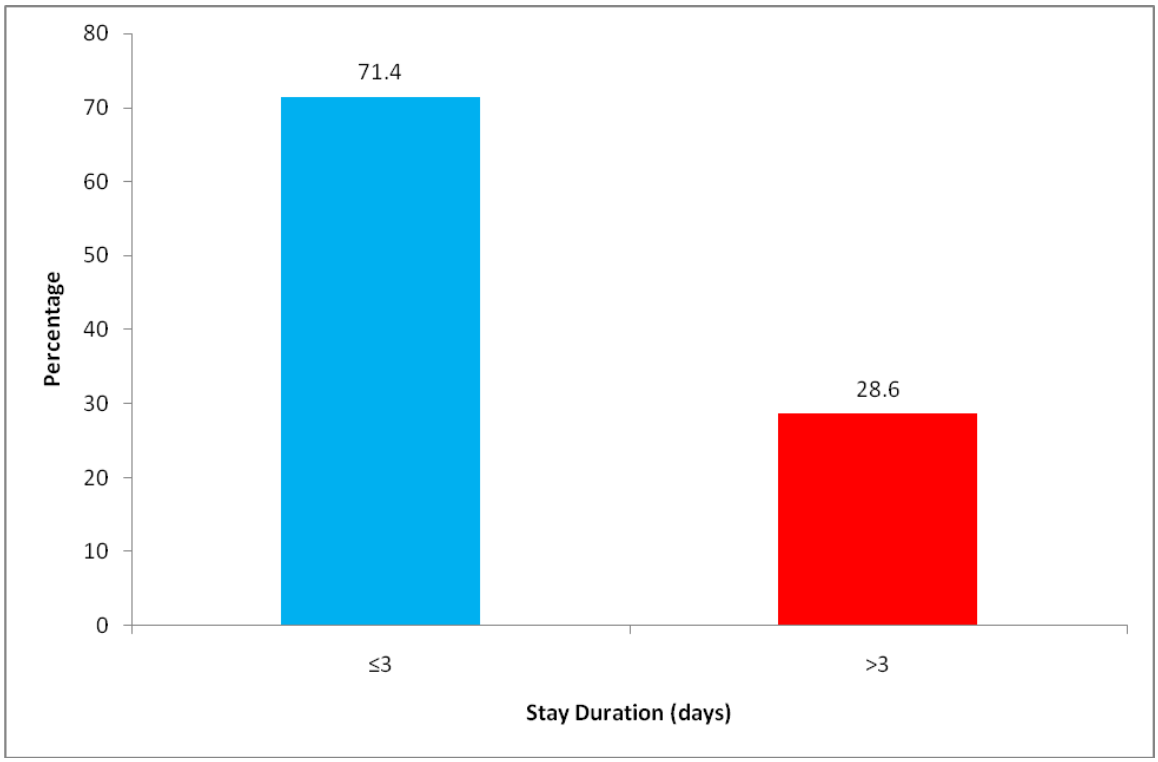
TABLE NO. 31

PRE OPERATIVE STAY DURATION (DAYS) - SSI

S. No.	Days	No. of Patients	Percentage
1.	≤3	10	71.4
2.	>3	4	28.6
	Total	**14**	**100.0**

CHART NO. 31

PRE OPERATIVE STAY DURATION (DAYS) - SSI



4 patients had preoperative stay period of > 3 days. The infection rate among them is 80% (4/5), which is significantly associated with SSI (P=0.000).

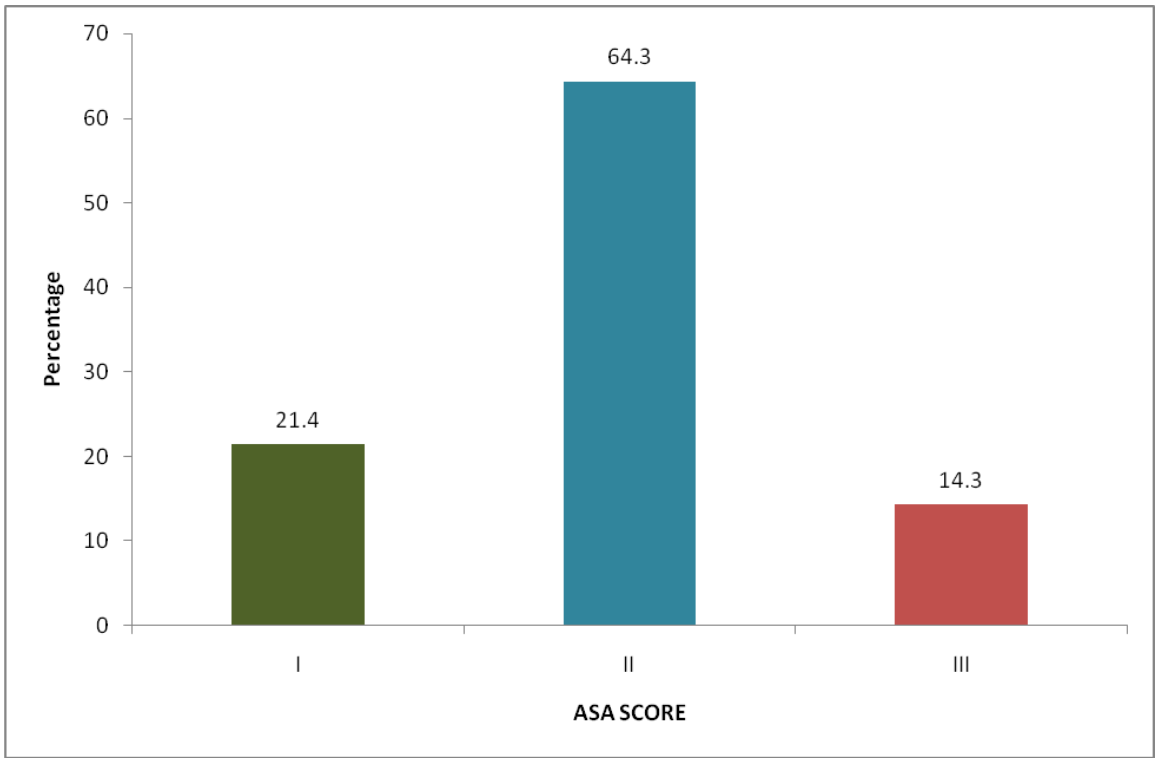
TABLE NO. 32

ASA SCORE

S. No.	Score	No. of Patients	Percentage
1.	I	3	21.4
2.	II	9	64.3
3.	III	2	14.3
	Total	**14**	**100.0**

CHART NO. 32

ASA SCORE



The infection rate in patients with ASA class II is 28.1% (9/32) and class III is 50%(2/4). Higher ASA score is significantly associated with SSI in our study (p=0.001).

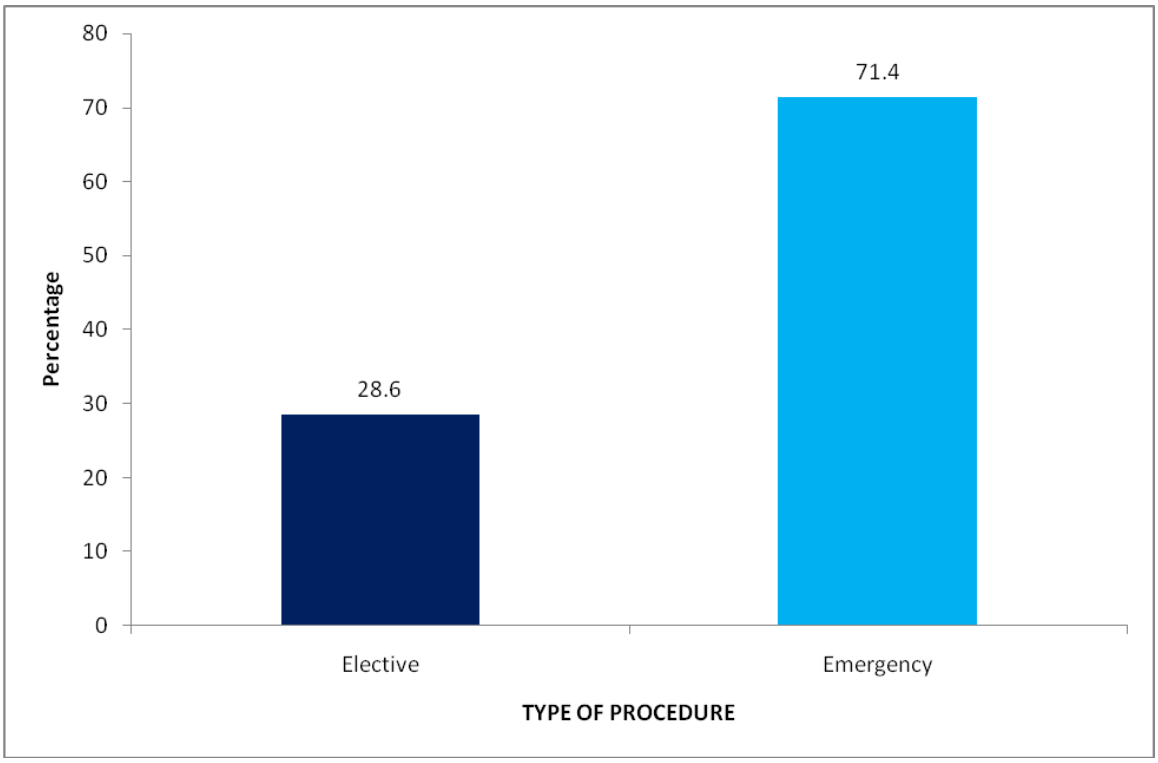
TABLE NO. 33

TYPE OF PROCEDURE

S. No.	Count	No. of Patients	Percentage
1.	Emergency	10	71.4
2.	Elective	4	28.6
	Total	**14**	**100.0**

CHART NO. 33

TYPE OF PROCEDURE



Out of 14 patients with SSI, 10 patients have undergone emergency procedure. The infection rate in patients who underwent emergency procedure is 12% (10/83) as compared to that elective is 23.5% (4/17)**.**

