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## A study of surgical site infection in obstetrics and Gynaecological surgeries in a tertiary care set up

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### Abstract

**Background:** Surgical Site Infections (SSI) is the third most commonly reported nosocomial infection which has an adverse impact on the hospital as well as on the patient. Global estimates of surgical site infection (SSI) ranges 0.5- 15%. The overall incidence of SSI in India is from 10-33%. The incidence of SSI in the Obstetric Population varies with rates ranging from 2.8-26.6%.

### Objectives

1. To incidence of SSI in patients operated in department obstetrics and gynaecology.
2. To identify the risk factors for SSI.
3. To study the microbiological profile and antibiotic sensitivity of SSI in our institute.
4. To recommend the preventive measures.

**Methodology:** We conducted a 2 year retrospective study of SSI in our hospital. Total 2673 cases operated in Obstetrics and Gynaecology were included in the study.

Data collection done from -SSI register, IPD files, Laboratory registers.

**Results:** In obstetrics- anaemia, multiparity & poor pre-op preparation were found to be most common causes and in Gynaecology- advanced age was found to have most common cause.

Obesity & Diabetes mellitus were common factors in both group. *Escherichia coli* was the commonest pathogen, followed by *Staphylococcus aureus* 22%. The incidence of SSI in our set up is 2.9%.

**Conclusion:** We found that in order to decrease the incidence of SSI we should have proper preoperative work up, correction anaemia, sugar levels, active surveillance of SSI by cooperation of infection control inspectors and surgical team.

**Keywords:** SSI, incidence, risk factors, pathogen

### Introduction

Nosocomial infection constitutes a major public health problem worldwide [1]. Despite advances in operative techniques and a better understanding of the pathogenesis of wound infection and wound healing, surgical site infections continue to be a major source of morbidity and mortality for patients undergoing operative procedures.

The overall incidence of wound sepsis in India is from 10%-33% [2]. However, the incidence of wound complications in the obstetric population varies with rates ranging from 2.8% to 26.6% [3]. SSIs are the indicators of quality of health care [4]. Analysis of the reliable hospital data will help to determine the factors responsible for SSI and thereby will help in preventing them.

### Material and Methodology

#### Study unit

All patients who underwent elective and emergency surgeries in obstetrics and gynecology department of our institute and who developed SSI after surgery were included in the study.

#### Study setting

This is retrospective study was carried out in Smt. Kashibai Navale Medical College and general hospital, Nahre, Pune. The study was done between January 2018- December 2019 in the department of Obstetrics and Gynaecology.

#### Sample size

All the patients undergone major emergency and elective surgeries in between January 2018- December 2019 were included.

**Methods**

It is a 2 year retrospective study carried out between January 2018 - December 2019, SKNMC & GH PUNE. Complete data regarding preoperative, intraoperative and postoperative information was obtained from SSI register, IPD files, lab registers and was analysed statistically.

**Inclusion criteria**

1. Patients underwent major obstetric & gynaecological abdominal surgeries at SKNMC&GH, Pune.
2. SSI occurs within 30 days post operatively.
3. SSI involves only the skin or subcutaneous tissue.

**Exclusion criteria**

1. Vaginal surgeries
2. Laparoscopic surgeries.
3. Small incision abdominal surgery like tubal ligation

**Results**

In 2 years 4345 surgeries were performed in our department out of which 2673 fulfill the criteria for our study cases it includes all the patients who undergone elective and emergency surgery during January 2018- December 2019, out of which 72 cases suffered from SSI.

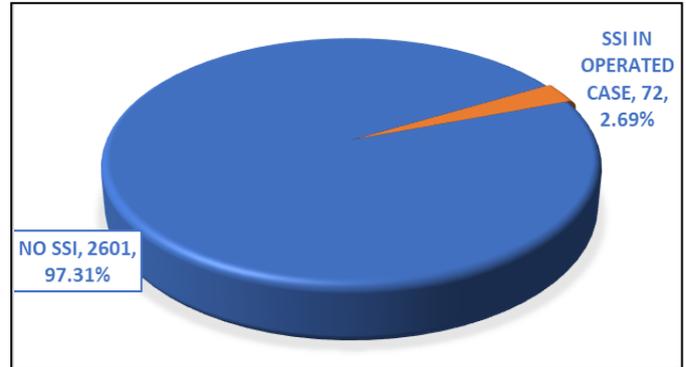
Out of operated 2673 cases 1971 cases were emergency surgery of which 58 patients developed SSI which accounts for 2.08% of SSI

in our study and 702 were elective surgery of which 14 developed SSI which accounts for 1.99% in our study, shown in table no.1.

