

## FREQUENCY AND PATIENT RELATED RISKS FOR SURGICAL SITE INFECTION

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### ABSTRACT

**Objective:** To determine the frequency of surgical site infection (SSI) and its unknown risk factors in obstetrical and gynaecological procedures.

**Study Design:** Descriptive study

**Place and Duration of Study:** Obstetrics and Gynaecology department of Combined Military Hospital, Lahore from Oct 2009 to April 2010.

**Patients and Methods:** Patients who had undergone their surgical procedures in obstetrics & Gynaecology from October 2009 to April 2010.

**Results:** A total number of 1199 procedures were performed. Only 23 (1.92%) got SSI. Out of these 19 (82.6%) were lower segment cesarean section and 4 (17.4%) cases hysterectomies. In these infected cases, 19 (82.6%) were less than 40 years of age & 4 (17.4%) cases were more than 40 years of age. Six (26.1%) patients belonged to high & 17 (73.9%) to low socioeconomic class. Nineteen (82.6%) patients weighted more than 75 kg and 4 (17.4%) were less than 75 kg. Only 2 (8.7%) were diabetic & 21 (91.3%) were non diabetic.

**Conclusion:** Surgical site infection remains the commonest complication of surgery and is a burden on health care resources. It can be prevented by identifying those at higher risk and modifying skills for their care. Increasing age, obesity, Diabetes and low socioeconomic class could be the risk factors for SSI.

**Keywords:** Risks for wound infection, Surgical site infection, Wound infection.

### INTRODUCTION

Surgical Site Infection (SSI) is an Infection that occurs within 30 days of an operation, (that may be superficial or deep) with at least one of the following reasons. Firstly, Prulent drainage, with or without lab confirmation, secondly, Organisms isolated from an aseptically obtained culture of fluid or tissue from the incision site, thirdly, at least one of the following signs or symptoms of infection, pain or tenderness, localized swelling, redness or heat or fever and superficial incision deliberately opened up by the surgeon, unless incision is culture negative and lastly, Diagnosis of incision SSI by the surgeon or attending physician<sup>1-3</sup>.

It is estimated that millions of surgical procedures are performed annually. Surgical site infection (SSI) continues to be a major source of morbidity after operative procedures. Despite application of refined surgical skills, scrubbing up techniques, environmental

changes in operating room and the use of preventive antibiotics, infection at surgical site remains common event<sup>4</sup>. Even in the developed world like United States the reported rate of SSI is 2.6% for all operations<sup>5</sup>. It seems that overall SSI rates are higher than that reported<sup>5</sup>.

In an era of global economic recession in which the costs for surgery is concern for a country like Pakistan, SSI prolongs hospital stay and increases cost and burden on health care providers as well as on patient's pocket. This can be avoided if infection had not occurred. This research is meant to find the frequency and providing information's regarding patient related risk factors for SSI.

The objective of this study is to describe the frequency of SSI and its known risk factors in obstetrical and gynecological surgery.

### PATIENTS AND METHODS

This descriptive study was conducted from October 2009 to April 2010 on patients who had their surgical procedures in obstetric and gynaecology, CMH Lahore. Information was collected on a structured Performa from

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patient's hospital record charts for thirty days after surgery. The patient related risk factors which we studied were age and weight of the patients, their socioeconomic status and presence of Diabetes Mellitus. Regarding age, we divided the patients in two groups, those with age less than 40 years and more than 40 years. The grouping of patients for weight was in greater than 75 kg and less than 75 kg. Socioeconomic class was divided into high (belonging to officers class) and low (belonging to soldier class) groups. Study included all the patients whether booked or un-booked, who underwent major abdominal procedures (Elective/ Emergency) in the department of obstetrics and gynecology at CMH Lahore. All the patients who underwent surgeries out side CMH Lahore, and presented later on with SSI were excluded. Patients of wound hematoma, whose wound were opened deliberately by surgeons, and all of other such patients with intentional re-opening of wound with negative cultures were not considered. The patients with mild signs of inflammation such as erythema, and tenderness, and no wound gaping/ discharge were considered to be probably infected and followed on OPD basis till they either healed or became definitely infected and were included in the study groups accordingly.

