

Research Article**Postoperative Sepsis: A Clinical Audit of Obstetrics and Gynecological Cases****Dr Sushma Rachel S¹, Dr Joylene Diana D'Almeida²**¹Postgraduate, Department of Obstetrics and Gynecology, Father Muller Medical College, Mangalore

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²Associate Professor, Department of Obstetrics and Gynecology, Father Muller Medical College, Mangalore**Abstract****Background:**

Postoperative sepsis is a major cause of illness and death after major surgeries, especially gynecological procedures, even with improvements in cleanliness and antibiotic use. This audit aimed to assess how often postoperative sepsis occurs, the types of microbes involved, and the risk factors linked to it in a tertiary care hospital.

Methods:

We conducted a retrospective audit from July 2017 to September 2017, including all patients who underwent obstetric or gynecological surgeries. We collected data on the type of procedure, occurrence of sepsis, results from microbiological tests, and risk factors. Sepsis was defined as an infection related to systemic inflammatory response syndrome (SIRS) criteria.

Results:

A total of 528 patients underwent surgery; 307 cesarean sections and 221 gynecological surgeries. Postoperative sepsis occurred in 105 cases, with an incidence of 19.8%. The highest rates were seen in abdominal hysterectomy cases (26%) and vaginal hysterectomy cases at (31.5%). The lowest rates were in laparoscopic surgeries (12%). Catheter-associated urinary tract infection (CAUTI) was the most common postoperative infection (64%), followed by surgical site infection (SSI) with an incidence of 26%. The main microorganisms found were Klebsiella species, Escherichia coli, Enterococcus and MRSA.

Conclusion:

Postoperative sepsis was more commonly seen in gynecological surgeries, especially open procedures. The high rate of CAUTI emphasizes the need for careful catheter care, proper use of antibiotics during surgery, and ongoing infection monitoring to decrease sepsis cases.

Keywords: Postoperative sepsis, gynecological surgery, cesarean section, surgical site infection, CAUTI, audit.

Introduction

Postoperative sepsis is a major cause for surgical associated morbidity and mortality. It is still one of the main preventable causes of complications and deaths after surgery around the world[1]. Though the incidence has not decreased over the past years, the mortality due to sepsis has shown a downward trend due to early detection and improvements in antibiotic treatment[2]. The use of preventive antibiotics has significantly improved results, but infections after surgery still place a strain on healthcare resources[3]. Several biochemical and genetic markers may allow early diagnosis and prompt treatment.

Sepsis is a body-wide inflammatory response to infection and is defined by at least two of the following: a temperature over 38°C or under 36°C, a heart rate over 90 beats per minute, a breathing rate over 20 per minute, or an abnormal white blood cell count (over 12,000 or under 4,000/mm³)[4]. Severe sepsis includes organ failure, while septic shock is sepsis accompanied by low blood pressure that does not improve with fluid replacement[5].

SIRS is defined by the presence of two or more of the above mentioned signs. Sepsis is SIRS plus clinical suspicion of infection. Severe sepsis is defined by the presence of sepsis with evidence of organ dysfunction. Septic shock is sepsis with hypotension refractory to volume resuscitation. Multiorgan failure is condition with more two organ failures.

This clinical audit aimed to evaluate the extent and features of postoperative sepsis in obstetric and gynecologic surgeries at a tertiary center over three months period. Key goals were to identify the types of infections, the microbes involved, and the risk factors related to the patients or procedures.

Materials and Methods

Study Design and Period

A retrospective clinical audit was conducted from July to September 2017 in the Department of Obstetrics and Gynecology at Father Muller Medical College, Mangalore which is a tertiary care centre as well as a teaching hospital.

Study Population

Inclusion criteria: All patients who underwent cesarean sections, hysterectomies (either abdominal or vaginal), laparotomies, myomectomies, and laparoscopic surgeries were included.

Exclusion criteria: Patients with pre-existing infections before surgery were not included.

Data Collection

Patient records were reviewed for demographic information, type of surgery, postoperative outcomes, microbiology reports, and use of antibiotics. Sepsis was defined according to the Surviving Sepsis Campaign guidelines (2016)[6].

Data Analysis

Data were entered into Microsoft Excel and presented as frequencies and percentages. Microbiological isolates were summarized, and patterns were compared among different surgical procedures.

Results

1. Overall Incidence

Out of **528** operated patients, postoperative sepsis occurred in **105 (19.8%)**.

