International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Research Article

A Study of Surgical Site Infections in Obstetrics and Gynaecological Surgeries in A Tertiary Care Center: A Retrospective Cohort Study

Telugu Siripriya Reddy[1], Mahfrid N Dharwadkar[2], Anusuya.S.K[3]

[1] Junior Resident, Department of Obstetrics and Gynaecology, Akash Institute of Medical Sciences and Research Centre, Devanahalli
[2] Associate Professor, Department of Obstetrics and Gynaecology, Akash Institute of Medical Sciences and Research Centre, Devanahalli
[3] Professor, Department of Obstetrics and Gynaecology, Akash Institute of Medical Sciences and Research Centre, Devanahalli

OPEN ACCESS

Corresponding Author:

Telugu Siripriya Reddy

Junior Resident, Department of Obstetrics and Gynaecology, Akash Institute of Medical Sciences and Research Centre, Devanahalli

Received: 02-08-2025
Accepted: 24-08-2025
Available Online: 07-09-2025

ABSTRACT

Objective: Retrospective analysis of SSI's in operated patients from department of Obstetrics and Gynaecology of tertiary care center.
Methodology: A total of 881 women underwent obstetric and gynaecological surgeries over the period of 28 months from February 2022 to may 2024. This data was accessed using the database from the medical records department of the institute. Amongst them 82 of them were afflicted with SSI(n=82). These women were analyzed for patient profiles, risk factors, associated comorbidities, indications for surgery, duration of surgery and causative organisms.
Results: Women above the age of 35 had the highest incidence of SSI 46.3%. When it came to the educational status the highest incidence was noted amongst <12th grade women 76.8%, most of whom were from the the rural areas 75.6%. Curiously these women were hailing from the upper class (57.3%) of the socio-economic distribution. To no-one's surprise a duration of the surgeries for >75 minutes had a contribution of 50% of the patients. Reiterating the association of anaemia (53.6%) and high BMI (39%) as a important contributors to SSIs. Lastly the causative organisms identified were E coli(28%) followed by MRCONs (23.2%) and others.
Conclusion: It has been worthwhile to note that the incidence of SSI during this period was 9.3%. Among these women co-morbidities such as anaemia, higher BMIs had a significant input, with association of factors such as duration of surgery contributing to this outcome.

Keywords: *SSI, women, Surgery*

INTRODUCTION

An infection at the site of a surgical incision that develops within 30 days after surgery—or within a year if a prosthetic is implanted—is referred to as a Surgical Site Infection (SSI). SSIs are relatively common, with incidence rates ranging from 0.5% to 15%, depending on the type of surgical procedure and associated risk factors. They are the most frequent healthcare-associated infections (HAIs), accounting for 31% of all HAIs among hospitalized patients.

The incidence of SSIs following gynecological procedures was highest in abdominal hysterectomy (3.3%), followed by gynecologic laparotomy (1.3%), and gynecologic/obstetric surgery (1.1%)[1]. Obstetric surgeries showed a lower SSI prevalence compared to gynecological surgeries (1.2% vs. 10.3%, respectively)[2].

SSIs represent a significant clinical problem, limiting the potential benefits of surgical interventions. Despite advancements in the understanding of pathophysiology and improved preventive measures, SSIs remain a major contributor to

postoperative morbidity, increased healthcare costs, and prolonged hospital stays[3]. Exogenous and/or endogenous microbes penetrate the surgical site during surgery (primary infection) or after the procedure (secondary infection)[4,5].

The majority of SSIs are straightforward infections that just affect the subcutaneous tissue and the skin, although they can occasionally develop into necrotizing infections[6]. Surgical wounds that are infected typically appear with pain, warmth, swelling, pus development, and erythema. The prevention of SSI is the primary responsibility of the surgical team and hospital administration[7]. The aim of the present study was to estimate the occurrence of postoperative SSI within a single gynecology and obstetric department and to identify the associated risk factors and common responsible pathogen.

METHODOLOGY

This is a Retrospective analysis done in the Department of Obstetrics and Gynecology, Akash hospital over a the period of 28 months (February 2022 to may 2024).

Inclusion criteria

1. Patients who underwent major obstetric & gynecological abdominal surgeries during the study period.
2. SSI occurring within 30 days post operatively.
3. SSI involving only the skin or subcutaneous tissue

Exclusion criteria

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

The study was initiated after approval by the Institutional Ethics Committee (IEC) and Scientific Research Committee of Akash Institute of Medical Sciences and research center, Bangalore.

