Section: OBS & Gynae

Original Research Article

PROSPECTIVE EVALUATION OF SURGICAL SITE INFECTIONS FOLLOWING MAJOR GYNECOLOGICAL SURGERIES AND ASSOCIATED RISK FACTORS

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Received : 17/03/2026
Received in revised form : 01/05/2026
Accepted : 15/05/2026

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DOI: 10.70034/ijmedph.2026.3.302

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (3); 1895-1901

ABSTRACT

Background: Surgical site infection is also an important complication after major gynecologic surgery that has been linked with higher morbidity, longer length of stay, further antibiotic administration, wound complications, and higher health care costs. Identifying risk factors associated with each infection is critical for better perioperative care and for the prevention of postoperative infection. **Aim:** To predict the incidence of surgical site infection after major gynecological surgeries and to evaluate the clinical, demographical, surgical and postoperative risk factors for surgical site infection in these patients in a prospective study.

Materials and Methods: The study was prospective observation and consisted of 104 patients who underwent major gynecological surgeries. Sociodemographic profile, clinical characteristics, comorbidities, preoperative status, operative findings and postoperative outcomes were assessed in patients. In the postoperative period, all patients were followed for signs of surgical site infection. Superficial incisional, deep incisional, and organ/space infections were defined as surgical site infections. Suspected cases were subjected to swabbing of the wounds and the samples were sent to culture and antibiotic sensitivity testing. The data were entered and analyzed in SPSS version 27.0 using Microsoft Excel. Data of categorical variables were presented as frequency and percentage and associations were tested using Chi-square test or Fisher's exact test. A p value <0.05 was deemed statistically significant.

Results: A total of 14 patients had SSI, with an overall incidence of 13.46% out of 104 patients. Superficial incisional SSI (64.29%) was the largest group followed by deep incisional SSI (28.57%) and organ/space SSI (7.14%). The most common clinical feature was wound discharge or pus in 10 patients (71.43%). Emergency surgery, wound class (p=0.004), surgery duration >120 minutes (p=0.005), anemia (p=0.042), diabetes mellitus (p=0.026), and transfusion of blood (p=0.038) were significant factors associated with SSI. In 12 cases of SSI (85.71%) culture was positive. The most prevalent organism isolated was S. aureus (33.33%) followed by Escherichia coli (25.00%).

Conclusion: Post-operative surgical site infection is still one of the major complications of post-operative period after major gynecological surgery. Important associated risk factors were emergency procedures, contaminated wound, prolonged surgery, anemia, diabetes mellitus and blood transfusion. The early recognition of high risk, optimization of medical condition before surgery, meticulous aseptics, adequate antibiotic cover and active monitoring of the wound after surgery might minimize the morbidity from SSI.

Keywords: Surgical site infection (SSI), a gynecological surgery, risk factors, wound infection.