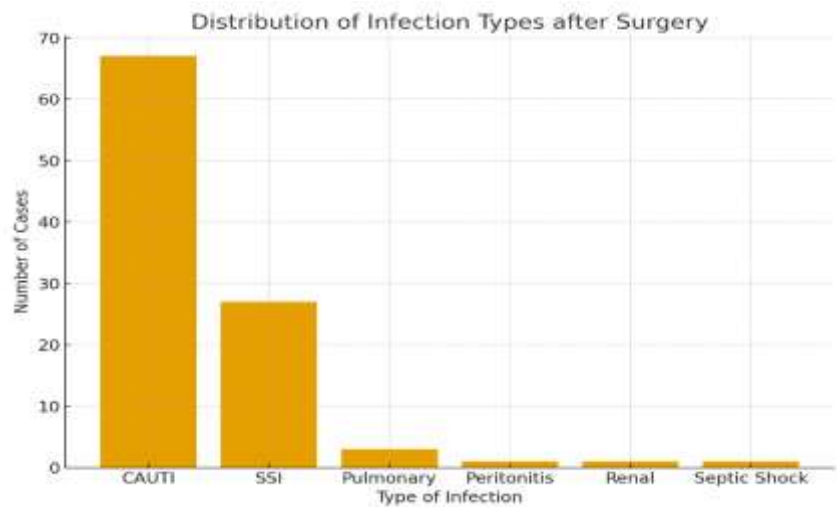
Table 1. Distribution of Postoperative Sepsis Cases by type of surgery

Type of Surgery	Total Cases	Sepsis Cases	Incidence (%)
Cesarean Section	307	47	15.3
Abdominal Hysterectomy	92	24	26.0
Vaginal Hysterectomy	38	12	31.5
Myomectomy	17	3	18.0
Laparotomy	33	6	18.0
Laparoscopic Surgeries	41	5	12.0
Total	528	105	19.8

2. Type of Infection

Among all postoperative sepsis cases, **CAUTI** was the most common infection (64%), followed by **SSI** (26%) and **pulmonary** infections (3%).

Figure 1. Distribution of Infection Types after Surgery



3. Microbiological Profile

The predominant isolates included *Klebsiella* (20%), *E. coli* (19%), *Enterococcus* (13%), and *MRSA* (8%). Mixed infections were common, particularly in gynecological surgeries.

Table 2. Bacterial Isolates from Postoperative Sepsis Cases

Pathogen	No. of Cases	Percentage (%)
<i>Klebsiella</i> spp.	20	19.0
<i>E. coli</i>	19	18.1
<i>Enterococcus</i> spp.	13	12.4
<i>MRSA</i>	8	7.6
<i>CONS</i>	6	5.7
<i>Acinetobacter</i> spp.	5	4.8
<i>Pseudomonas</i> spp.	2	1.9
<i>Candida</i> spp.	1	1.0
<i>Citrobacter/Morganella</i> spp.	2	1.9

4. Distribution of Sepsis by Procedure

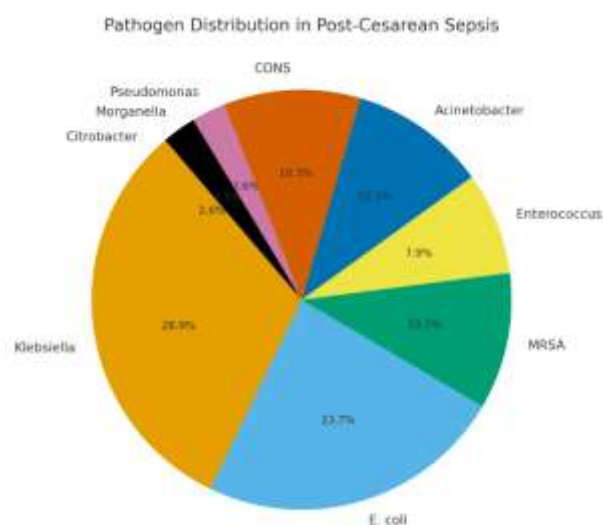
Table 3. Post-Cesarean Section Sepsis Profile

Complication	Emergency LSCS	Elective LSCS	Total
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SSI	2	3	5
CAUTI	26	12	38
Pulmonary	1	0	1
Peritonitis	1	0	1
Septic Shock	1	0	1
Renal	1	0	1

As shown above, in post cesarean cases CAUTI was the most common (n=38) followed by SSI (n=5).