On admission relevent investigations were done and a surgical intervention was decided. The required pre anaesthetic work up was done as per protocol and patient underwent surgery accordingly.

A detailed proforma for the collection of data pertaining to patients in this study was prepared, and the details were collected from the database of medical records department was accessed. Patient profiles, risk factors, associated comorbidities, indications for surgery, duration of surgery and causative organisms were assessed.

RESULTS

Of the total of 881 patients who had undergone obstetrics and gynecological procedures, 82 patients developed SSI. Most patients belong to the age group of >35 years. Age range is from 18 - 70 years (Mean ± = standard deviation: 35.7 ± 13.7). Table 1 demonstrated patient classification on the basis of SSI status. The higher proportion of 90.6% SSI was absent, and the lower proportion of 9.2% SSI was present.

Table 1:- Distribution of subjects according to Age group

SSI status	Frequency	Percentage
Total	881	100
Present	82	9.30
Absent	799	90.6

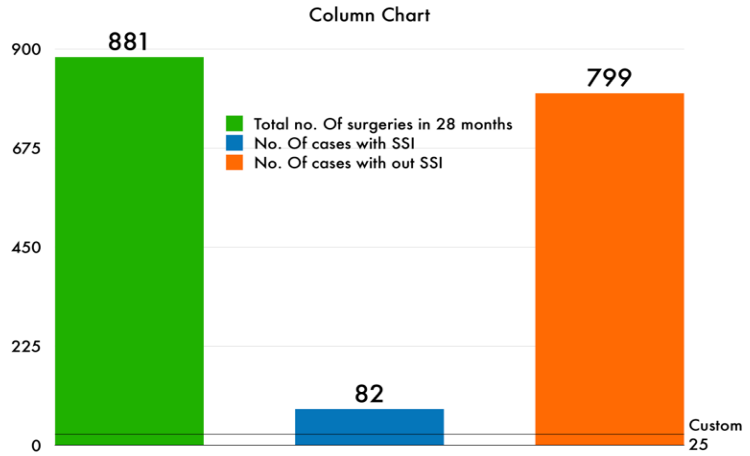

Figure 1:- Graph showing classification of subjects according to SSI status

The distribution of a total of 82 patients on the basis of age group demonstrated a higher proportion of 46.3% are under 35 years followed by 17.3% belonging to 25-30 years.

Table 2:- Distribution of subjects according to Age group

	N	%
<25yrs	6	7.3
25-30yrs	14	17.1
31-35yrs	4	4.9
>35yrs	38	46.3

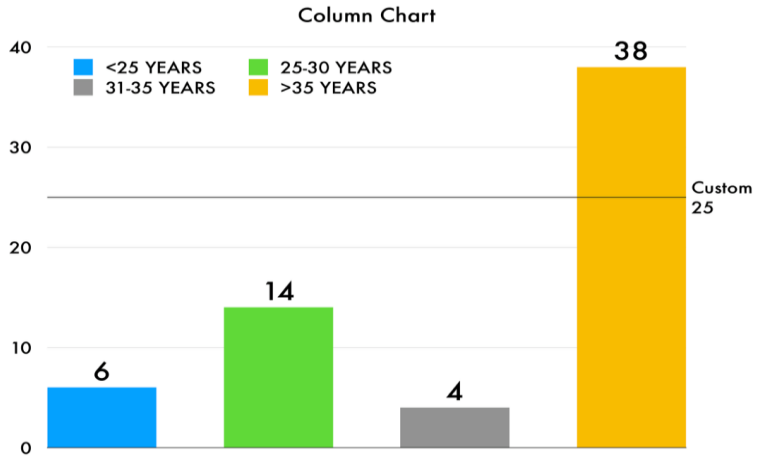

Figure 2:- Graph showing Distribution of subjects according to Age group

Table-3 demonstrates the association between the type of incision and SSI status
According to the type of incision, a higher proportion of 32.9% was for lower transverse incision followed by Joel-cohen incision with 29.3%.