INTRODUCTION

Surgical site infection is one of the important postoperative complications encountered after major gynecological surgeries. It can involve the cutting area, deeper soft tissues or the area where the organ has been operated on, depending on the depth and extent of the infection. The abdominal approach to hysterectomy, vaginal approach to hysterectomy, laparotomy for benign conditions and other major pelvic surgeries are some of the procedures performed in the treatment of gynaecological diseases. Because these surgeries frequently involve access to the genital tract, prolonged handling of tissue, blood loss, sutures, and the use of drains, as well as exposure to endogenous vaginal and skin and enteric flora, they tend to be complicated by infection. As a result of these, prevention and early detection of SSI in the perioperative period is a major concern when managing gynaecological surgery.[1] Major gynecological surgeries may be performed for many reasons, such as abnormal uterine bleeding, fibroid uterus, pelvic masses, endometriosis, pelvic inflammatory disease, uterovaginal prolapse, ovarian pathology. Despite the use of better anesthesia, asepsis, antimicrobial prophylaxis and postoperative monitoring, surgical site infection remains an avoidable source of morbidity. May result in the leakage of the wound, pain, fever, delayed healing, wound dehiscence, prolonged antibiotic therapy, longer hospitalisation, re-hospitalisation and in some cases repeated surgery. Hence, SSI is not only a clinical issue but also a measure of healthcare quality particularly in high-volume.[2] The multifactorial nature of SSI is dependent on patient, disease, procedure, and hospital related factors. Patient related factors are age, nutritional status, anemia, diabetes mellitus, obesity, immune suppression, smoking, and pre-existing infection. Occurrence of the surgical procedure, such as type of surgery, surgical route, length of surgical procedure, classification of wound, intraoperative blood loss, need for blood transfusion, use of drains, tissue damage, and proper use of aseptic precautions. Risk factors associated with the hospital environment, including the duration of the preoperative period, the environment of the operating room, the technique used for the sterilisation, when antibiotics are administered and how the wound is treated after surgery all have an impact on the risk of infection. It is important to recognise these risk factors to be able to plan for prevention and to help with recovery after surgery.[3] There are some special considerations for gynecological surgeries as compared to many other surgical disciplines. The female genital tract has a mixed flora and several procedures involve communication between sterile pelvic tissues and potentially contaminated areas of the vagina or cervix. Abdominal procedures could have a different risk profile to vaginal or minimally invasive routes due to the size of the incision, handling of tissues, the amount of tissue exposed and the necessary wound care following surgery. Emergency gynecological surgeries can be at increased risk due to limited time to correct anemia, manage blood sugars, bowel prep (when indicated), optimize comorbidities, and make comprehensive pre-operative evaluations. Thus, the process of risk assessment should start prior to surgery, and throughout the intraoperative and postoperative phases of surgery.[4] The standard definitions must be used to identify and monitor SSI. The most common classification of surgical site infections is into superficial incisional, deep incisional, and organ/space infections. Superficial: Infection of skin and subcutaneous tissues; Deep: Infection of layers of fascia and muscle. Organ/space infections are those infections that develop by entering or coming in contact with any part of the body that was opened or handled during the operative procedure, other than the incision itself. Standardized classification is essential because it facilitates uniform reporting, hospital to hospital comparison, evaluation of preventive interventions and clinical documentation. Systematic follow up is especially useful in prospective studies, as some infections do not become apparent until after hospital discharge.[5] It is important to understand that there is no single intervention that is sufficient to prevent SSI; a bundle-based approach should be used. Several important measures are taken before the surgery to reduce the risk of infection: preoperative bathing, optimization of comorbidities, correct timing and choice of prophylactic antibiotic treatment, correct skin preparation, ensuring a sterile environment, minimizing operative time, effective hemostasis, maintaining normothermia, careful handling of tissues and appropriate postoperative attention to the wound. Special care in gynecological surgery might be necessary for antiseptic of the vagina, handling of the bowel, care of the drain, and counseling of wound care after discharge. A prevention bundle is a well-structured prevention program that increases consistency of care and helps ensure that key preventive interventions aren't overlooked. Structured prevention bundle: A well-structured prevention program that increases consistency of care and helps ensure that key preventive interventions aren't overlooked.[6]

MATERIALS AND METHODS

The study was conducted on the patients who were admitted to the Department of Obstetrics and Gynecology for major operative procedure involving the female genitalia. All eligible patients were followed up prospectively from the perioperative period until the end of the postoperative follow-up period for the presence of surgical site infection. The subjects of the study were 104 patients who were treated at the surgery during major gynecological operations. All patients who were admitted for any elective or emergency major gynecological surgery were assessed based on the predefined inclusion and exclusion criteria. Informed consent was obtained in written form from all patients. Patients who had undergone abdominal hysterectomy, vaginal hysterectomy, laparotomy for benign gynecological disease and other major gynecological surgery, which involved operative intervention in the abdomen and pelvis, were included in the study population.

Inclusion Criteria

Patients who were going for any major gynecological surgery were included in the study. Informed consent was obtained and patients were included if they agreed to follow-up post surgery. Surgical procedures for women performed either as a choice or as a necessity were deemed suitable for inclusion.