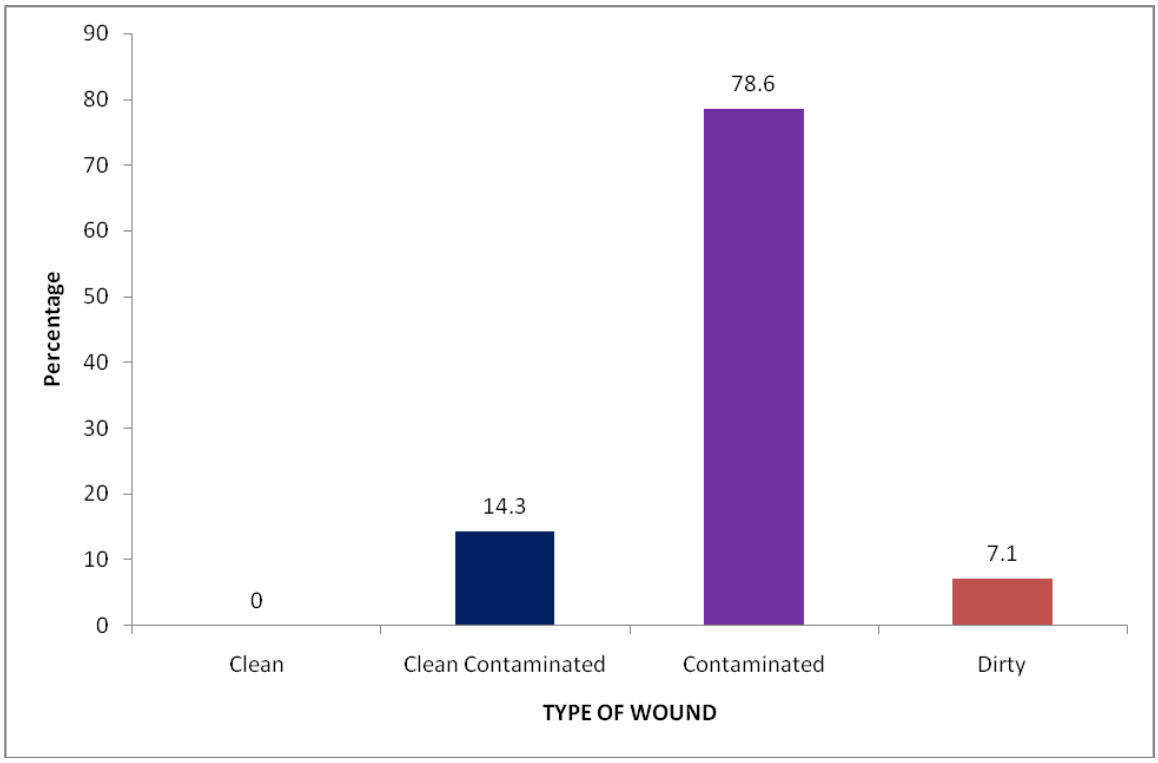
TABLE NO. 34

TYPE OF WOUND

S. No.	Count	No. of Patients	Percentage
1.	Clean	0	0.0
2.	Clean Contaminated	2	14.3
3.	Contaminated	11	78.6
4.	Dirty	1	7.1
	Total	**14**	**100.0**

CHART NO. 34

TYPE OF WOUND



In our study contaminated and dirty wounds are significantly associated with SSI (p=0.000). 11 cases out of 14 were found to have contaminated wound.

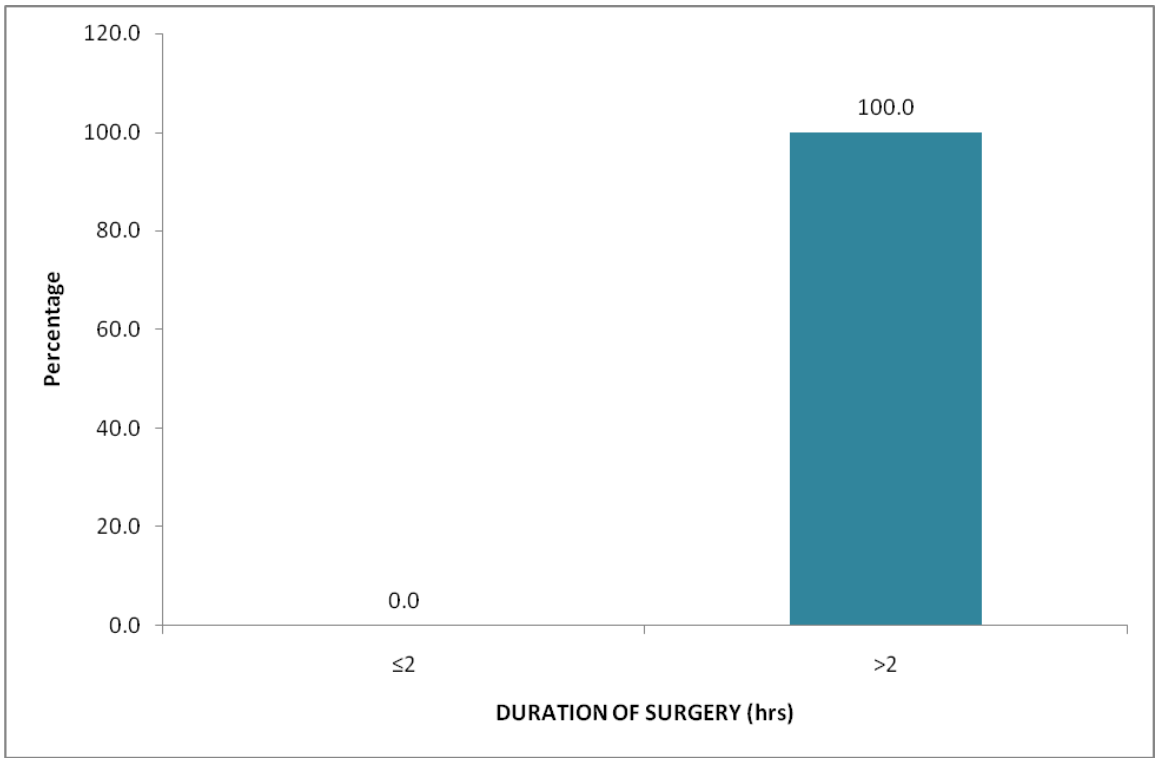
TABLE NO. 35

DURATION OF SURGERY (hrs)

S. No.	Duration	No. of Patients	Percentage
1.	≤2	0	0.0
2.	>2	14	100.0
	Total	**14**	**100.0**

CHART NO. 35

DURATION OF SURGERY (hrs)



All patients with SSI had surgery duration of > 2hours. This is significantly associated with SSI in our study (p=0.009)

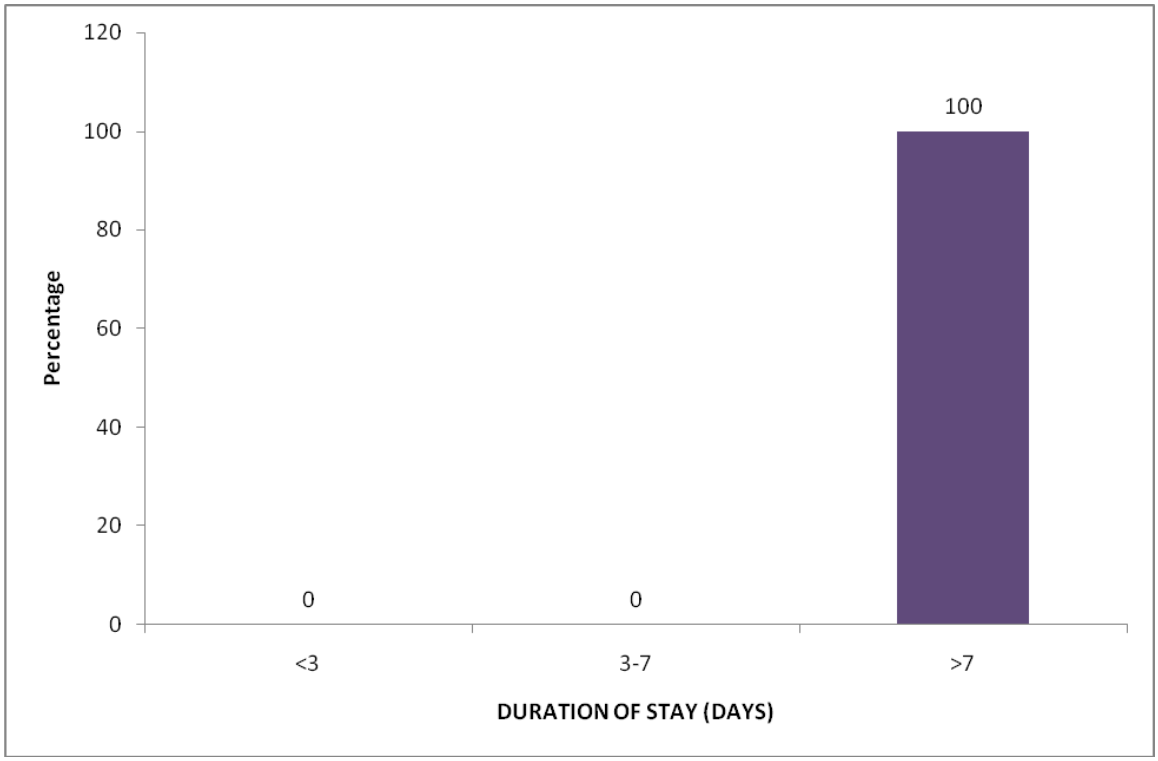
TABLE NO. 36

POST OPERATIVE DURATION OF STAY (DAYS)

S. No.	Days	No. of Patients	Percentage
1.	<3	0	0.0
2.	3-7	0	0
3.	>7	14	100.0
	Total	**14**	**100.0**

CHART NO. 36

POST OPERATIVE DURATION OF STAY (DAYS)



All patients with SSI had prolonged post operative stay. Wound dressing, administration of intra venous antibiotics & secondary suturing accounts for the prolonged stay.