Table 3:- Distribution of subjects according to Type of incision

Type of insicion	N	%
Pfennenstiel	21	25.6
Joel-cohen	24	29.3
Lower transverse	27	32.9
Mid line	6	7.3
Laparoscopic port	6	7.3

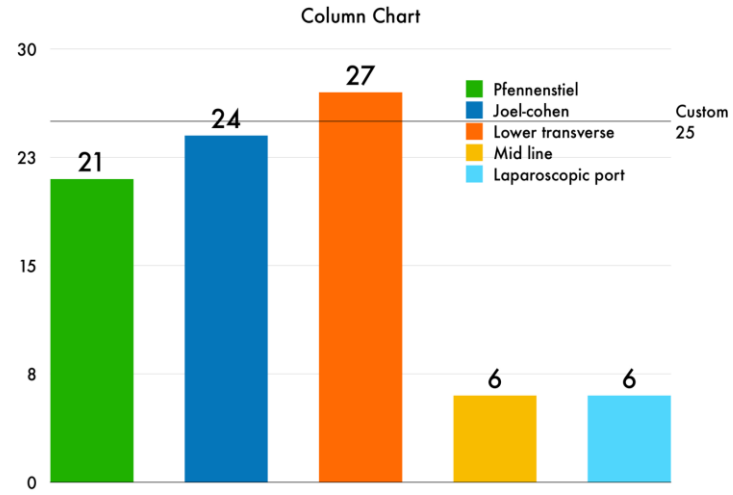

Figure 3:- Graph showing Distribution of subjects according to Type of incision

According to the duration of hospital stay, 58.5% patients had stayed for <3 days after surgery followed by 18.2% for 3 -5 days and 8.5% of the patients got readmitted after diagnosing with SSI with majority of 80.4% got treated on OPD bases.

Table 4:- Distribution of subjects according to Duration of hospital stay

	Before diagnosing SSI	%	After diagnosing SSI	%
<3 days	48	58.5	4	4.8

3-5 days	15	18.2	7	8.5
5-7 days	12	14.6	2	2.4
>7 days	6	7.3	3	3.6

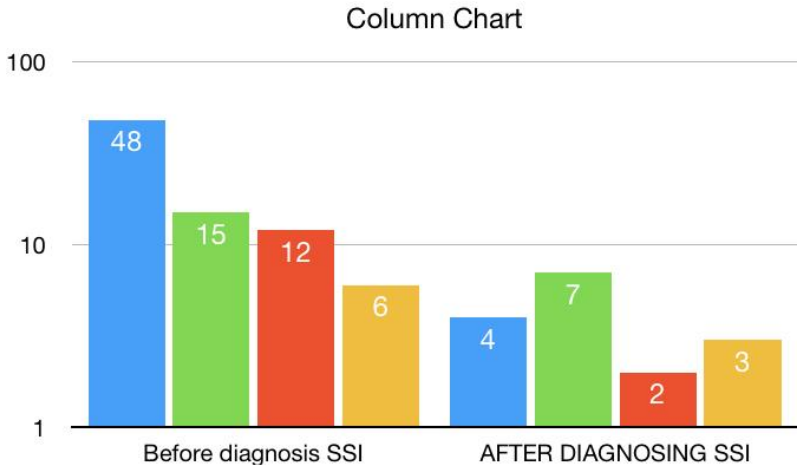

Figure 4:- Graph showing Distribution of subjects according to Duration of hospital stay

According to the duration of surgery majority of the case with SSI had duration of surgery >75 minutes with 50% followed by 23.2% with 61-75 minutes and only 6.1% had SSIs with duration of surgery <45 minutes

Table 5: - Distribution of subjects according to Duration of surgery

	N	%
<45min	5	6.1
46 - 60 min	17	20.7
61-75 min	19	23.2
>75 min	41	50.0

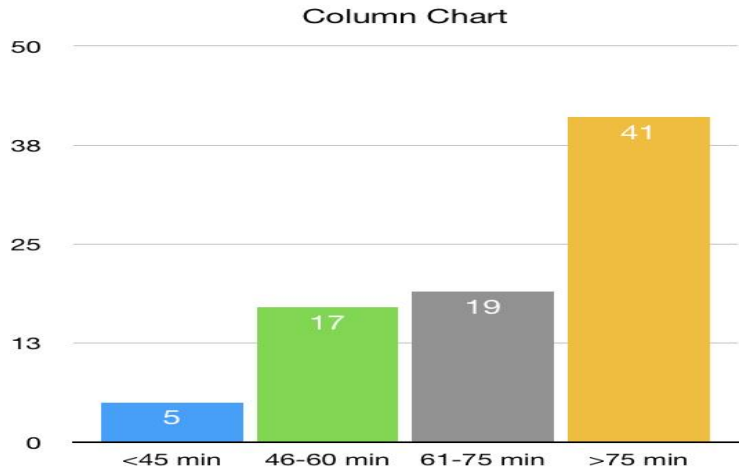

Figure 6: - Graph showing Distribution of subjects according to Duration of hospital stay