Exclusion Criteria

Patients with wound infection at the operation site, patients who had minor gynecologic operations and patients who had not consented to and patients who were not followed up after the operation were excluded from the study. Incomplete clinical and/or operative records were excluded in the final analysis.

Methodology

Data was collected with the use of a structured proforma which was specially designed for the study. Information on sociodemographic factors, clinical profile, comorbid conditions, pre, intra and post-operative status and outcomes were collected. The demographic parameters measured were age, residence, socioeconomic status, BMI and parity. The clinical parameters recorded were the presenting diagnosis, menstrual history, obstetric history, history of previous surgery, anemia, diabetes mellitus, hypertension, immunosuppressive conditions and other relevant comorbidities.

All patients were extensively preoperatively evaluated, with history taking, general physical examination, systemic examination, and gynecological examination conducted. Laboratory investigations relevant to the disease and surgical fitness, including hemoglobin level, TLC, blood sugar levels, renal function tests, urine examination and others, were documented. Before surgery, nutritional status, anemia, diabetes mellitus, obesity, smoking and tobacco usage were evaluated. Other parameters recorded were preoperative antibiotic prophylaxis, skin preparation and preoperative hospital stay.

Surgical Parameters: For each of the patients, the following information was obtained: Type of surgery, Indication for surgery, elective or emergency surgery, path of surgery, type of incision, duration of surgery, blood loss during surgery, blood transfusion, presence of drains, occurrence of any intra-operative complications, and wound classification. Surgeon, type of anesthesia given and any intra-operative contamination noted. As appropriate, surgeries were categorized into standard wound categories as clean, clean-contaminated, contaminated, or dirty.

Postoperative Monitoring: During the postoperative period, all patients were monitored for the presence of any signs and symptoms suggestive of surgical site infection. Inspection of wounds was done every day during the hospital stay and any of the following was noted: pain, redness, swelling, increased temperature, serous discharge, purulent discharge, gapping of wound, fever, and delayed wound healing. The postoperative parameters such as duration of hospital stay, antibiotic usage, requirement for dressing wounds, secondary suturing, readmission and other complications were also noted.

Diagnosis of Surgical Site Infection: Surgical site infection diagnosis was made on the basis of clinical findings and accepted criteria such as presence of purulent discharge from surgical incision, local signs of inflammation, wound dehiscence, abscess on the wound, fevers with wound-related symptoms, and positive culture from the wound secretion. SSI were classified as superficial incisional, deep incisional and organ/space SSI based on the depth and extent of involvement. Where indicated wound swabs were taken under sterile conditions from patients who had suspected infection and submitted for microbiological culture and antibiotic sensitivity testing.

Microbiological Evaluation: Wound swabs for discharge or pus were obtained using sterile techniques from patients with suspected surgical site infection where feasible prior to changing or starting antibiotic therapy. Gram staining, culture, identification of organisms and antibiotic susceptibility was conducted at microbiology laboratory. The microorganisms isolated and their sensitivity pattern was documented and studied.

Surgical Site Infection Risk Factor Assessment: All patients were assessed for potential risk factors of surgical site infection. These encompassed the age, body mass index, parity, anemia, diabetes mellitus, hypertension, nutritional status, length of time in hospital prior to surgery, type of surgery, emergency surgery, route of surgery, duration of surgery, blood loss, receipt of blood transfusion, wound class, use of drain, postoperative hemoglobin level, and length of stay in hospital after surgery. The associations of these variables on surgical site infection were evaluated statistically.

Statistical Analysis

The collected data were analyzed with SPSS version 27.0 and entered into the Microsoft Excel program. Data collected were continuous variables which were presented as mean and standard deviation and categorical variables which were presented as frequency and percentage. The rate for surgical site infection (SSI) was defined as the number of surgical site infections divided by the number of patients who had surgery. The Chi-square test and/or Fisher's exact test were used for categorical variables to assess association between surgical site infection and other risk factors. Continuous data was compared using independent sample t-test/Mann–Whitney U test according to the distribution of the data. A p-value of < 0.05 was used as the criterion for statistical significance.