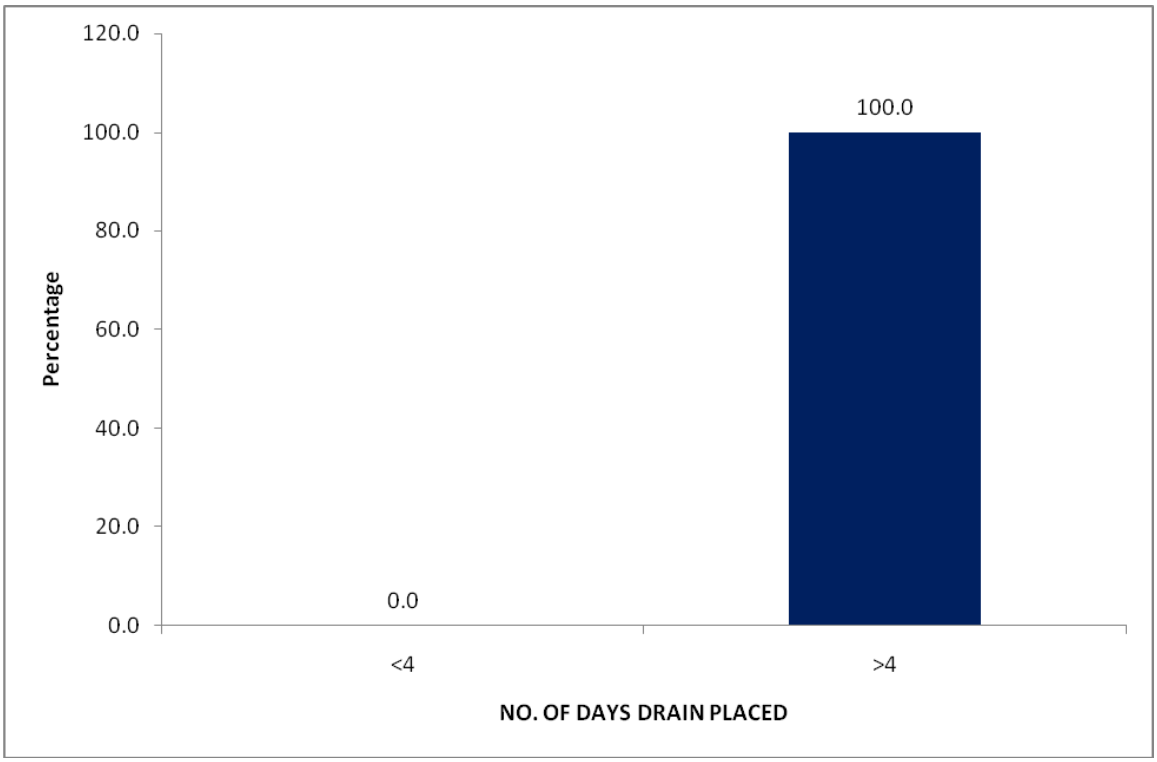
TABLE NO. 37

NO. OF DAYS DRAIN PLACED

S. No.	Days	No. of Patients	Percentage
1.	<4	0	0.0
2.	>4	14	100.0
	Total	**14**	**100.0**

CHART NO. 37

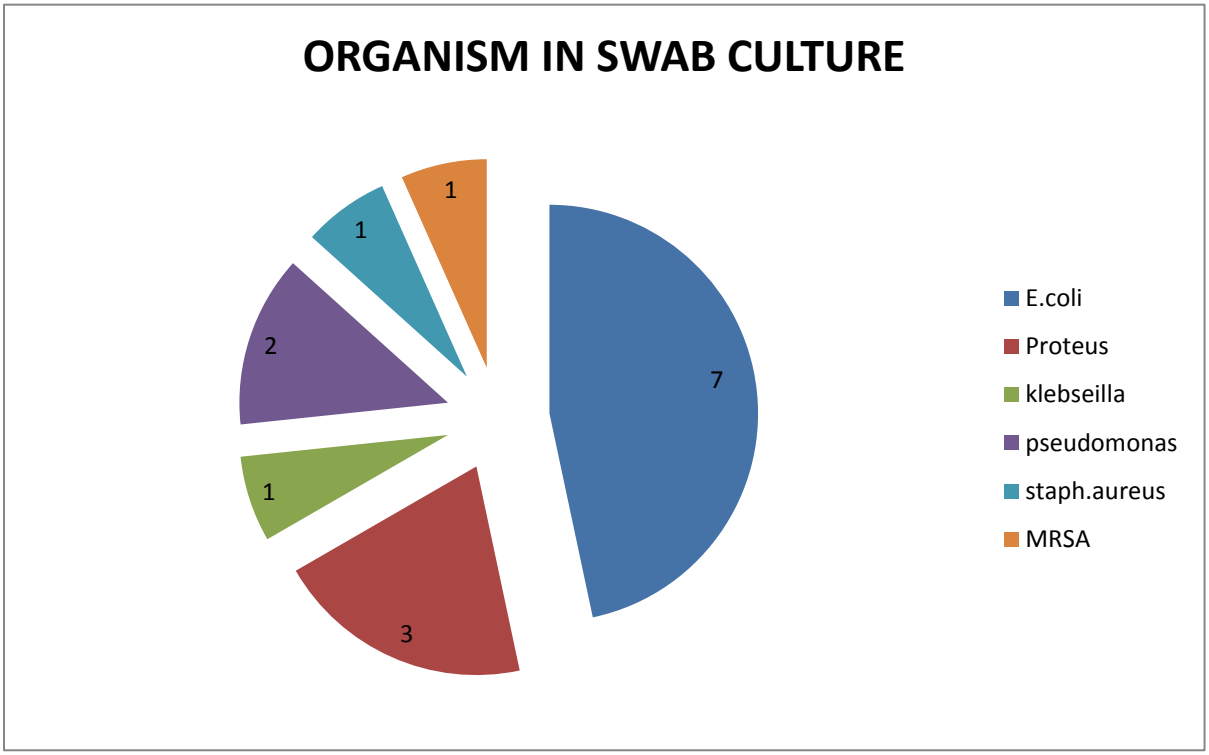
NO. OF DAYS DRAIN PLACED



All patients with SSI had drain placed for >4 days. This is significantly associated with SSI (p=0.0000)

TABLE NO. 38
ORGANISM GROWN IN SWAB CULTURE

S. No	Organism Grown	Frequency
1.	Escherichia Coli	7
2.	Proteus mirabilis	3
3.	Klebseilla pneumonia	1
4.	Pseudomonas aeruginosa	2
5.	Staphylococcus aureus	1
6.	Methicillin resistant Staph aureus	1



More than 1 organism was isolated in the swab culture of 5 patients. The most common organism isolated was Escherichia coli.

TABLE NO. 39

Procedure wise distribution of SSI

S. No.	Diagnosis	Procedure	Frequency
1.	Appendicular perforation with abscess	Open appendicectomy with peritoneal Lavage	1
2.	Acute appendicitis with abscess	Open appendicectomy	2
3.	Appendicular abscess /intraabdominal sepsis	Laporotomy	1
4.	Duodenal perforation	Exploratory laparotomy & graham's omental patch repair	4
5.	Ileal perforation	Exploratory laparotomy & ileal resection and anastamosis	2
6.	Carcinoma rectum	Abdomino perineal resection with end colostomy	1
7.	Carcinoma stomach	Laparotomy,subtotal gastrectomy agj,jj	2
8.	Cholelithiasis and choledocholithiasis	Open cholecystectomy with CBD exploration	1

CHI-SQUARE ANALYSIS

TABLE NO. 40

RELATIONSHIP BETWEEN CLINICAL PARAMETERS AND INCIDENCE OF SSI

No.	Parameters	SSI Present Frequency (%)	SSI Absent Frequency (%)	Total	χ^2	DF	'p' Value
	Age						
1.	13—35 years	4 (8.5)	43 (91.5)	47 (100.0)	2.355	2	0.308^{NS}
2.	36--65years	9 (18.4)	40 (81.6)	49 (100.0)			
3.	>65years	1 (25.0)	3 (75.0)	4 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	Gender						
1	Male	10 (17.5)	47 (82.5)	57 (100.0)	1.383	1	0.240^{NS}
2	Female	4 (9.3)	39 (90.7)	43 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	DM						
1	Yes	3 (25.0)	9 (75.0)	12 (100.0)	1.370	1	0.242^{NS}
2	No	11 (12.5)	77 (87.5)	88 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	Smoking						
1	Yes	6 (42.9)	8 (57.1)	14 (100.0)	11.259	1	**0.001****
2	No	8 (9.3)	78 (90.7)	86 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	BMI						
1	< 18.5	2 (18.2)	9 (81.8)	11 (100.0)	0.332	2	0.847^{NS}
2	18.5-25	12 (13.6)	76 (86.4)	88 (100.0)			
3	>25	0 (0.0)	1 (100.0)	1 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	Random Blood Sugar						

No.	Parameters	SSI Present Frequency (%)	SSI Absent Frequency (%)	Total	χ^2	DF	'p' Value
1	<200	14 (14.4)	83 (85.6)	97 (100.0)	0.503	1	0.478^{NS}
2	≥200	0 (0.0)	3 (100.0)	3 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	Hb Male						
1	<13	5 (19.2)	21 (80.8)	26 (100.0)	0.131	1	0.718^{NS}
2	≥13	5 (15.6)	27 (84.4)	32 (100.0)			
	Total	10 (17.2)	48 (82.8)	58 (100.0)			
	Hb Female						
1	<12	3 (10.3)	26 (89.7)	29 (100.0)	0.073	1	0.787^{NS}
2	≥12	1 (7.7)	12 (92.3)	13 (100.0)			
	Total	4 (9.5)	38 (90.5)	42 (100.0)			
	Albumin						
1	<3.5	7 (20.0)	28 (80.0)	35 (100.0)	1.610	1	0.204^{NS}
2	≥3.5	7 (10.8)	58 (89.2)	65 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	Stay Duration (Days) (Pre OP)						
1	≤3	10 (10.5)	85 (89.5)	95 (100.0)	19.042	1	**0.000****
2	>3	4 (80.0)	1 (20.0)	5 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	ASA Score						
1	I	3 (4.7)	61 (95.3)	64 (100.0)	14.218	2	**0.001****
2	II	9 (28.1)	23 (71.9)	32 (100.0)			
3	III	2 (50.0)	2 (50.0)	4 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	Type of Procedure						
1	Emergency	10 (12.0)	73 (88.0)	83 (100.0)	1.545	1	0.214^{NS}
2	Elective	4 (23.5)	13 (76.5)	17 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			

No.	Parameters	SSI Present Frequency (%)	SSI Absent Frequency (%)	Total	χ^2	DF	'p' Value
	Type of Wound						
1	Clean	0 (0.0)	1 (100.0)	1 (100.0)	72.013	3	**0.000****
2	Clean Contaminated	2 (2.4)	83 (97.6)	85 (100.0)			
3	Contaminated	11 (91.7)	1 (8.3)	12 (100.0)			
4	Dirty	1 (50.0)	1 (50.0)	2 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	Duration of Surgery						
1	≤2	0 (0.0)	29 (100.0)	29 (100.0)	6.649	1	**0.009****
2	>2	14 (19.7)	57 (80.3)	71 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	Duration of Stay (Days) (Post)						
1	<3	0 (0.0)	3 (100.0)	3 (100.0)	54.499	2	**0.000****
2	3-7	0 (0.0)	74 (100.0)	74 (100.0)			
3	>7	14 (60.9)	9 (39.1)	23 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			
	No. of Days Drain Placed						
1	<4	0 (0.0)	8 (100.0)	8 (100.0)	8.879	1	**0.000****
2	>4	14 (60.9)	9 (39.1)	23 (100.0)			
	Total	14 (14.0)	86 (86.0)	100 (100.0)			