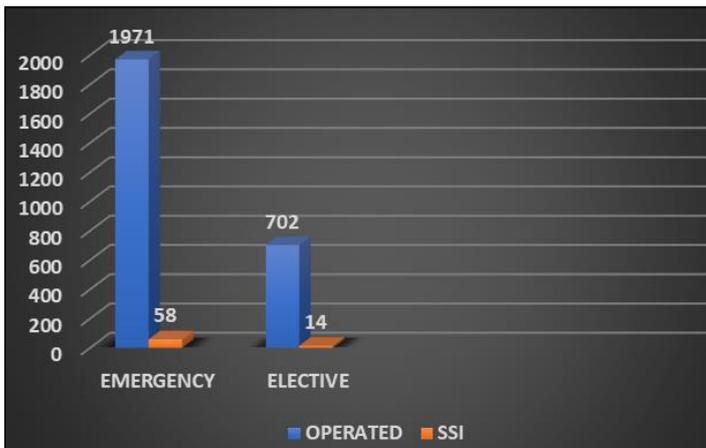
**Table 1:** Shows the distribution of SSI in different types of operations

Type of Surgery	Surgical site infection		Total	% of SSI
	Yes	No		
Elective	14	688	702	1.99
Emergency	58	1913	1971	2.08
Total	72	2601	2673	

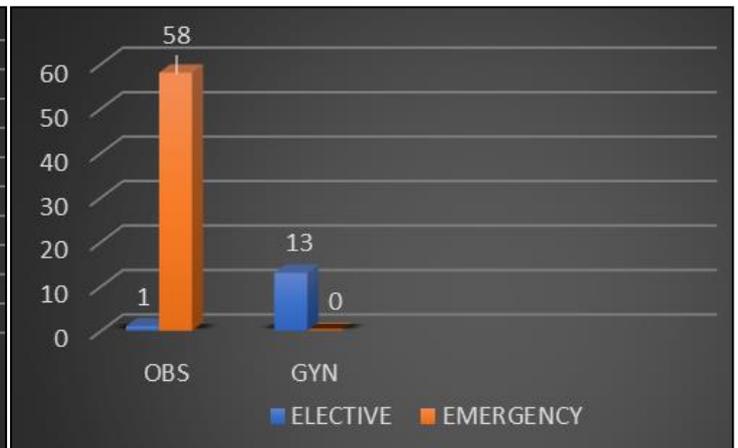
Chi square= 1.433 with 1 degree of freedom and p-value=0.231



**Fig 1:** Rate of SSI In Operated Patients



**Fig 2:** SSI in type of surgery



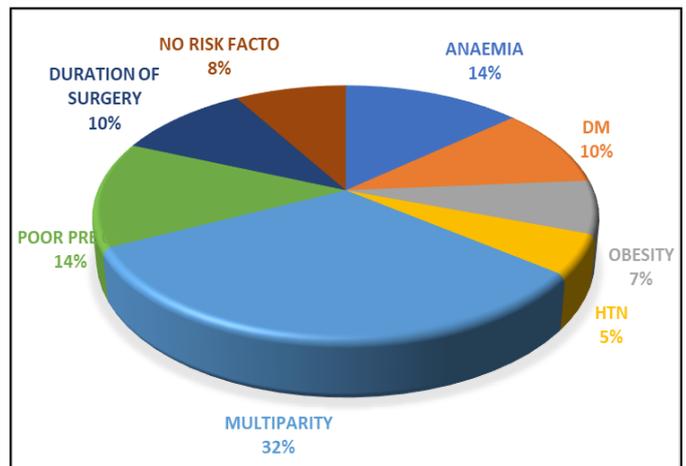
**Fig 3:** SSI among different surgeries