In our study most common risk factor seen in association with SSI was anemia (Hb<11g/dl) with 53.6% followed by BMI>25 with 39%, hypothyroidism (23.2%), previous blood transfusions (22%), hypertension (18.3%), UTI and T2DM (15.9%), GDM and fever during pregnancy (11%), PIH/PI (8.5%), PROM/PPROM (6.1%), febrile illness (3.7%), asthma (1.2%)

Table 6:- Distribution of subjects according to the associated risk factors

	N	%
PIH/ PE	7	8.5
HTN	15	18.3
GDM	9	11.0
T2DM	13	15.9
Hypothyroid	19	23.2

Asthma	1	1.2
BMI >25	32	39.0
PPROM/PROM	5	6.1
Fever during pregnancy	9	11.0
febrile illnesses	3	3.7
Blood transfusion	18	22.0
UTI	13	15.9
Anemia < 11g/dl	44	53.6

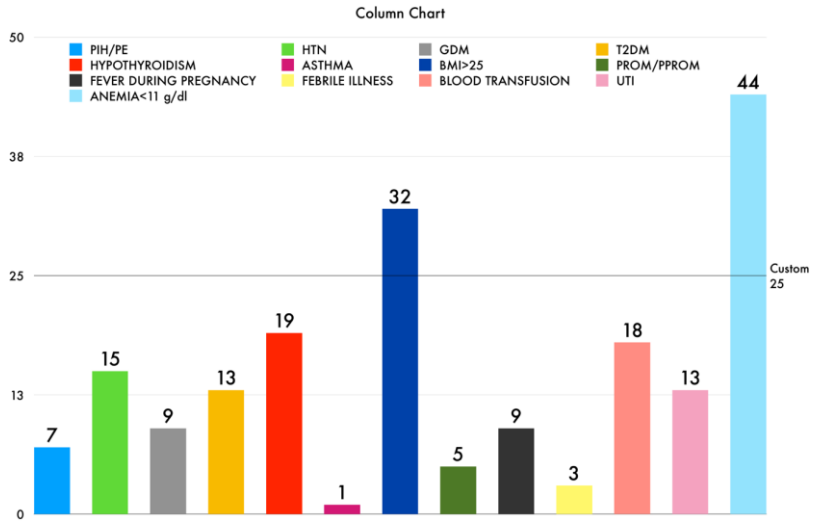

Figure 6:- Graph showing Distribution of subjects according to the associated risk factors

In our study, the highest proportion i.e, 28% was for E.coli followed by MRCoNS with 23.2 %, MRSA with 15.9%. Other Notable Pathogens like Acinetobacter species (6.1%), Enterococcus species (3.7%), Staphylococcus aureus (3.7%), Klebsiella pneumoniae (2.4%), Multidrug-resistant (MDR) Klebsiella species (2.4%), Pseudomonas species (1.2%), Diphtherioids (1.2%), Citrobacter freundii (1.2%). MRCoNS + E. coli (co-infection) (1.2%), E. coli + Enterococcus (co-infection) (1.2%).

Table 7:- Distribution of subjects according to the Organism isolated

	N	%
Sterile growth	7	8.5
Ecoli	23	28.0
MRSA	13	15.9
MRCoNS	19	23.2
Enterococcus	3	3.7
Acenetobactor	5	6.1
Staphylococcus aureus	3	3.7
Klebsiella pnemoniae	2	2.4
MRCoNS+Ecoli	1	1.2
Diphtherioids	1	1.2
Pseudomonas	1	1.2
Cirtobacter frendii	1	1.2
Ecoli+ enterococcus	1	1.2
MDR klebsilla .sp	2	2.4