Note : ** - $p<0.001$; NS – Not Significant

DISCUSSION

Large number of studies reported surgical site infection in abdominal surgeries between 3.4% and 36.1% [96]. In our study out of 100 patients who underwent abdominal surgeries, 14 patients developed SSI. The rate of SSI I in our study is 14%. This is comparable to many studies in India[95, 96, 107] and is higher compared to developed countries and less as compared to few Indian studies[97.] 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. In our study most of patients are of middle age group (35-65years) and there is male preponderance. The risk factors associated with SSI in our study are smoking (p=0.001), pre operative stay of > 3days (p=0.000), ASA score (p=0.001), contaminated & dirty wound (p=0.000), duration of surgery (p= 0.010) & duration drain placement (p=0.000). Our study did not find association between SSI and BMI grading, anaemia, hypoalbuminemia. In our study Smoking was found to be associated with SSI like previous studies[97.] The infection rate among smokers is 42.9% (6/14) while that in non smokers is 9.3% (8/86). Pre operative stay duration of > 3 days is significantly associated with SSI. The infection rate is 80% in patients with pre operative stay of

> 3 days as compared to 10.5% in patients with < 3 days duration. Similar finding is observed in many studies[95, 96, 100, 102, 103, 106, 108.]

Patients with ASA class of 2 & 3 are associated with SSI. This is comparable to previous studies[97, 98, 99, 100, 107.] The infection rate in class II patients is 28.1% and in class III are 50%. In our study Contaminated & dirty wound were associated with SSI as observed in previous studies[95, 98, 99, 100, 102.] The infection rate in contaminated wound is 91.7% (11/12) while in dirty wound it is 50% (1/2). Duration of surgery > 2 hours duration is significantly associated with SSI. Reports from other studies are in agreement with our findings[95, 96, 97, 98, 100, and 102.] The infection rate is 19.7% (14/71) in patients when the duration of surgery was >2 hours. No patient with surgery duration < 2 hours developed SSI in our study (0/29).

Duration of drain placement for > 4 days is associated with SSI in our study. Similar finding was observed in many studies[96, 97, 98, 99, 102, 106, 107.] The infection rate is 60.9% in patients with drain placed for > 4 days.

The most common disease condition encountered in our study is acute appendicitis with or without abscess & surgical procedure observed is emergency open Appendicectomy. SSI was most commonly observed in appendicular abscess & duodenal perforation. SSI was noted on 4th post operat^{ive} day for 9 patients and 5th post operative day for 5 patients. None of the patients developed SSI after

discharge from hospital. The endogenous flora is responsible for infection in most cases. The opening of the gastrointestinal tract increases the likelihood of Gram-negative bacilli that was our finding in this study. The most common organism isolated was E.coli. It was isolated in 50% of swab culture. This is similar to the finding observed by Amit Agarwal et al & Lul raka et al[96, 100.] Pseudomonas & proteus mirabilis were next most common organisms isolated. More than 1 organism was isolated in the swab culture of 5 patients. E.coli was found sensitive to piperacillin & Tazobactum, Imipenam , Colistin. The other organisms observed in swab culture were klebseilla, staph aureus, MRSA. Swab culture was sterile in 3 patients in our study.

In patients who developed SSI, 13 patients had superficial SSI .1 patient had organ space SSI. None of the patients developed deep incisional SSI. Secondary wound closure was done for 9 (64.3%) patients who had SSI with residual wound dehiscence with healthy granulation tissue in whom spontaneous closure did not occur. All patients with SSI had prolonged post operative stay duration of more than 7 days.

CONCLUSION

Surgical site infection is increasingly recognized as a measure of the quality of patient care by surgeons, infection control practitioners, health planners and public. The incidence of SSI in our environment is still high when compared to the developed world. The SSI rate in our study is 14% and risk factors associated with SSI in our study are smoking (p=0.001), pre operative stay of > 3days (p=0.000), ASA score (p=0.001), contaminated & dirty wound (p=0.000), duration of surgery (p= 0.010) & duration of drain placement (p=0.000).

Our study prompts us to look at the gaps in our surgical and infection control protocols which will enable policy formulation that will foster a reduction in wound infection rate. SSI can be reduced by decreasing the preoperative hospital stay, appropriate antibiotic administration policies, adequate preoperative patient preparation, reducing the duration of surgery to minimum, judicious use of drains and intraoperative maintenance of asepsis and following operation theatre discipline properly.

Although surgical site infections cannot be completely eliminated, a reduction in the infection rate to a minimal level could have significant benefits, by reducing postoperative morbidity and mortality, and wastage of health care resources.

LIMITATIONS

Majority of surgical procedures in our study are of Emergency surgeries .so the incidence of SSI is high in our study. Moreover we were not able to analyse the rate of SSI in Elective surgeries.

We covered only abdominal surgeries. Other cases in surgery department were not included. The scenario can change if other surgical cases are incorporated. This may change the SSI surveillance system & infection control policies.

RECOMMENDATIONS

A dedicated system of infection surveillance has to be established to identify the gaps in our infection control protocols and therefore identify areas of focus to reduce the burden of SSIs. It will also help to individualize policies regarding infection control in different setups.

Appropriate precautionary measure has to be taken to reduce the incidences of SSI that originate primarily from the care procedures provided during hospitalization. A sound antibiotic policy, reduction of length of procedures through adequate training of the staff on proper surgical techniques, proper intra-operative infection control measures and feedback of appropriate data to surgeons regarding SSIs would be desirable to reduce the surgical site infection.

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APPENDIX – I

CERTIFICATE OF APPROVAL

To

Dr.Dhanasekaran.P
Post Graduate in General Surgery,
ESIC Medical College & PGIMSR,
KK Nagar, Chennai-78.

Dear Dr.Dhanasekaran.P

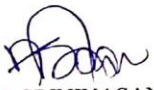
The Institutional Ethics Committee of ESIC Medical College & PGIMSR reviewed and discussed your application for approval of the proposal entitled "**Evaluation of surgical site infection in abdominal surgeries in adults**", No. 02/2018.

The following members of the Ethics Committee were present in the meeting held on 21.03.2018 conducted at ESIC Medical College & PGIMSR, KK Nagar, Chennai-78.

S.No.	ETHICS COMMITTEE MEMBERS
1.	Prof. A.V. Srinivasan, Chairperson
2.	Prof. V. Rajalakshmi, Registrar, ESIC Medical College & PGIMSR, Member Secretary
3.	Prof. Usha Kothandaraman, Medical Superintendent, ESIC Medical College & PGIMSR, EC Member
4.	Prof. S. Seethalakshmi, Vice Principal, ESIC Medical College & PGIMSR, EC Member
5.	Prof. Sowmya Sampath, Prof. & HOD, Department of Paediatrics, ESIC Medical College & PGIMSR, EC Member
6.	Dr. Aruna Patil Bholenath, Assistant Professor of Statistics, Department of Community Medicine, ESIC Medical College & PGIMSR, EC Member
7.	Dr. A. Sundaram, Dept. of Medicine [Diabetologist], EC Member
8.	Dr. O.L. Naganath Babu, Dept. of Surgical Gastroenterology, EC Member
9.	Dr. S. Dhanalakshmi, Dept. of OBG, EC Member
10.	Dr. N. Krishnan, Dept. of Anesthesia, EC Member
11.	Dr. Rajkumar Williams, Dept. of Surgery, EC Member
12.	Prof. C. Rajendiran, Department of General Medicine, EC Member
13.	Dr. Napinai, Clinical Psychologist, EC Member
14.	Dr. C.V. Aravindan, Scientist, EC Member
15	Shri. K M Venugopal, Advocate, EC Member

The proposal is approved to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and significant adverse effects occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.



[DR. A.V. SRINIVASAN]
CHAIRPERSON
ETHICAL COMMITTEE

Appendix II

PROFORMA

NAME: AGE: IPNO.

SEX: MOBILE NO:

COMORBID ILLNESS: DM Yes/No

PERSONAL HABITS: Smoking Yes/No

EXAMINATION:

- Pallor Yes/No
- BMI :

<18.5	18.5-25	>25

- Skin Infection at incision site Yes/No
- Evidence of Remote Infection. Yes/No

DIAGNOSIS:

PRE OPERATIVE PERIOD:

- Stay duration(days):

≤3	>3

- INVESTIGATIONS:

  Glycemic control(RBS)(mg/dl):

<200	≥200

  Haemoglobin(g/dl): Male

<13	≥13

  Female

<12	≥12

Serum Albumin(g/dl):

<3.5	≥3.5

- ASA score:

I	II	III

SURGICAL DETAILS:

- Name of the Surgery:
- Type of procedure: Emergency/Elective
- Type of wound: Clean/ Clean Contaminated/Contaminated/Dirty
- Duration of surgery(hrs):

≤2	>2

- Drain tube placed:

  Yes:

CLOSED	OPEN

  No

POST OPERATIVE PERIOD:

- Duration of stay(days):

<3	3-7	>7

- Glycemic control(RBS)(mg/dl):

<200	≥200

- Time of initiation of oral feed(hrs):

<24	24-48	>48

- No. of days drain placed:

<4	≥4

- Observation of wound during the post operative period

	DAY 2	DAY 7	DAY 14	DAY 21	DAY30	
SURGICAL WOUND						

TYPE OF SSI:

Superficial	Deep	Organ Space

SWAB CULTURE REPORT:

ORGANISM	SENSITIVITY

ANTIBIOTIC USED & DURATION:

ANY SURGICAL INTERVENTION (Details of surgical procedure if done):

OUTCOME:

PATIENTS UNDERGOING ABDOMINAL SURGERIES(n= 100)