The most common risk factors for SSI in obstetrics patients were multiparity (32.2%), anaemia (13.5%), & poor pre-op preparation\*(13.5%). shown in table no.2 and figure no.4

**Table 2:** Risk Factors Found In SSI Of Obstetrics Surgery

Risk factor	Number of SSI	Percentage
Anaemia	8	13.5
Diabetes Mellitus	6	10.16
Obesity	4	6.77
Hypertension	3	5.08
Multiparity	19	32.2
Poor pre-operative preparation	8	13.5
Duration of surgery(>2hrs)	6	10.1
No risk factor found	5	8.47
Total	59	

(\*poor pre-operative preparation in obstetrics include- poor preparation of incision site in emergency)

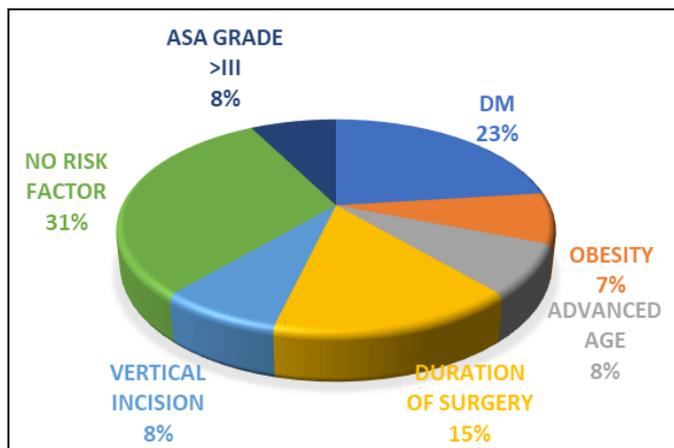


**Fig 4:** Risk factors found in SSI of obstetrics surgery

**Table 3:** Risk factors found in SSI of Gynaecology surgery

Risk factors	Number of SSI	Percentage
Diabetes mellitus	3	23.07
Obesity	1	7.69
Hypertension	0	0
Advanced age	1	7.69
Duration of Suregery(>2hrs)	2	15.38
Vertical incision (for benign and malignant indication)	1	7.69
Asa grade >iii	1	7.69
No risk factor	4	30.76
Total	13	

The most common risk factors for SSI in gynaecology patients were Diabetes Mellitus (23.07%), horizontal incision (23.07%), & duration of surgery >2 hrs(15.38%).shown in table no.3 and figure no.5



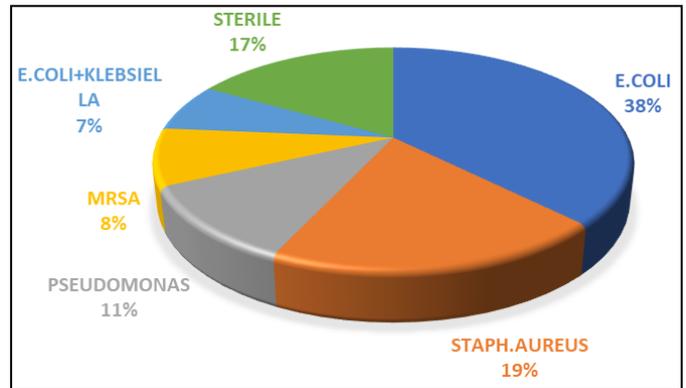
**Fig 5:** Risk factors found in SSI of Gynaecology surgery

The predominant pathogens in our setup according to the data provided by the Infection Control Committee of our hospital and our SSI bacteriological profile we found that *Escherichia coli* was the commonest pathogen, followed by *Staphylococcus aureus*, third commonest was *pseudomonas*.