RESULTS

104 patients who were undergoing major gynecological surgery were included in the study. Of whom, 14 patients had developed surgical site infection, with an overall incidence of surgical site infection of 13.46% and 90 patients did not develop surgical site infection, which was 86.54% of the study population.

Table 1: Risk factors for SSI

When it came to age, the maximum number of patients were of 31-40 years age group (42 patients, 40.38%). But patients older than 50 years showed the highest percentage of SSI wherein 4/14 patients (28.57%) developed SSI. SSI was observed in 5.00% of patients aged 18–30 years, 9.52% of patients aged 31–40 years, and 17.86% of patients aged 41–50 years. The association between age and SSI was not statistically significant (p-value=0.172), but the relationship between age and SSI was found to increase as age increased. Residence of patients: 60 patients (57.69%) were from rural areas and 44 patients (42.31%) were from urban areas. SSI occurred in 8 rural patients (13.33%) and 6 urban patients (13.64%). The rate of occurrence of SSI was nearly equal in both groups and there was no statistically significant association between residence and the occurrence of SSI with a p-value of 1.000. Regarding body mass index, 48 patients (46.15%) had BMI less than 25 kg/m², while 56 patients (53.85%) had BMI ≥25 kg/m². SSI was observed in 3 patients (6.25%) with BMI <25 kg/m² and 11 patients (19.64%) with BMI ≥25 kg/m². This demonstrates that the SSI was more common in the patients with higher BMI. However, this association was not statistically significant (p value 0.081).

Table 2 presents clinical and operative characteristics

Out of all the patients, 84 patients (80.77%) had an elective surgery and 20 patients (19.23%) had an emergency surgery. SSI occurred in 8 elective cases (9.52%) and 6 emergency cases (30.00%). There was a significantly higher rate of SSI in elective surgeries compared to emergency surgeries. This association was statistically significant (p value 0.041). As far as surgery is concerned, 30 patients (28.85%) had surgery in the vagina, and 74 patients (71.15%) had surgery in the abdomen. In 11 patients (14.86%) who had abdominal surgery and 3 patients (10.00%) who had vaginal surgery, SSI was seen. Although SSI was slightly more common after abdominal procedures, the association between route of surgery and SSI was not statistically significant, with a p-value of 0.752. Based on wound class, 60 patients (57.69%) had clean wound, 40 patients (38.46%) had clean-contaminated wound and 4 patients (3.85%) had contaminated wounds. The incidence of SSI was 3 (5.00%) with clean wounds, 9 (22.50%) with clean-contaminated wounds and 2 (50.00%) with contaminated wounds. The incidence of SSI rose with increasing levels of contamination of the wound. This association was statistically significant, having a p value of 0.004. Length of surgery was also determined to be significant. In 74 patients (71.15%) surgery duration was ≤ 120 minutes, 5 of whom had SSI (6.76%). Among 30 patients (28.85%) who had a surgery of a longer duration (>120 minutes), 9 patients (30.00%) had SSI. So, the longer the surgery time, the more significant the association with the development of SSI was (p-value was 0.005).

The incidence and nature of surgical site infections is shown in table 3

Out of 104 patients, 14 patients (13.46%) developed SSI. Of these SSI cases, the most prevalent case type was superficial incisional SSI (64.29%, n=9). Deep incisional SSI was seen in 4 patients (28.57%) and organ/space SSI in 1 patient (7.14%). This indicates that most infections only occurred at the superficial incision site. Among clinical features of SSI, wound discharge or pus was the most common finding, present in 10 patients (71.43%). 6 patients (42.86%) had fever with wound signs and 5 patients (35.71%) had wound gaping. There were 3 patients (21.43%) in which secondary suturing was necessary, which meant there were fewer patients with SSI who needed extra surgical wound care.