HISTORY TAKING	AGE (Yrs)			SEX		DM		SMOKING		CO EXISTENT INFECTION		
	13 - 35	35-65	>65	M	F	Yes	No	Yes	No	Yes	No	
CLINICAL EXAMINATION	BMI			PALLOR		CO EXISTENT INFECTION		C/F OF SYSTEMIC ILLNESS				
	<18.5	18.5 -25	>25	Yes	No	Yes	No	Yes	No			
INVESTIGATIONS	RANDOM BLOOD SUGAR(mg/dl)		HAEMOGLOBIN(g/dl)				SERUM ALBUMIN(gm/dl)					
	<200	≥200	MALE		FEMALE		<3.5					
			<13	≥ 13	<12	≥12	≥3.5					
DIAGNOSIS												
PRE OP DETAILS	DURATION OF PRE OP STAY		GLYCEMIC CONTROL(mg/dl) (RBS)		NAME OF THE PROCEDURE	ASA SCORE						
	≤3 days	>3 days	<200	≥200								
SURGERY DETAILS	TYPE OF PROCEDURE		TYPE OF WOUND				DURATION OF SURGERY		DRAINING TUBE			
	Elective	Emergency	I	II	III	IV	≤2 hrs	>2 hrs	Yes		No	
									OPEN	CSD		
POST OP DETAILS	DURATION OF STAY			GLYCEMIC CONTROL(RBS)(mg/dl)		TEMPERATURE		TIME OF INITIATION OF ORAL FEED(hrs)			NO. OF DAYS DRAIN PLACED	
	<3 days	3-7 days	>7 days	<200	≥200	≤38*C	>38*C	<24	24 - 48	>48	<4	≥4

Appendix III

INFORMED CONSENT

Informed consent for patients who are attending surgical OPD or casualty in ESIC MEDICAL COLLEGE &PGIMSR hospital, and whom we are inviting to participate in the research titled **"Evaluation of surgical site infections in abdominal surgeries"AT ESIC MEDICAL COLLEGE & PGIMSR, KK Nagar, Chennai, 2014-15"**. Dr.Dhanasekaran.P, M.S. (General surgery) post graduate is the principal investigator of this research under ESI-PGIMSR, Chennai.

Part I: Information Sheet

Introduction

We,**Dr.Dhanasekaran. P**, 1st year General Surgery PG, guided by
PROF.Dr. P.N. Shanmugasundaram, M.S., Professor and HOD Of General Surgery, are going to give you information and invite you to be a part of this research. Before you decide, you can talk to anyone of us you feel comfortable with about the research. This consent form may contain words that you do not understand. Please ask us to stop as we go through the information and we will take time to explain. If you have questions later, you can ask us.

Purpose of the research

We will treat you by performing appropriate surgery for your disease. You will be called for scheduled follow up after discharge. All the details will be recorded in a proforma sheet and will be used to find out the cause for infection at the surgery site.

Type of Research

This research will involve your participation in a non-experimental manner, with assured privacy and confidentiality.

Right to Refuse or Withdraw

Your participation is strictly voluntary. Refusal to participate will not affect subsequent services to you

Confidentiality

All information you provide will be kept confidential. Your name will not be used in any way.

Whom to Contact

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact: Dr.P.Dhanasekaran

This proposal has been reviewed and approved by Institute Ethical Committee, which is a committee whose task is to make sure that research participants are protected from any harm. If you have any questions regarding any part of the study, feel free to ask.

Part II: CERTIFICATE OF CONSENT

I have read the information in the consent form (or it has been read to me.) I was free to ask any questions and they have been answered. I understand what is being requested of me as a participant in this study. I have been given satisfactory answers to my questions. I freely consent to participate in the study called "Evaluation of surgical site infections in abdominal surgeries in adults" AT ESIC MEDICAL COLLEGE &PGIMSR, K.K.Nagar, Chennai, 2018 -19".

I have read and understood this consent form and the information provided to me.

I have been explained about the nature of the study.

My rights and responsibilities have been explained by the investigator

I agree to cooperate with the investigator.

Currently I am not participating in any research study.

I hereby give permission to the investigators to release the information obtained from me as a result of participation in the study to the regulatory authorities, government agency and ethical committee. I understand that they may inspect my original records.

My records will be kept confidential

I have decided to participate in the study.

As I was not able to read, the consent form has been read out to me by the investigator and all my questions have been answered and I give my consent with my free will.

_____

Name of Participant

_____ _____

Sign of Participant Name of Investigator (Signed) Date

மருத்துவர் தனசேகரன் தனது முதுநிலை அறுவைசிகிச்சை பட்டப்படிப்பு முழுமைபெறுவதற்காக மேற்கொள்ளும் அறுவை சிகிச்சை தளம் தொற்று நோய் ஆய்வினைப்பற்றி எனக்கு என் தாய்மொழியில் விளக்கப்பட்டது.

இந்த ஆய்வின் அனைத்து அம்சங்களும் விளக்கப்பட்டது. இதில் நான் என் முழு விருப்பத்துடன் கலந்து கொள்கிறேன். எனினும் எந்த நேரத்திலும், எந்த காரணமுமின்றி இந்த ஆய்விலிருந்து விலகிக்கொள்ள எனக்கு முழு உரிமையுள்ளது. இதனால் எனது நலனில் எந்த பாதிப்பும் ஏற்படாது என்று உறுதியளிக்கப்படுகிறது. இந்த ஆய்வின் அறிக்கையில் என்னுடைய தனிப்பட்ட விவரங்கள் அனைத்தும் ரகசியமாய் பாதுகாக்கப்படும் என்று எனக்கு உறுதியளிக்கப்பட்டிருக்கிறது. மேற்கூறிய உறுதிமொழிகள் யாவும் பின்பற்றப்படும் பட்சத்தில் நான் இந்த ஆய்வுக்கட்டுரைக்கு என்னுடைய விவரங்களை அளிக்க முன்வருகிறேன். இதற்கு முழுமனதுடன் என்னுடைய ஒப்புதலை தந்து இந்த ஆய்வறிக்கையில் பங்கேற்கிறேன்.

இப்படிக்கு,

(கையொப்பம்)

Appendix IV

PLAGIARISM

URKUND

Urkund Analysis Result

Analysed Document:	THESIS full document.docx (D57423496)
Submitted:	22/10/2019 10:45:00
Submitted By:	dhans.dr@gmail.com
Significance:	19 %

Sources included in the report:

Clinical Study of Causative Factors Precautionarymeasures and the treatment of surgical site infections.pdf (D30976211)
2. Review of Literature (2).docx (D22388752)
thesis for plaigarism prakash.docx (D56235635)
thesis.docx (D30928086)
plag jc.docx (D42750121)
thesis SSI.....docx (D55636216)
thesis 1.docx (D31125777)
Review of Literature Dr Sankalp Goel General Surgery.docx (D56167250)
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6101509/
https://www.ncbi.nlm.nih.gov/books/NBK536430/
https://www.woundsource.com/blog/surgical-site-infections-current-recommendations-and-guidelines
https://www.govinfo.gov/content/pkg/FR-1998-06-17/html/98-15551.htm
https://www.researchgate.net/publication/41174935_Reducing_Surgical_Site_Infections_A_Review
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5266862/
https://www.researchgate.net/publication/11857466_Surgical_Site_Infection_SSI_Rates_in_the_United_States_1992-1998_The_National_Nosocomial_Infections_Surveillance_System_Basic_SSI_Risk_Index
https://www.aaos.org/uploadedFiles/PreProduction/Quality/Guidelines_and_Reviews/ssi-sr-09132018.pdf
https://ijsurgery.com/index.php/isj/article/download/2290/1675
https://ijsurgery.com/index.php/isj/article/download/679/677
https://pssjournal.biomedcentral.com/articles/10.1186/s13037-019-0190-8
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3275863/
https://www.researchgate.net/publication/12719920_The_impact_of_surgical-site_infections_in_the_1990s_Attributable_mortality_excess_length_of_hospitalization_and_extra_costs
https://www.researchgate.net/publication/7439846_Standardized_incidence_rates_of_surgical_site_infection_A_multicenter_study_in_Thailand

URKUND

28cab8ff-4822-4d23-81cd-4011a1a7cade
https://www.researchgate.net/publication/285367806_Surgical_Site_Infections_Incidence_and_Risk_Factors_in_a_Tertiary_Care_Hospital_Western_India
https://aricjournal.biomedcentral.com/articles/10.1186/2047-2994-3-25

Instances where selected sources appear:

61

Appendix V

AMERICAN SOCIETY OF ANAESTHESIOLOGIST(ASA) PHYSICAL STATUS CLASSIFICATION SYSTEM

ASA PS Classification	Definition	Examples, including, but not limited to:
ASA I	A normal healthy patient	Healthy, non-smoking, no or minimal alcohol use
ASA II	A patient with mild systemic disease	Mild diseases only without substantive functional limitations. Examples include (but not limited to): current smoker, social alcohol drinker, pregnancy, obesity (30 < BMI < 40), well-controlled DM/HTN, mild lung disease
ASA III	A patient with severe systemic disease	Substantive functional limitations; One or more moderate to severe diseases. Examples include (but not limited to): poorly controlled DM or HTN, COPD, morbid obesity (BMI ≥40), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction, ESRD undergoing regularly scheduled dialysis, premature infant PCA < 60 weeks, history (>3 months) of MI, CVA, TIA, or CAD/stents.
ASA IV	A patient with severe systemic disease that is a constant threat to life	Examples include (but not limited to): recent (< 3 months) MI, CVA, TIA, or CAD/stents, ongoing cardiac ischemia or severe valve dysfunction, severe reduction of ejection fraction, sepsis, DIC, ARD or ESRD not undergoing regularly scheduled dialysis
ASA V	A moribund patient who is not expected to survive without the operation	Examples include (but not limited to): ruptured abdominal/thoracic aneurysm, massive trauma, intracranial bleed with mass effect, ischemic bowel in the face of significant cardiac pathology or multiple organ/system dysfunction
ASA VI	A declared brain-dead patient whose organs are being removed for donor purposes	

