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Prevalence of operative complications in obstetric and gynecological surgeries requiring interventions by a general surgeon and their associated risk factors: A retrospective study in a tertiary care hospital in Vindhya region

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ABSTRACT

Background: Surgical complications can occur in any surgery despite the best possible efforts, thereby affecting the prognosis. Gynecological and obstetric surgeries also result in some complications which require interventions by a general surgeon. These complications can be either causing hemodynamic instability, urinary tract injury, gastrointestinal tract injury, or infections. **Aims and Objectives:** The present study designed to identify and classify the various complication in obstetric and gynecological surgeries requiring interventions by a general surgeon and to correlate the various risk factors that predispose to these complications. **Materials and Methods:** The present retrospective study was conducted in the Department of Obstetrics and Gynecology and Department of Surgery, Shyam Shah Medical College and associated hospitals, Rewa, M.P., for 6 months from January 2021 to June 2021. Gynecological and obstetric surgeries resulting in complications requiring surgical intervention were identified and classified based on patients' demographic characteristics, comorbidities, and type of complications. **Results:** A total of 1356 cases undergoing an obstetrical or gynecological procedure in the department of obstetrics and gynecology were studied. About 2.14% of the patients had some kind of intraoperative or post-operative complications, which required intervention by a general surgeon. The mean age of females having complications was 37.17 ± 3.71 years. Overall the most common complication was surgical site infection with 48% of the total cases. **Conclusion:** In this present study, the incidence of surgical complications in obstetrical and gynecological surgeries, which is associated with higher morbidity postoperatively. These complications can be prevented by proper vigilance and surgical technique in high-risk patients.

Key words: General surgery; Surgical complications; Surgical site infections

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INTRODUCTION

Surgical complications in the form of iatrogenic injuries to the gastrointestinal or urogenital tract, infections, and hemodynamic instability can occur in any gynecological or obstetrical surgery. These complications can arise either intraoperatively or postoperatively. Most of these complications can be managed by the gynecologist alone; however, few cases require the intervention of a surgeon. The close embryonic development and anatomic proximity of the urogenital and gastrointestinal tract predispose to injury during surgical procedures in the female pelvis.

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Gynecological procedures are estimated to account for 75% of iatrogenic urinary tract injuries.[1,2] Urinary tract injuries can complicate almost 0.2–1% of gynecological procedures.[1,3] Hysterectomy, salpingectomy, cystectomy, and lower segment Cesarean sections (LSCSs) are the most common gynecological and obstetrical surgical procedures.[4] These procedures can be done by abdominal or vaginal routes, open surgery, or less invasive techniques such as laparoscopy and robotic surgery. Intraoperative complications can be treated right away if they are detected early enough during the procedure. As a result, a thorough understanding of pelvic anatomy is a must for the surgeon to detect and manage these complications, thereby, minimizing the risk.

A post-operative complication might occur at any point after the procedure, which includes surgical site infection (SSI), urinary tract infection, upper respiratory tract infection, abdominal distension, and fever. The most prevalent surgical complication in India is SSI, which accounts for 0.5% to 15% of all post-operative complications.[5] It complicates 11.8 out of 100 surgical procedures in low- and middle-income countries, according to the World Health Organization.[6] The variables that cause these undesirable consequences could be related to the patient or the surgeon. Ascites, inflamed bowel, distorted anatomy, previous surgery, endometriosis, carcinomas, and pelvic inflammatory disease can all enhance the risk of complications. Age, comorbidities, weight, compliance, surgical hygiene, nutrition, and functional performance may all be directly or indirectly causal. Complications can also be caused by the sterility of the operating room and operating crew, aseptic circumstances, and surgical errors.[5] Evidence suggests that a patient's outcome is negatively influenced by the delayed diagnosis of these complications.[6] The urgency of early diagnosis is emphasized even more because a delay in detecting a procedural complication could have medicolegal ramifications.[7] In this study, we discuss the clinical presentations, symptoms, risk factors, and the various types of surgical complications that can occur following any gynecological or obstetrical surgery. Furthermore, this study aimed at identifying the various factors which predicted the risk of occurrence of complications in patients undergoing gynecological and obstetrical surgeries. This knowledge before the procedure can help in risk stratification of the patients and also guides the operating surgeon in judicious and meticulous management of such patients to avoid these complications.

Aims and objectives

The aims of this study were to estimate the prevalence of operative complications during obstetrical and gynecological surgeries and to identify the causes, risk factors, and the type of complications.