Table 4 shows the association of risk factors with SSI

Of the 40 patients who had anemia, 9 (22.50%) had SSI. Among 64 patients (61.54%) without anemia, SSI was seen in 5 patients (7.81%). The p value for the difference in SSI rates between the two groups (anemic and non-anemic) was statistically significant at 0.042. Twenty patients (19.23%) had diabetes mellitus. Six patients (30.00%) had developed SSI compared with 8 patients (9.52%) in the 84 non-diabetic patients. This indicates diabetes had a significant association with the risk of SSI (p value = 0.026). Twenty-five patients (24.04%) needed blood transfusion. Among them, 7 patients (28.00%) developed SSI. Among 79 patients (75.96%) that had not received blood transfusion, 7 patients (8.86%) developed SSI. This association had a p-value of 0.038, which was significant at a statistical level. There were 35 patients (33.65%) who reported using the drains and 8 patients (22.86%) who developed SSI. In 66.35% of the patients (69) who did not use a drain, SSI developed in 6 patients (8.70%). Even though the SSI was higher in the patients who had a drain, the association was not statistically significant, with a p-value of 0.067. In 24.04%, the patients were admitted to the hospital for more than two days before surgery, and 24.00% of these were infected with SSI. SSI was found in 10.13% of patients (8) that had a pre-operative stay of ≤2 days. The SSI rate was higher in patients who stayed for a longer duration in the pre-operative unit (PPO) but this was not statistically significant, p=0.096.

Table 5 displays the microbiological profile of SSI cases

Culture was positive in 85.71% (12 out of 14) of patients and negative in 2 patients (14.29%). In culture positive cases, the most frequent organism cultured was Staphylococcus aureus (4, 33.33%). Escherichia coli came in next with 3 cases (25.00%). Klebsiella species and Pseudomonas aeruginosa were each detected in 2 cases (16.67%) and mixed bacterial growth was detected in 1 case (8.33%).

Table 1: Sociodemographic characteristics and association with SSI

Variable	Category	Total n (%)	SSI Present n (%)	SSI Absent n (%)	p-value
Age group	18–30 years	20 (19.23%)	1 (5.00%)	19 (95.00%)	0.172
	31–40 years	42 (40.38%)	4 (9.52%)	38 (90.48%)	
	41–50 years	28 (26.92%)	5 (17.86%)	23 (82.14%)	
	>50 years	14 (13.46%)	4 (28.57%)	10 (71.43%)	
Residence	Rural	60 (57.69%)	8 (13.33%)	52 (86.67%)	1.000
	Urban	44 (42.31%)	6 (13.64%)	38 (86.36%)	
BMI	<25 kg/m²	48 (46.15%)	3 (6.25%)	45 (93.75%)	0.081
	≥25 kg/m²	56 (53.85%)	11 (19.64%)	45 (80.36%)	

Table 2: Clinical and operative characteristics

Variable	Category	Total n (%)	SSI Present n (%)	SSI Absent n (%)	p-value
Type of admission	Elective	84 (80.77%)	8 (9.52%)	76 (90.48%)	0.041
	Emergency	20 (19.23%)	6 (30.00%)	14 (70.00%)	
Route of surgery	Abdominal	74 (71.15%)	11 (14.86%)	63 (85.14%)	0.752
	Vaginal	30 (28.85%)	3 (10.00%)	27 (90.00%)	
Wound class	Clean	60 (57.69%)	3 (5.00%)	57 (95.00%)	0.004
	Clean-contaminated	40 (38.46%)	9 (22.50%)	31 (77.50%)	
	Contaminated	4 (3.85%)	2 (50.00%)	2 (50.00%)	
Duration of surgery	≤120 min	74 (71.15%)	5 (6.76%)	69 (93.24%)	0.005
	>120 min	30 (28.85%)	9 (30.00%)	21 (70.00%)	

Table 3: Incidence and type of surgical site infection

Parameter	Frequency	Percentage
Total patients studied	104	100.00%
SSI present	14	13.46%
SSI absent	90	86.54%
Superficial incisional SSI	9	64.29%*
Deep incisional SSI	4	28.57%*
Organ/space SSI	1	7.14%*
Wound discharge/pus	10	71.43%*
Wound gaping	5	35.71%*
Fever with wound signs	6	42.86%*
Secondary suturing required	3	21.43%*

Percentage calculated among SSI cases, n=14.