Appendix VI

Master Chart

	History Taking						Clinical Examination				Investigation			
No.	**Name**	**Age**	**Sex**	**DM**	**Smoking**	**CoExistent Infection**	**BMI**	**Pallor**	**CoExistent Infection**	**C/F of Systemic Illness**	**Random Bloos Sugar**	**Hb_Male**	**Hb_Female**	**Albumin**
1	ANANDHI	1	2	2	2	2	2	2	2	2	1		1	1
2	DHANDAPANI	1	1	2	2	2	1	2	2	2	1	1		1
3	SRIHARI	1	1	2	2	2	2	2	2	2	1	1		2
4	DHAMODHARAN	1	1	2	2	2	2	2	2	2	1	1		2
5	AIYAPPAN	2	1	2	2	2	2	1	2	2	1	1		1
6	MURALI	1	1	2	2	2	2	2	2	2	1	1		2
7	RAABATHAN	3	1	1	1	2	2	2	2	2	1	1		2
8	BHUVANESHWARI	1	2	2	2	2	2	2	2	2	1		1	2
9	VIAYASELVI	2	2	2	2	2	2	2	2	2	1		1	2
10	KURSIDA ALAM	1	1	2	2	2	2	2	2	2	1	2		2
11	MAHALAKSHMI	1	2	2	2	2	2	2	2	2	1		1	1
12	KULANDAIVEL	2	1	2	2	2	2	2	2	2	1	2		2
13	SURYAMANI	1	1	2	2	2	2	2	2	2	1	2		2
14	RAVI	1	1	2	2	2	2	1	2	2	1	1		2
15	MAHESHWARI	1	2	2	2	2	2	1	2	2	1		2	2
16	GAJALAKSHMI	2	2	2	2	2	2	2	2	2	1		2	2
17	JAYARAMAN	2	1	2	1	2	2	1	2	2	1	1		1
18	ELUMALAI	2	1	2	1	2	2	2	2	2	1	2		2
19	SARASWATHI	2	2	1	2	2	2	2	2	2	1		2	2
20	NAGARAJAN	1	1	2	2	2	2	2	2	2	1	2		2
21	MALAR	2	2	2	2	2	2	2	2	2	1		1	1
22	HABIBUR RAHAMAN	1	1	2	2	2	2	2	2	2	1	1		2
23	CHITARANJAN	2	1	2	1	2	2	1	2	2	1	1		1
24	SEKAR	2	1	1	2	2	2	2	2	1	2	2		1
25	PRAKASHRAJ	1	1	2	2	2	2	2	2	2	1	2		2
26	SELVI	2	2	2	2	2	2	2	2	2	1		1	2
27	SEKAR	2	1	2	2	2	2	1	2	2	1	1		2

	History Taking						Clinical Examination				Investigation			
No.	**Name**	**Age**	**Sex**	**DM**	**Smoking**	**CoExistent Infection**	**BMI**	**Pallor**	**CoExistent Infection**	**C/F of Systemic Illness**	**Random Bloos Sugar**	**Hb_Male**	**Hb_Female**	**Albumin**
28	RADHA	2	2	2	2	2	2	1	2	2	1		1	2
29	AZHAGU MEENA	2	2	1	2	2	2	2	2	2	2		2	2
30	LATHA	2	2	2	2	2	2	1	2	2	1		1	1
31	PRAVEEN	1	1	2	2	2	2	2	2	2	1	2		2
32	VISALATCHI	2	2	2	2	2	2	1	2	2	1		1	1
33	RAMAN	1	1	2	2	2	2	2	2	2	1	2		2
34	MANIKANDAN	1	1	2	2	2	2	2	2	2	1	2		2
35	SRINIVASAN	2	1	2	2	2	2	2	2	2	1	2		2
36	VALARMATHI	2	2	2	2	2	1	1	2	2	1		1	2
37	ETTIYAPPAN	1	1	2	2	2	2	2	2	2	1	2		2
38	MUFEES AHAMED	1	1	2	2	2	1	2	2	2	1	1		1
39	SATHYAVANI	2	2	2	2	2	2	1	2	2	1		1	1
40	ABINAYA	1	2	2	2	2	1	1	2	2	1		1	1
41	INDIRANI	3	2	1	2	2	3	1	2	2	2		1	1
42	LATHA	1	2	2	2	2	2	1	2	2	1		1	1
43	SARAN	1	1	2	2	2	1	2	2	2	1	2		2
44	ROSY	2	2	2	2	2	2	1	2	2	1		1	2
45	murali	2	2	2	2	2	2	1	2	2	1	2		2
46	SRINIVASAN	1	1	2	2	2	1	2	2	2	1	2		2
47	RAMESH	2	1	2	2	2	2	2	2	2	1	1		2
48	NANCY MARY	1	2	2	2	2	2	2	2	2	1		2	2
49	RAJESH	2	1	1	2	2	2	2	2	2	1	1		2
50	SIVASHANKAR	1	1	2	2	2	1	1	2	2	1	1		1
51	KAMATCHI	2	2	2	2	2	2	1	2	2	1		1	1
52	GUNASEKARAN	2	1	2	2	2	2	2	2	2	1	2		2
53	CHINNADURAI	2	1	2	1	2	2	2	2	2	1	1		2
54	VAMSI KRISHNAN	1	1	2	2	2	1	2	2	2	1	2		1
55	SAROJA	2	2	2	2	2	2	1	2	2	1		1	1
56	VARALAKSHMI	1	2	2	2	2	1	2	2	2	1		1	1
57	MALATHY	2	2	2	2	2	2	2	2	2	1		2	2
58	RAVISHANKAR	2	1	2	1	2	2	2	2	2	1	2		2
59	BAVITHA DEVI	1	2	2	2	2	2	1	2	2	1		1	1
60	KAVITHA	1	2	2	2	2	2	2	2	2	1		2	1
61	KANNIYAMMAL	2	2	2	2	2	2	1	2	2	1		1	1

	History Taking						Clinical Examination				Investigation			
No.	**Name**	**Age**	**Sex**	**DM**	**Smoking**	**CoExistent Infection**	**BMI**	**Pallor**	**CoExistent Infection**	**C/F of Systemic Illness**	**Random Bloos Sugar**	**Hb_Male**	**Hb_Female**	**Albumin**
62	ANAND	1	1	2	2	2	2	2	2	2	1	1		2
63	KANNIKA	2	2	2	2	2	2	1	2	2	1		1	1
64	SELVARANI	2	2	1	2	2	2	2	2	2	1		1	2
65	DHANDAPANI	1	1	2	2	2	2	2	2	2	1	1		1
66	SAVITHA	2	2	1	2	2	2	2	2	2	1		2	2
67	VIJAYA	2	2	2	2	2	2	1	2	2	1		1	1
68	RAJA	3	1	1	2	2	2	2	2	2	1	1		2
69	ALLAUDHIN	2	1	2	1	2	2	2	2	2	1	2		2
70	DEVAKI	2	2	2	2	2	2	2	2	2	1		1	1
71	MOORTHY	1	1	2	2	2	2	2	2	2	1	2		2
72	BHUVANA	1	2	2	2	2	2	2	2	2	1		2	2
73	IYAPPAN	2	1	2	2	2	2	1	2	2	1	1		1
74	SELVI	2	2	2	2	2	2	2	2	2	1		2	2
75	SUNDARAM	3	1	2	1	2	1	1	2	2	1	1		1
76	SAVITHRI	1	2	2	2	2	2	2	2	2	1		1	2
77	GANESH	1	1	2	2	2	2	2	2	2	1	2		2
78	DHARMARAJ	1	1	2	1	2	2	2	2	2	1	2		2
79	HARI	1	1	2	2	2	2	2	2	2	1	1		2
80	MAHESWARI	2	2	2	2	2	2	1	2	2	1		1	1
81	PALANIKUMAR	2	1	2	2	2	2	2	2	2	1	2		2
82	SHANKAR	2	1	1	1	2	2	1	2	2	1	1		1
83	RAMYA	1	2	2	2	2	2	2	2	2	1		2	2
84	ELANGOVAN	2	1	2	1	2	2	1	2	2	1	1		1
85	MURUGAN	2	1	2	1	2	2	2	2	2	1	2		2
86	SASIKALA	1	2	2	2	2	2	1	2	2	1		1	1
87	SUNDARAM	2	1	1	2	2	2	2	2	2	1	2		2
88	JAGADEESAN	1	1	2	2	2	1	1	2	2	1	1		1
89	SUMITHA	1	2	2	2	2	2	2	2	2	1		2	2
90	KARUPPIAH	2	1	1	2	2	2	2	2	2	1	2		2
91	KANDASAMY	2	1	2	1	2	2	2	2	2	1	2		2
92	KARTHIK	1	1	2	2	2	2	2	2	2	1	2		2
93	NIRMALA	2	2	2	2	2	2	1	2	2	1		1	1
94	SANGEETH	1	1	2	2	2	2	2	2	2	1	2		2
95	SENTHIL	2	1	2	1	2	2	2	2	2	1	2		2

	History Taking						Clinical Examination				Investigation			
No.	Name	Age	Sex	DM	Smoking	CoExistent Infection	BMI	Pallor	CoExistent Infection	C/F of Systemic Illness	Random Bloos Sugar	Hb_Male	Hb_Female	Albumin
96	MANIKANDAN	1	1	2	2	2	2	2	2	2	1	2		2
97	KISHORE	1	1	2	2	2	2	2	2	2	1	1		2
98	DEVI	1	2	2	2	2	2	1	2	2	1		1	2
99	DHANAPAL	1	1	2	2	2	2	2	2	2	1	2		2
100	shanthi	2	2	2	2	2	2	2	2	2	1		2	2

No.	Diagnosis	Pre OP Details				Surgery Details			
		Stay Duration	Glycemic Ctrl	Procedure Name	ASA Score	Procedure Type	Wound Type	Surgery Duration	Draining Tube
1	Appendicular abscess	1	1	Emergency Open Appendicectomy With Peritoneal Lavage	1	2	4	2	1
2	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
3	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
4	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
5	Post rectal perforation covering ileostomy	1	1	Ileostomy Closure	2	1	2	2	1
6	Appendicular abscess	1	1	Em. Open Appendicectomy	1	2	4	2	1
7	Acute on chronic appendicitis	1	1	Open Appendicectomy	2	1	2	2	1
8	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
9	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
10	Cholelithiasis	1	1	Open Cholecystectomy	1	1	2	2	1
11	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
12	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
13	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
14	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
15	Acute appendicitis & meckel's diverticulum	1	1	Em. Open Appendicectomy & Resection Anastamosis Of Ileum	1	2	2	2	1
16	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
17	Carcinoma rectum/post neoad.chemotherapy/radiotherapy	2	1	Abd.Perineal Resection With End Colostomy	3	1	3	2	1
18	Stitch granuloma with multiple sinus	1	1	Laparotomy & Sinus Exploration	2	1	2	2	1
19	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
20	Appendicular abscess	1	1	Em. Open Appendicectomy	1	2	3	2	1
21	Carcinoma hypopharynx	2	1	Feeding Jejunostomy	3	1	2	2	2
22	Appendicular abscess /intraabdominal sepsis	1	1	Laparotomy	2	2	2	2	1
23	Carcinoma esophagus with carcinoma pyriform	1	1	Feeding Jejunostomy	2	1	2	1	2