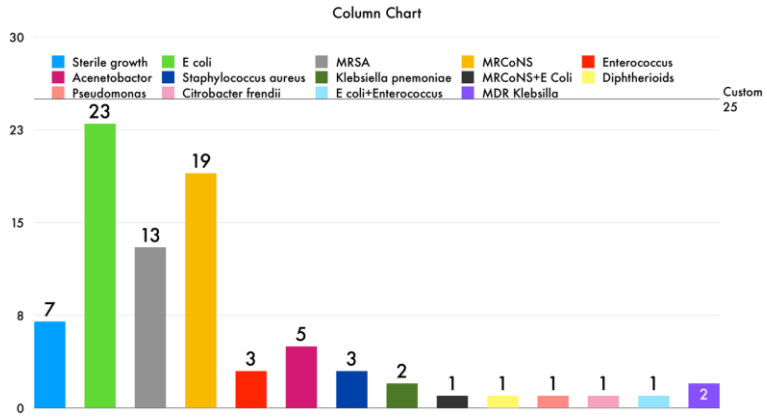

Figure 7:- Graph showing Distribution of subjects according to the associated risk factors

DISCUSSION

This retrospective study, conducted over a period of 28 months, included 881 patients who underwent major obstetric and gynecological abdominal surgeries. The surgical site infection (SSI) rate was 9.3% (n=82). Despite adherence to appropriate antibiotic prophylaxis and strict aseptic measures, SSIs remained the most common postoperative nosocomial infection.

The variation in prevalence of SSI depended on various factors such as sample size, use of standard antibiotic prophylaxis, associated co-morbidities, referred cases from primary health centres as emergencies who have been handled outside and aseptic measures.

The incidence of SSI in our study was 9.3%, which is comparable to the rates reported by De D et al. (2013) at 10.5% and Wassef et al. at 10.4%. In contrast, a higher incidence was noted by Smriti Gupta et al. (21%), whereas lower rates were observed in studies by Gupta et al. (6%) and Pathak et al. (7.8%).

In our study, the majority of patients had a mean age of 35.7 years, which did not closely align with other studies. For instance, Smriti Gupta et al. reported most cases in the 40–45-year age group, and Ashish Pathak et al. observed a higher prevalence in patients over 40 years. Conversely, Pathak et al. reported a lower mean age of approximately 29.6 years, suggesting a younger study population. These variations indicate that while age may influence the risk of SSIs, it is not an independent or strongly significant factor across all populations.
Notably, a large proportion of the cohort belonged to rural areas (75.6%), which could influence access to healthcare, timely diagnosis, and follow-up.

The educational status in our study revealed that 58.6% of the subjects had education below high school, with 18.3% being illiterate. Similarly, the study by Gupta et al. reported 32% illiteracy and 28% with only primary education. Fultariya et al. also found comparable results, with 33.5% illiterate participants and 27% having primary education. These findings suggest that lower educational levels may negatively impact awareness regarding wound care, hygiene, and early recognition of symptoms, thereby contributing to an increased risk of surgical site infections.

In our study, more than 50% of SSIs occurred in surgeries lasting over 75 minutes, which is comparable to the findings of De et al., where procedures exceeding one hour showed the highest incidence of SSIs. Similarly, Mangram et al. reported that with each additional 30 minutes of surgical duration, the risk of SSIs increases by 1.3 times, highlighting that longer operative time is a significant contributing factor to the development of surgical site infections.

In our study, the most common risk factor associated with SSIs was anemia (Hb <11 g/dL), observed in 53.6% of cases, followed by BMI >25 in 39% and hypothyroidism in 23.2%. These findings are comparable to those reported by Divya Fultariya et al., where anemia was the most prevalent risk factor (34.9%), followed by BMI >24.9 (23.5%) and type 2 diabetes mellitus (7.54%). In contrast, the study by Smriti Gupta et al. identified BMI <18 (40%) as the most common risk factor, followed by BMI 25–29.9 (38%) and anemia (24%). Meanwhile, the study by Khaled Goma et al. reported obesity (21.9%), T2DM (14%), and hypertension (2.7%) as the leading risk factors, which differs from the pattern observed in our study.