Antimicrobial susceptibility was done by Kirby-Bauer disc diffusion method and shows that pathogen at our setting was susceptible to cefotaxime most, followed by amikacin and third comes the amoxicillin and clavulanic acid

**Table 4:** Organisms isolated on wound swab culture

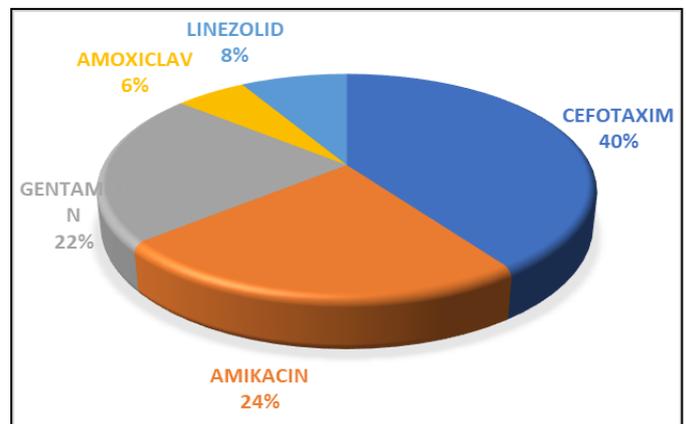
Micro-organism	N (%)
<i>E. coli</i>	27(35.5%)
Staph. aureus	14(19.44%)
Pseudomonas	8(11.11%)
Mrsa	6(8.33%)
E.coli+klebsiella	5(6.94%)
Sterile	12(16.66%)
Total	72



**Fig 6:** Organisms isolated on wound swab culture

**Table 5:** Antibiotic sensitivity for the organisms

Sensitive antibiotics	N(%)
Cefotaxim	29(40.27%)
Amikacin	17(23.61%)
Gentamicin	16(22.22%)
Amoxiclav	4(5.55%)
Linezolid	6(8.33%)
Total	72



**Fig 7:** Antibiotic sensitivity for the organisms

**Discussion**

Hospital acquired infections are notorious and surgical site infections (SSI) form a major constituent of them. They are noted to be a significant problem, depicting the hospital performance as a whole and negatively affect the image of the health care facility. They limit the potential benefits of a surgical intervention and lead to significant increase in morbidity, length of hospital stay and health care cost. The present study reports a combined incidence of 2.69% SSI for both Obstetrics and Gynecological surgeries which is less than study conducted by Dr. Harish Babu B G and *et al.*, 9.13% [5] and less than a study conducted by Amrita R. Bhadauria *et al.*, 6.12% [6]. Incidence of SSI in our study for gynaecological surgeries was 1.9%.

Obstetrical surgeries in which we found that for elective c-section it was 2.08% and for emergency c-section it was 2.94% which is less than a study conducted by Dr.Ganesh Mhaske and

*et al.* which is 3.5% for elective and 4.9% for emergency LSCS in the same department for year 2017 [7] which found to be improved in our study.

The major causes for SSI in obstetrics were found to be anaemia, multiparity & poor pre-op preparation compared to anaemia blood transfusion and post partum hemorrhage found by Dr. Ganesh Mhaske and *et al.* [7].

The major cause for SSI in gynaecology patients was advanced age and BMI was found to be the major cause in Gynaecology surgeries by Snehal Ashok Naphade and *et al.* [8].

In our study we found out the common factors responsible for SSI in both Obstetrical and Gynaecological surgeries were obesity & diabetes mellitus which is comparable to study conducted by Ashish Pathak and *et al.* in which the found age and glucose level common in obstetrics and gynaecological surgeries [9].

Most common micro-organisms in our set-up responsible for most ssi were coli, staph aureus which is same as found by Dr. Harish Babu B G ant *et al.* [5] and Dr. Ganesh Mhaske and *et al.* [7].

Antibiotic sensitivity result shows most micro-organism were sensitive to cefotaxim, amikacin similar study in by Dr. Ganesh Mhaske and *et al.* [7] in which they study post caesarean wound infection antibiotic susceptibility found most micro-organism were sensitive to amikacin and ciprofloxacin.

### Conclusion

This study helped us to get an insight into local microbial aetiology in obstetrics and gynaecological surgeries as well as their susceptibility pattern to antibiotics. Furthermore, the high prevalence of antibiotic-resistant strains also point to the concerning problem of irrational and prolonged use of antibiotics.

### Based on our study we recommend following preventive measure

1. Proper preoperative work up.
2. Correction anaemia, sugar levels.
3. Sound surgical techniques.
4. Active surveillance of SSI by cooperation of infection control inspectors and surgical Team.

### Acknowledgments

We would like to thank to Department of Obstetrics and Gynaecology and record section department of Smt. Kashibai Navale medical college and general hospital.

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