Table 4: Association of risk factors with SSI

Risk factor	Category	Total n (%)	SSI Present n (%)	SSI Absent n (%)	p-value
Anemia	Present	40 (38.46%)	9 (22.50%)	31 (77.50%)	0.042
	Absent	64 (61.54%)	5 (7.81%)	59 (92.19%)	
Diabetes mellitus	Present	20 (19.23%)	6 (30.00%)	14 (70.00%)	0.026
	Absent	84 (80.77%)	8 (9.52%)	76 (90.48%)	
Blood transfusion	Yes	25 (24.04%)	7 (28.00%)	18 (72.00%)	0.038
	No	79 (75.96%)	7 (8.86%)	72 (91.14%)	
Drain usage	Yes	35 (33.65%)	8 (22.86%)	27 (77.14%)	0.067
	No	69 (66.35%)	6 (8.70%)	63 (91.30%)	
Preoperative stay >2 days	Yes	25 (24.04%)	6 (24.00%)	19 (76.00%)	0.096
	No	79 (75.96%)	8 (10.13%)	71 (89.87%)	

Table 5: Microbiological profile of SSI cases

Organism isolated	Frequency	Percentage
Culture positive	12	85.71%
No growth	2	14.29%
Staphylococcus aureus	4	33.33%*
Escherichia coli	3	25.00%*
Klebsiella species	2	16.67%*
Pseudomonas aeruginosa	2	16.67%*
Mixed bacterial growth	1	8.33%*

Percentage calculated among culture-positive cases, n=12.