Data was analyzed using SPSS Version 15. Descriptive variables were used to describe the data.

## RESULTS

Total numbers of procedures performed during the study period were 1199 and out of them 23 became infected at surgical site giving the frequency of SSI 1.92%. Out of 23 surgeries 19(82.6%) were lower segment cesarean section and 4 (17.4%) cases were of abdominal

hysterectomies.

A total number of 38 (3.2%) patients were followed on OPD basis with antibiotics and anti-inflammatory agents and were labeled as probably infected. However, all of such patients recovered completely, with no significant evidence of SSI.

Infected cases in age group less than 40 years were 19(82.6%) and in above 40 years were 4 (17.4%). The SSI occurred in 19(82.6%) patients having weight greater than 75 kg and only in 4 (17.4%) having weight less than 75 kg.

In high socioeconomic class only 6 (26.1%) while 17 (73.9%) from low class became infected. Two (8.7%) were diabetic and 21(91.3%) were non-diabetic.

## DISCUSSION

Infection has always been a feature of human life and sepsis in modern surgery continues to be a significant problem for patients and their health care providers across the globe. Wound infection not only increases morbidity, hospital stay, and treatment costs but also causes psychological trauma to patients and their care providers.

In our study, the rate of SSI was 1.92% which is significantly lower than that reported by Salman 8.39%<sup>6</sup>, Merthy 13%<sup>7</sup> and desa LA 18.9%<sup>8</sup>. This lower rate reported in our study could be due to a number of factors which includes better sterilization in our hospital, good hygiene of the selected population and small sample size.

A number of factors affect wound healing and infection at surgical site could be the result of one single factor or interaction of these factors. In this study we have gone through some of the patient related risks which

**Table 1: Distribution of Infected cases (n=25)**

Risks	Groups	No of Patients	Percentage
Age	<40 years	19	82.6%
	>40 years	4	17.4%
Weight	>75 kg	19	82.6%
	<75 kg	4	17.4%
Socioeconomic Class	High	6	26.1%
	Low	17	73.9%
Diabetes	Yes	2	8.7%
	NO	21	91.3%

influence healing and predispose to infection.

Frequency of SSI was higher in patients of less than 40 years in our series. In other studies the rate of SSI increases with increase in age as reported by Curse P<sup>9</sup>, Davidson<sup>10</sup>, and Kye<sup>11</sup>. This difference in reported cases of SSI is due to the fact that in our case series the number of procedures performed in younger age group were higher so giving higher rate of SSI.

The SSI rate was more common in lower socio economic class which is similar to that reported by Nell Tharpe<sup>12</sup>. The low rate of SSI in high socio economic class is due to their better hygiene practices and improved nutrition along with awareness towards wound care. Research has shown that tissue regeneration is affected by vitamin C, zinc, iron and oxygen and deficiency of these micronutrients in diet can be a factor for poor wound healing and SSI in lower socioeconomic group. Through an expansion of patient education efforts and development of practices that evaluate and treat those women who are poorly nourished, the morbidity associated with surgical procedures can be minimized.

In our study rate of infection increased with increase in body weight. The same increased risk is reported by Bertin<sup>13</sup>.

Another study done in the USA in which effect of percent body fat on SSI was concluded and authors concluded that obesity defined by percent body fat is associated with a five fold increase in SSI risk<sup>14</sup>.

Wound infection remains an important problem in diabetic patients. We had only 8.2% of infected patients with diabetes. This number is less as compared to overall infection rate. Indeed studies have demonstrated that the risk of SSI is correlated with the degree of glucose elevation and strict glucose control decreases the risk and rate of SSI<sup>15</sup>.

## CONCLUSION

Surgical site infection (SSI) continues to be the most common complication following surgical procedures and is a great burden on patient and health care system. These infections are sum of several factors like introduction of bacteria in the wound, virulence of contaminants, microenvironment of each wound and integrity of patient's host defense mechanism.

Increasing age, obesity, Diabetes and low socioeconomic class were frequently observed patients with SSI.

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