In our study, the most commonly isolated organism was E. coli (28%), followed by MRCoNS (23.2%) and MRSA (15.9%). These findings are comparable to those of Divya Fultariya et al., where Staphylococcus aureus (28%) and E. coli (22%) were the two most prevalent pathogens, followed by Klebsiella (13%). In contrast, the study by Malakar A. et al. (2019) reported Staphylococcus aureus as the most frequently isolated organism (38%), with a high incidence of MRSA (42.86%), followed by Pseudomonas (23.91%). Similarly, De D. et al. (2013) found Acinetobacter species to be the most common isolate (32.03%), followed by MRSA (23.8%) and Staphylococcus aureus (21.09%). These variations in microbiological

profiles across studies may be attributed to differences in hospital settings, patient populations, and infection control practices.

CONCLUSION

In our study, the overall rate of SSI was 9.2%. Factors such as economic status, educational qualifications and access to standardized health care played a significant part in the manifestation of SSI. Along with above co-morbidities such as anaemia, obesity also played a significant role in the development of SSIs. Interestingly Ecoli a common pathogen and not a nosocomial organism was found to be the culprit in our study.

Judicious use of antibiotics including appropriate prophylactic regimens along with use of CARE bundles such as CAUTI; peripheral line and post operative surgical site care may better the outcomes of operated patients by preventing SSIs.

REFERENCES

1. García RB, Delagado M, Kuba EB, Cabello RR, Chessin A, Rendón JC. Infección del sitio quirúrgico. Experiencia de dos años en el servicio de ginecología y obstetricia del Hospital General de México. Ginecol Obstet Mex 2006;74:260-264.
2. Pathak A, Mahadik K, Swami MB, Roy PK, Sharma M, Mahadik VK, et al. Incidence and risk factors for surgical site infections in obstetric and gynecological surgeries from a teaching hospital in rural India. Antimicrob Resist Infect Control 2017;6:66.
3. Plowman R, Graves N, Griffin MA, Roberts JA, Swan AV, Cookson B, Taylor L: The rate and cost of hospital-
4. acquired infections occurring in patients admitted to selected specialties of a district general hospital in England and the national burden imposed. J Hosp Infect. 2001, 47:198-209.
5. Ayliffe GA: Role of the environment of the operating suite in surgical wound infection . Rev Infect Dis. 1991,
6. 13:S800-4.
7. Kolasiński W: Surgical site infections - review of current knowledge, methods of prevention . Pol Przegl Chir. 2018, 91:41-7.
8. Bayat A, McGrouther DA, Ferguson MW: Skin scarring. BMJ. 2003, 326:88-92.
9. Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR: Guideline for prevention of surgical site infection, 1999. Centers for Disease Control and Prevention (CDC) Hospital Infection Control Practices Advisory Committee. Am J Infect Control. 1999, 27:97-132.
10. Gupta S, Tyagi M, Gupta A, *et al*. Risk Factors for Surgical Site Infection in Gynecological Surgeries. J South Asian Feder Menopause Soc 2020;8(1):27–29.
11. Pathak A, Mahadik K, Swami MB, Roy PK, Sharma M, Mahadik VK, Lundborg CS. Incidence and risk factors for surgical site infections in obstetric and gynecological surgeries from a teaching hospital in rural India. Antimicrob Resist Infect Control. 2017 Jun 14;6:66. doi: 10.1186/s13756-017-0223-y. PMID: 28630690; PMCID: PMC5471730.
12. De D, Saxena S, Mehta G, Yadav R, Dutta R. Risk factor analysis and microbial etiology of surgical site infections following lower segment caesarean section. International Journal of Antibiotics. 2013, 2013.
13. Malakar A, Gopalan P, Barik S, Ray A. A study on the incidence of surgical site infections and related pathogens inobstetrics & gynecology in a tertiary care hospital in Andaman & Nicobar Islands. Epidemiology International. 2019;4(4):20-24.
14. Wassef MA, Hussein A, EM AR, El-Sherif RH. Aprospective surveillance of surgical site infections: Study for efficacy of preoperative antibiotic prophylaxis. African Journal of Microbiology Research. 2012;6(12):3072-3078.
15. Goma K, El Gelany S, Galal AF. Incidence and risk factors for surgical site infection post-gynecological operations in a tertiary hospital in Egypt: a retrospective study.Int J Reprod Contracept Obstet Gynecol 2022;11:299-303.
16. Fultariya D, Patel N, Chotaliya G. Incidence and risk factors for surgical site infections along with microbiological profile in obstetrics and gynaecological surgeries at referral hospital in Southern Gujarat. Int J Reprod Contracept Obstet Gynecol. 2023;12(3):755–760.