DISCUSSION

The overall SSI incidence in the present study was 14/104 patients or 13.46%. The incidence is also higher than that reported by Pathak et al. (2017) who reported 92 out of 1173 patients having SSI, giving an overall incidence of 7.84%, and specifically for gynecological surgeries, they had an incidence of 10.37%. This is likely due to the inclusion of major gynecological surgery, emergency surgery, clean contaminated wounds and patients with co-morbidities (anemia, diabetes mellitus and raised BMI) in the present study, which may increase the incidence in this high-risk group compared to other surgical specialties that had a lower incidence.[7] SSI was found to be higher with age (no statistical significance, p=0.172) with highest prevalence in patients aged more than 50 years (28.57%) and lowest in patients aged 18-30 years (5.00%). This discovery is similar to that of Reddy et al. (2025) who found that the women aged >35 years contributed 46.30% of the SSI cases in their study. The rural and urban residence had almost equal SSI rate in the present study (13.33% vs. 13.64%) but Reddy et al. reported that the role of residence varied as the rate of SSI was higher in rural women (75.60%).[8] In the present study, BMI ≥25 kg/m² showed a significant trend in occurrence of SSI compared with BMI <25 kg/m² with 11 patients (19.64%) versus 3 patients (6.25%) respectively (p=0.081). Atibovonsuk (2020) also noted a higher incidence of SSI (9.76%) following abdominal hysterectomy and found BMI ≥23 kg/m² to be a significant risk factor for superficial incisional SSI (p=0.021). This is consistent with the reported hypothesis that the increased BMI may lead to increased risk of SSI because of thicker subcutaneous tissue, decreased tissue oxygenation, longer operative handling time and challenges with wound hygiene maintenance.[9] In the present study, there was a significant association between emergency surgery and SSI, with 6 of 20 emergency surgery patients (30.00%) developing SSI versus 8 of 84 elective surgery patients (9.52%) (p=0.041). The overall SSI rate among obstetric and gynecologic surgical procedures was reported as 11.40% by Amenu et al (2011) and it was also observed that wound contamination was more frequently seen in infected wounds (64.80%) compared to contaminated and dirty wounds (35.20%). It was thought that the greater SSI rate in the emergency surgeries in the current study could be attributed to inadequate time for optimizing patients before surgery, increased risk of contamination, anemia, blood loss, and urgency of surgery.[10] In the present study, the rate of SSI was slightly higher after abdominal surgery (11/74, 14.86%) than after vaginal surgery (3/30, 10.00%) and the difference was not significant (p=0.752). By contrast, Goma et al. (2022) reported an overall SSI incidence of 4.67% after gynecological surgery and 7.57% after hysterectomy, and that patients with diabetes, obesity, high parity, heavy blood loss and surgeries lasting longer than 90 minutes were more likely to develop SSI (p<0.01). The higher abdominal SSI rate in the current study could be attributable to the larger incisions, more tissue handling, and greater exposure of the wound with the open procedures.[11] In the current study, wound class and the duration of surgery were significantly correlated with SSI. Here we found a statistically significant association between SSI and clean wounds (5.00%), clean-contaminated wounds (22.50%) and contaminated wounds (50.00%). The same was true for surgery lasting >120 minutes, with a higher rate of SSI of 30.00%, than surgery ≤120 minutes (6.76%) (p=0.005). These findings align with those of Tserenpuntsag et al. (2023) who found that wound contamination and a longer procedure were important independent risk factors for SSI following abdominal hysterectomy. This suggests that the greater the contamination of wounds and the longer the time of operative exposure, the higher the risk of microbial penetration and postoperative infection is.[12] As for the type of SSI, the present study revealed that superficial incisional SSI was the most prevalent type, accounting for 9 of 14 SSI cases (64.29%), deep incisional SSI cases were 4 (28.57%) and organ/space SSI cases were 1 (7.14%). This is comparable to the results of Nikhil et al (2022) who found SSI in 6 of 50 patients (12.00%) after LH, superficial SSI in 4 (8.00%), deep SSI in 2 (4.00%) and no organ/space infection. Superficial incisional infection accounted for the bulk of infections in both studies, highlighting the fact that most SSIs associated with gynecological surgery are confined to the skin and subcutaneous tissues, if diagnosed and treated in a timely manner.[13] In the present study, the factors significantly associated with SSI were patient related risk factors and perioperative risk factors, such as anaemia, diabetes mellitus and blood transfusion. The incidence rate of SSI was higher in anemic patients (22.50%) than in non-anemic patients (7.81%) (p=0.042), diabetic patients (30.00%) than in non-diabetic patients (9.52%) (p=0.026) and patients receiving blood transfusion (28.00%) than in those not receiving blood transfusion (8.86%) (p=0.038). These results are similar to Liu et al., (2025), who established blood transfusion, obesity, diabetes, presence of tumor and tobacco use as risk factors for SSI following hysterectomy. The present study revealed that higher SSI rate was associated with drain usage and preoperative stay >2 days, which was 22.86% and 24.00%, respectively, but these were not statistically significant.[14] In the present study, 85.71% of 14 SSI cases were microbiologically cultured and 2 cases were negative. The most frequently isolated organism was Staphylococcus aureus (4 cases (33.33%)) followed by Escherichia coli (3 cases (25.00%)) and Klebsiella species (2 cases (16.67%)) and Pseudomonas aeruginosa (2 cases (16.67%)) and mixed growth (1 case (8.33%)) The results obtained are in close agreement with those of Fultariya et al. (2023) which indicated that 90 out of 106 wound swabs were culture-positive, with Staphylococcus aureus (28.00%) being the predominant organism followed by E. coli and other gram-negative organisms. This similarity suggests that gram-positive skin flora and gram-negative enteric organisms both play an important role in SSI following obstetric and gynecological procedures.[15]

CONCLUSION

The present study revealed that surgical site infection was seen in 13.46% of patients undergoing major gynecological surgeries. The superficial incisional

SSIs were the most common infections, and the most frequent clinical presentation was wound discharge. Emergency surgery, contaminated wound class, the length of surgery, anemia, diabetes mellitus and blood transfusion were significantly associated with SSI. S. aureus was the most prevalent organism from infected wounds. Preoperative optimization, meticulous aseptics, proper antibiotic coverage and frequent postoperative wound checks are helpful to minimize the morbidity associated with SSI.

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