Figure 2. Pathogen Distribution in Post-Cesarean Sepsis



As seen in figure 2, Klebsiella species (28.9%) were the most commonly isolated pathogens followed by E.coli (23.7%), MRSA, CONS and Acinetobacter (10.5% each).

Table 4. Sepsis Following Abdominal and Vaginal Hysterectomies

Procedure	Total Cases	Sepsis Cases	SSI	CAUTI	Pulmonary	Common Pathogens
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Abdominal Hysterectomy	92	24	3	20	1	<i>E. coli, Enterococcus</i>
Vaginal Hysterectomy	38	12	1	11	0	<i>Klebsiella, E. coli</i>

In our study, in abdominal and vaginal hysterectomies sepsis was seen in 26% (n=24) and 31% (n=12) of cases respectively. Again, CAUTI was the most common infection with 21.7% (n=20) in abdominal hysterectomy cases and 28% (n=11) in vaginal hysterectomy cases. Pulmonary complication was seen in one case post abdominal hysterectomy.

Post myomectomy cases:

Table 5. Post myomectomy sepsis profile

	No of cases (%)	Most common Pathogen isolated
SSI	2 (12%)	Klebsiella, Enterococcus
CAUTI	1 (6%)	E.coli

In 17 myomectomy cases, postoperative sepsis was seen in 3(18%). SSI was seen in 2 (12%) and CAUTI in 1 case (6%).

Post Laparotomy sepsis

Table 6. Post Laparotomy sepsis profile

	No of cases (%)	Most commonly isolated pathogen
SSI	1	MRSA, CONS, Enterococcus
CAUTI	4	Klebsiella sp.
Pulmonary	1	

Out of 33 post laparotomy cases, sepsis was seen in 6 cases (18%). CAUTI was the most common type of infection seen in 4 cases (12%) with Klebsiella species being the most commonly isolated microbe.

Post laparoscopic surgeries

Table 7. Post laparoscopic sepsis profile

	No of cases (%)
SSI	1 (2%)
CAUTI	4 (10%)

In our study, in 41 cases of Post laparoscopic surgeries, 5 (12%) developed sepsis. CAUTI was the most common infection in this group too (10%).

5. Risk Factors

Host-related factors: obesity (BMI>30), diabetes mellitus, anemia, malnutrition, smoking, and prolonged preoperative hospital stay were major contributors.

Surgical factors: emergency procedures, blood loss >500 mL, transfusion, prolonged duration, and inadequate prophylaxis increased the risk of sepsis.

Table 8. Common Risk Factors in Postoperative Sepsis

Risk Factor	Frequency (%)
Diabetes mellitus / GDM	15
PROM / Chorioamnionitis	10
Hypertensive disorders (PIH, PE, eclampsia)	11
Anemia / Malnutrition	18
Obesity (BMI >30)	12

Discussion

This audit showed that nearly one-fifth of all surgical patients developed postoperative sepsis. This rate is similar to study reports from other tertiary centers in India [7,8]. The high occurrence of CAUTI highlights the need for early removal and catheter-free care after surgery whenever possible. Klebsiella and E. coli were the most common isolates, which aligns with previous microbiological studies. [9-11]

In our study gynecological surgeries, especially open abdominal hysterectomy, had the highest sepsis rates. This is likely due to more exposure and tissue damage compared to laparoscopic surgeries. The 31.5% rate in vaginal hysterectomies could be linked to the diverse vaginal bacteria and the risk of contamination. [12]

Emergency cesarean sections had higher infection rates than elective ones. This might be due to poor preoperative preparation and longer periods of ruptured membranes. Similar patterns were found in studies by Shah and Mehta [13,14].

In present study, less incidence of sepsis (12%) was in laparoscopic procedures. The lesser incidence can be attributed to smaller area of exposure to external environment.

Antibiotic management is crucial. Even with prophylactic measures, the patterns of resistance, especially with MRSA and Klebsiella, highlight the need for customized local antibiograms.[15]. Improving infection control, maintaining surgical cleanliness, and removing indwelling catheters early are important preventive steps [16,17]. Recognising risk factors preoperatively and closely monitoring the patients at high risk of sepsis peri-operatively can help reduce the morbidity due to sepsis.

Conclusion

Postoperative sepsis continues to be a significant cause for morbidity in obstetric and gynecologic practice. The audit points out that CAUTI is the most common infection and Klebsiella and E. coli are the main pathogens. Ongoing monitoring, sensible antibiotic use, strict cleanliness, and prompt intervention are vital for lowering postoperative sepsis rates.

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