No.	Diagnosis	Pre OP Details				Surgery Details			
		Stay Duration	Glycemic Ctrl	Procedure Name	ASA Score	Procedure Type	Wound Type	Surgery Duration	Draining Tube
	fossa								
24	Duodenal perforation	1	2	Laparotomy	3	2	2	2	1
25	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
26	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
27	Carcinoma stomach	1	1	Partial Gastrectomy With Agj & Jj	2	1	2	2	1
28	Strangulated inguinal hernia	1	1	Laparotomy With Resection Anastamosis	1	2	2	2	1
29	Acute appendicitis	1	2	Em. Open Appendicectomy	2	2	2	2	1
30	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
31	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
32	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
33	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
34	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
35	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
36	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
37	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
38	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
39	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
40	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
41	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
42	Subacute appendicitis	1	1	Lap Appendicectomy	1	1	2	1	2
43	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
44	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
45	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
46	Duodenal perforation	1	1	Em. Laporotomy With Graham's Omental Patch Repair	2	2	3	2	1
47	Irreducible umbilical hernia	1	1	Anatomical Repair	2	2	2	2	1
48	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
49	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
50	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
51	Subacute intestinal obstruction	1	1	Em. Laporotomy & Adhesionolysis	2	2	2	2	1
52	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
53	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
54	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
55	Duodenal perforation	1	1	Em. Laparotomy & Graham's Omental Patch Repair	2	2	3	2	1
56	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
57	Calculous cholecystitis	1	1	Lap. Cholecystectomy	1	1	2	2	2

No.	Diagnosis	Pre OP Details				Surgery Details			
		Stay Duration	Glycemic Ctrl	Procedure Name	ASA Score	Procedure Type	Wound Type	Surgery Duration	Draining Tube
58	Duodenal perforation	1	1	Em.Laporotomy & Graham's Omental Patch Repair	2	2	3	2	1
59	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
60	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
61	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
62	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
63	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
64	Adhesive intestinal obstruction	1	1	Em.Laparotomy And Adhesinolysis	2	2	2	2	1
65	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
66	Duodenal perforation	1	1	Exploratory Laparotomy & Graham's Omental Patch Repair	2	2	3	2	1
67	Adhesive intestinal obstruction	1	1	Emergency Laparotomy And Adhesinolysis	2	2	2	2	1
68	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
69	Cholelithiasis	1	1	Opencholecystectomy	1	1	2	2	2
70	Appendicular abscess	1	1	Em. Open Appendicectomy	1	2	3	2	1
71	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
72	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
73	Acute appendicitis	1	1	Em. Open Appendicectomy	2	2	2	2	2
74	Abdominal wall lipoma	1	1	Excision Biopsy	1	1	1	1	2
75	Carcinoma stomach	2	1	Laparotomy,Subtotal Gastrectomy Agj,Jj	2	1	2	2	1
76	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
77	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
78	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
79	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
80	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
81	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
82	Ileal perforation	1	1	Emergency Laparotomy & Ileal Resection And Anastamosis	2	2	3	2	1
83	Post lscs sinus tract	1	1	Sinus Tract Excision With Flap Cover	1	1	2	2	1
84	Carcinoma stomach	2	1	Laparotomy,Subtotal Gastrectomy Agj,Jj	3	1	3	2	1
85	Irreducible paraumbilical hernia	1	1	Emergency Anatomical Repair With Omentectomy	2	2	2	2	1
86	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
87	Chronic appendicitis	1	1	Lap Appendicectomy	2	1	2	2	2
88	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2

No.	Diagnosis	Pre OP Details				Surgery Details			
		Stay Duration	Glycemic Ctrl	Procedure Name	ASA Score	Procedure Type	Wound Type	Surgery Duration	Draining Tube
89	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
90	Cholelithiasis and choledocholithiasis	2	1	Open Cholecystectomy With Cbd Exploration	2	1	3	2	1
91	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
92	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
93	Duodenal perforation	1	1	Exploratory Laparotomy & Graham's Omental Patch Repair	2	2	3	2	1
94	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
95	Ileal perforation	1	1	Emergency Laparotomy With Ileal Resection And Anastamosis	2	2	3	2	1
96	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
97	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
98	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	2	2
99	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2
100	Acute appendicitis	1	1	Em. Open Appendicectomy	1	2	2	1	2

No.	Post OP Details							
	Stay Duration	Glycemic Control	Temp	Time of Initiation of Oral Feed	No. of Days Drain Placed	Surgical Would_2	Surgical Would_7	Surgical Would_14
1	3	1	1	3	2	Healthy	Purulent Discharge & Wound Gaping Present	Healed
2	2	1	1	2		Healthy	Healthy	Healthy
3	2	1	1	2		Healthy	Healthy	Healthy
4	2	1	1	2		Healthy	Healthy	Healthy
5	3	1	1	3	2	Healthy	Healthy	Healthy
6	3	1	1	2	2	Healthy	Healthy	Healthy
7	2	1	1	2	1	Healthy	Healthy	Healthy
8	2	1	1	2		Healthy	Healthy	Healthy
9	2	1	1	2		Healthy	Healthy	Healthy
10	2	1	1	2	1	Healthy	Healthy	Healthy
11	2	1	1	2		Healthy	Healthy	Healthy
12	2	1	1	2		Healthy	Healthy	Healthy
13	2	1	1	2		Healthy	Healthy	Healthy
14	2	1	1	2		Healthy	Healthy	Healthy
15	3	1	1	3	2	Healthy	Healthy	Healthy
16	2	1	1	2		Healthy	Healthy	Healthy

No.	Post OP Details							
	Stay Duration	Glycemic Control	Temp	Time of Initiation of Oral Feed	No. of Days Drain Placed	Surgical Would_2	Surgical Would_7	Surgical Would_14
17	3	1	1	3	2	Healthy	Serous Discharge Present	Healthy
18	2	1	1	1	1	Healthy	Healthy	Healthy
19	2	1	1	2		Healthy	Healthy	Healthy
20	3	1	1	3	2	Healthy	Serous Discharge Present	Healthy
21	3	1	1	3		Healthy	Healthy	Healthy
22	3	1	1	3	2	Healthy	Serous Discharge Present	Healing With Wound Gaping
23	2	1	1	3		Healthy	Healthy	Healthy
24	3	1	1	3	2	Healthy	Healthy	Healthy
25	2	1	1	2		Healthy	Healthy	Healthy
26	2	1	1	2		Healthy	Healthy	Healthy
27	3	1	1	3	2	Healthy	Healthy	Healthy
28	3	1	1	3	2	Healthy	Healthy	Healthy
29	2	1	1	3	1	Healthy	Healthy	Healthy
30	2	1	1	2		Healthy	Healthy	Healthy
31	2	1	1	2		Healthy	Healthy	Healthy
32	2	1	1	2		Healthy	Healthy	Healthy
33	2	1	1	2		Healthy	Healthy	Healthy
34	2	1	1	2		Healthy	Healthy	Healthy
35	2	1	1	2		Healthy	Healthy	Healthy
36	2	1	1	2		Healthy	Healthy	Healthy
37	2	1	1	2		Healthy	Healthy	Healthy
38	2	1	1	2		Healthy	Healthy	Healthy
39	2	1	1	2		Healthy	Healthy	Healthy
40	2	1	1	2		Healthy	Healthy	Healthy
41	2	1	1	2		Healthy	Healthy	Healthy
42	2	1	1	2		Healthy	Healthy	Healthy
43	2	1	1	2		Healthy	Healthy	Healthy
44	2	1	1	2		Healthy	Healthy	Healthy
45	2	1	1	2		Healthy	Healthy	Healthy
46	3	1	1	3	2	Healthy	Serous Discharge Present	Healing
47	2	1	1	3	2	Healthy	Healthy	Healthy
48	2	1	1	2		Healthy	Healthy	Healthy
49	2	1	1	2		Healthy	Healthy	Healthy
50	2	1	1	2		Healthy	Healthy	Healthy
51	3	1	1	3	2	Healthy	Healthy	Healthy
52	2	1	1	2		Healthy	Healthy	Healthy
53	2	1	1	2		Healthy	Healthy	Healthy
54	2	1	1	2		Healthy	Healthy	Healthy

No.	Post OP Details							
	Stay Duration	Glycemic Control	Temp	Time of Initiation of Oral Feed	No. of Days Drain Placed	Surgical Would_2	Surgical Would_7	Surgical Would_14
55	3	1	1	3	2	Healthy	Healthy	Healthy
56	2	1	1	2		Healthy	Healthy	Healthy
57	2	1	1	2		Healthy	Healthy	Healthy
58	3	1	1	3	2	Healthy	Serous Discharge & Wound Gaping Present	Healed By Secondary Intention
59	2	1	1	2		Healthy	Healthy	Healthy
60	2	1	1	1		Healthy	Healthy	Healthy
61	2	1	1	2		Healthy	Healthy	Healthy
62	2	1	1	2		Healthy	Healthy	Healthy
63	2	1	1	2		Healthy	Healthy	Healthy
64	2	1	1	2	1	Healthy	Healthy	Healthy
65	1	1	1	1		Healthy	Healthy	Healthy
66	3	1	2	3	2	Healthy	Discharge	Wound Gaping
67	2	1	1	2	1	Healthy	Healthy	Healthy
68	2	1	1	2		Healthy	Healthy	Healthy
69	2	1	1	2		Healthy	Healthy	Healthy
70	3	1	2	3	2	Healthy	Pelvic Abcess ,Wound Gaping	Wound Gaping
71	2	1	1	2		Healthy	Healthy	Healthy
72	2	1	1	2		Healthy	Healthy	Healthy
73	2	1	1	2		Healthy	Healthy	Healthy
74	1	1	1	1		Healthy	Healthy	Healthy
75	3	1	1	3	2	Healthy	Wound Gaping	Sec.Suturing Done
76	2	1	1	2		Healthy	Healthy	Healthy
77	2	1	1	2		Healthy	Healthy	Healthy
78	2	1	1	2		Healthy	Healthy	Healthy
79	2	1	1	2		Healthy	Healthy	Healthy
80	2	1	1	2		Healthy	Healthy	Healthy
81	2	1	1	2		Healthy	Healthy	Healthy
82	3	1	1	3	2	Healthy	Wound Gaping	Sec Suturing Done Onpod 11,Healthy
83	2	1	1	2	1	Healthy	Healthy	Healthy
84	3	1	1	3	2	Seroma	Wound Gaping	Healthy
85	2	1	1	2	1	Healthy	Healthy	Healthy
86	2	1	1	2		Healthy	Healthy	Healthy
87	1	1	1	2		Healthy	Healthy	Healthy
88	2	1	1	2		Healthy	Healthy	Healthy
89	2	1	1	2		Healthy	Healthy	Healthy
90	3	1	2	3	2	Healthy	Pus Discharge	Sec Suturing Done Onpod 11,Healthy
91	2	1	1	2		Healthy	Healthy	Healthy
92	2	1	1	2		Healthy	Healthy	Healthy

No.	Post OP Details							
	Stay Duration	Glycemic Control	Temp	Time of Initiation of Oral Feed	No. of Days Drain Placed	Surgical Would_2	Surgical Would_7	Surgical Would_14
93	3	1	2	3	2	Healthy	Seroma,Wound Gaping	Sec Suturing Done Onpod 14,Healthy
94	2	1	1	2		Healthy	Healthy	Healthy
95	3	1	2	3	2	Healthy	Pus Discharge,Wound Gaping	Granulating Well
96	2	1	1	2		Healthy	Healthy	Healthy
97	2	1	1	2		Healthy	Healthy	Healthy
98	2	1	1	2		Healthy	Healthy	Healthy
99	2	1	1	2		Healthy	Healthy	Healthy
100	2	1	1	2		Healthy	Healthy	Healthy

No.	Post OP Details				SSI			
	Surgical Would_21	Surgical Would_30	Name of Antibiotic	Duration of Antibiotic	Type of SSI	SWAB Culture Report_Organism	SWAB Culture Report_Sensitivity	Surgical Intervention
1	Healthy	Healthy	Amoxyclav,Metro,Piptaz	5	1	E.Coli	Piptaz, Meropenam ,Colistin	Nil
2	Healthy	Healthy	Cefotaxim,Metro	3				NIL
3	Healthy	Healthy	Cefotaxim,Metro	3				NIL
4	Healthy	Healthy	Cefotaxim,Metro	3				NIL
5	Healthy	Healthy	Amikacin	7				NIL
6	Healthy	Healthy	Amikacin,Augmentin,Metro	5				NIL
7	Healthy	Healthy	Cefotaxim,Metro	3				NIL
8	Healthy	Healthy	Cefotaxim,Metro	3				NIL
9	Healthy	Healthy	Cefotaxim,Metro	3				NIL
10	Healthy	Healthy	Cefotaxim,Metro	5				NIL
11	Healthy	Healthy	Cefotaxim,Metro	3				NIL
12	Healthy	Healthy	Cefotaxim,Metro	3				NIL
13	Healthy	Healthy	Cefotaxim,Metro	3				NIL
14	Healthy	Healthy	Cefotaxim,Metro	3				NIL
15	Healthy	Healthy	Cefotaxim,Metro	5				NIL
16	Healthy	Healthy	Cefotaxim,Metro	5				NIL
17	Healthy	Healthy	Cefotaxim,Metro &Piptaz	7	1			NIL
18	Healthy	Healthy	Cefotaxim	5				NIL
19	Healthy	Healthy	Cefotaxim,Metro	5				NIL
20	Healthy	Healthy	Cefotaxim,Metro & Amikacin	7	1			NIL
21	Healthy	Healthy	Cefotaxim,Metro	5				NIL
22	Healthy	Healthy	Meropenam,Metro,Colistin	5	1			SECONDARY

No.	Post OP Details				SSI			
	Surgical Would_21	**Surgical Would_30**	**Name of Antibiotic**	**Duration of Antibiotic**	Type of SSI	SWAB Culture Report_Organism	SWAB Culture Report_Sensitivity	Surgical Intervention
								SUTURING
23	Healthy	Healthy	Cefotaxim,Metro	5				NIL
24	Healthy	Healthy	Piptaz ,Metro	8				NIL
25	Healthy	Healthy	Cefotaxim	5				NIL
26	Healthy	Healthy	Cefotaxim,Metro	5				NIL
27	Healthy	Healthy	Amoxyclav,Metro, Cefaperazone	7				NIL
28	Healthy	Healthy	Piptaz ,Metro	7				NIL
29	Healthy	Healthy	Cefotaxim,Metro	5				NIL
30	Healthy	Healthy	Cefotaxim,Metro	5				NIL
31	Healthy	Healthy	Cefotaxim,Metro	3				NIL
32	Healthy	Healthy	Cefotaxim,Metro	4				NIL
33	Healthy	Healthy	Cefotaxim,Metro	5				NIL
34	Healthy	Healthy	Cefotaxim,Metro	3				NIL
35	Healthy	Healthy	Cefotaxim,Metro	5				NIL
36	Healthy	Healthy	Cefotaxim,Metro	4				NIL
37	Healthy	Healthy	Cefotaxim,Metro	3				NIL
38	Healthy	Healthy	Cefotaxim,Metro	3				NIL
39	Healthy	Healthy	Cefotaxim,Metro	4				NIL
40	Healthy	Healthy	Cefotaxim,Metro	3				NIL
41	Healthy	Healthy	Piptaz ,Metro	5				NIL
42	Healthy	Healthy	Cefotaxim,Metro	3				NIL
43	Healthy	Healthy	Cefotaxim,Metro	3				NIL
44	Healthy	Healthy	Cefotaxim,Metro	3				NIL
45	Healthy	Healthy	Cefotaxim,Metro	3				
46	Healthy	Healthy	Piptaz, Metro,Amoxiclav	7	1			NIL
47	Healthy	Healthy	Cefotaxim,Metro	7				NIL
48	Healthy	Healthy	Cefotaxim,Metro	3				
49	Healthy	Healthy	Cefotaxim,Metro	5				
50	Healthy	Healthy	Cefotaxim,Metro	5				
51	Healthy	Healthy	Piptaz, Metro	7				
52	Healthy	Healthy	Cefotaxim,Metro	5				
53	Healthy	Healthy	Amoxyclav,Metro	4				
54	Healthy	Healthy	Cefotaxim,Metro	3				
55	Healthy	Healthy	Cefaperazone Sulbactum , Metro	7				
56	Healthy	Healthy	Cefotaxim,Metro	3				
57	Healthy	Healthy	Cefotaxim,Metro	3				
58	Healthy	Healthy	Piptaz,Metro,Genta	6	1	Klebseilla	Piptaz,Cipro,Amikacin, Genta	

No.	Post OP Details				SSI			
	Surgical Would_21	**Surgical Would_30**	**Name of Antibiotic**	**Duration of Antibiotic**	Type of SSI	SWAB Culture Report_Organism	SWAB Culture Report_Sensitivity	Surgical Intervention
59	Healthy	Healthy	Cefotaxim,Metro	4				
60	Healthy	Healthy	Cefotaxim,Metro	3				
61	Healthy	Healthy	Cefotaxim,Metro	3				
62	Healthy	Healthy	Amoxyclav	3				
63	Healthy	Healthy	Cefotaxim,Metro	3				
64	Healthy	Healthy	Piptaz,Metro	5				
65	Healthy	Healthy	Cefotaxim,Metro	2				
66	Healthy	Healthy	Cefperazone Sulbactum,Colistin,Metro	5	1	E.Coli,Mrsa	Colistin	Sec.Suturing Done On Od15
67	Healthy	Healthy	Piptaz,Metro	4				
68	Healthy	Healthy	Cefotaxim,Metro	3				
69	Healthy	Healthy	Amoxiclav,Metro	3				
70	Sec.Suturing Done	Healthy	Piptaz,Imepenam,Metro	5	3	E.Coli,Pseudomonas	Imipenam	Sec Suturing Done
71	Healthy	Healthy	Cefotaxime,Metro	3				
72	Healthy	Healthy	Cefotaxime,Metro	3				
73	Healthy	Healthy	Cefotaxime,Metro	3				
74	Healthy	Healthy	Amoxiclav	2				
75	Healthy	Healthy	Piptaz,Metro	10	1	E.Coli	Piptaz	Sec Suturing Done On Pod 14
76	Healthy	Healthy	Cefotaxime,Metro	3				
77	Healthy	Healthy	Cefotaxime,Metro	3				
78	Healthy	Healthy	Cefotaxime,Metro	3				
79	Healthy	Healthy	Cefotaxime,Metro	3				
80	Healthy	Healthy	Cefotaxime,Metro	3				
81	Healthy	Healthy	Cefotaxime,Metro	3				
82	Healthy	Healthy	Piptaz,Colistin,Metro	7	1	E.Coli,Pseudomonas	Colistin	Sec Suturing Done On Pod 11
83	Healthy	Healthy	Cefotaxime	5				
84	Healthy	Healthy	Ceftriaxazone,Metro,Piptaz	7	1	E.Coli	Piptaz	Sec Suturing Done On Pod 9
85	Healthy	Healthy	Cefotaxime	5				
86	Healthy	Healthy	Cefotaxime,Metro	3				
87	Healthy	Healthy	Cefotaxime,Metro	2				
88	Healthy	Healthy	Cefotaxime,Metro	3				
89	Healthy	Healthy	Cefotaxime,Metro	3				

No.	Post OP Details				SSI			
	Surgical Would_21	**Surgical Would_30**	**Name of Antibiotic**	**Duration of Antibiotic**	Type of SSI	SWAB Culture Report_Organism	SWAB Culture Report_Sensitivity	Surgical Intervention
90	Healthy	Healthy	Ceftriaxazone,Metro,Piptaz	5	1	Proteus	Piptaz	Sec Suturing Done On Pod 11
91	Healthy	Healthy	Cefotaxime,Metro	3				
92	Healthy	Healthy	Cefotaxime,Metro	3				
93	Healthy	Healthy	Piptaz,Metro	10	1	Proteus Mirabilis,Staph.Aureus	Piptaz	Sec Suturing Done Pod 14
94	Healthy	Healthy	Cefotaxime,Metro	3				
95	Sec.Suturing Done	Healthy	Piptaz,Metro,Imipenam	8	1	E.Coli,Proteus	Imipenam	Sec Suturing Done On Pod 21
96	Healthy	Healthy	Cefotaxime,Metro	3				
97	Healthy	Healthy	Cefotaxime,Metro	3				
98	Healthy	Healthy	Cefotaxime,Metro	3				
99	Healthy	Healthy	Cefotaxime,Metro	3				
100	Healthy	Healthy	Cefotaxime,Metro	3				