MATERIALS AND METHODS

The present retrospective study was done in the Department of Obstetrics and Gynecology and Department of Surgery, Shyam Shah Medical College and associated hospitals, Rewa, M.P., for 6 months from January 2021 to June 2021. After obtaining ethical clearance and waiver of consent from the Institutional Ethical Committee and respective departments, departmental records were retrieved and patients undergoing any form of gynecological or obstetrical surgical procedure were studied. Details of the patients requiring any form of intervention by a general surgeon during or after the surgery were noted. All the 1356 patients undergoing gynecological or obstetrical surgical procedure during the above-mentioned period were included in the present study, out of which 29 patients required intervention by a general surgeon due to complications during the procedure. The cases were classified based on age, parity, type of complications, type of procedure, associated comorbidities, and post-operative hospital stay. Data were noted in tabulated form and analysis of data was done using the Statistical Package for the Social Sciences ver. 22 (Chicago), IL. Frequency counts (percentage) were used to express categorical data. Statistical correlation was done between categorical variables and the correlation was calculated using the Chi-square test. P-value <0.05 was considered as statistically significant or positive correlation between the variable and the occurrence of surgical complications requiring intervention by a general surgeon.

RESULTS

The present study included 1356 patients operated in the Department of Obstetrics and Gynecology during the 6-month study period. All the patients belonged to the age group between 21 and 72 years. About 2.14% (29/1356) cases had intraoperative or post-operative complications, which required general surgical intervention. The most common age group having surgical complications in our study was 21–30 years with 37.93% (11/29), followed by 31–40 years with 31.03% (9/29) cases. The mean age with complications was 37.17±3.71 years (Figure 1).

The complications were divided into intraoperative and post-operative. Intraoperative complications included bladder, ureteric, and intestinal injuries (Figure 2), whereas post-operative complications included SSIs and post-operative intestinal obstruction. The most common complication requiring surgical intervention was SSI in 48.3% (14/29) of the cases followed by bladder injury in 27.5% (8/29) cases (Table 1).

Most of the surgical complications were seen with LSCS with 44.8% (13/29) cases, whereas elective abdominal hysterectomy with or without bilateral salpingo-oophorectomy (BSO) accounted for 31.04% (9/29) of the total cases. Emergency hysterectomy performed for uterine perforation or incarcerated placenta resulting in complications accounted for 13.8% (4/29) cases. The most common complication following LSCS was SSI with 11 out of the total 13 LSCS cases (84.61%). In total abdominal hysterectomy TAH (with or without BSO), the most common complications were bladder injury and SSI with three cases each out of total nine total abdominal hysterectomy cases (33.33% each) (Table 2).

In the present study, there was a significant statistical correlation between parity and post-operative duration of hospital stay of the patients and the occurrence of complications, with P<0.05. However, there was no statistical correlation between the age of the patients, the presence of comorbidities, and previous history of obstetrical or gynecological surgeries (Table 3).

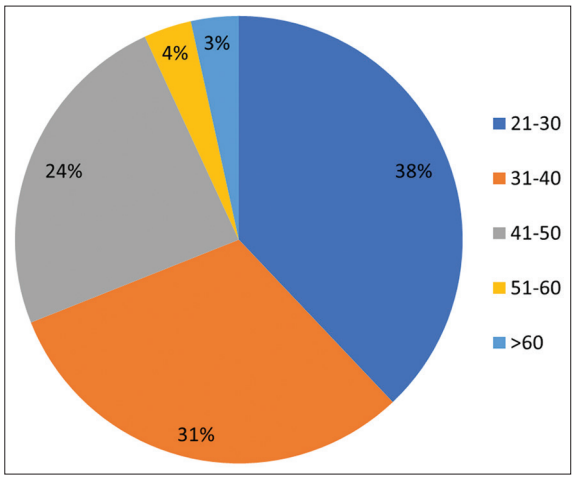

Figure 1: Age-group-wise distribution of cases requiring surgical interventions

Figure 2: A 34-year-old female, operated for lower segment cesarean section showing iatrogenic perforated intestinal segment, managed with primary repair of bowel by general surgeon

DISCUSSION

Every surgeon strives to execute procedures in the most efficient manner possible, free of complications, or harm

Table 1: Types and frequency of general surgical complications following gynecological and obstetrical surgeries

Complications	Number of patients	Percentage
Intraoperative complications		
Bladder injury	8	27.5%
Intestinal injury	2	6.9%
Ureter injury	1	3.5%
Post-operative complications		
Surgical site infections	14	48.3%
Intestinal obstruction	4	13.8%
Total	29	100

Table 2: Type and frequency of gynecological and obstetric surgeries associated with complications

Type of procedure	Number of cases	Percentage
Lower segment C-section	13	44.8
Elective TAH* with BSO^{+}	3	10.4
Elective TAH* without BSO^{+}	6	20.6
Exploratory laparotomy	3	10.4
Emergency hysterectomy	4	13.8
Total	29	100.00

*Total abdominal hysterectomy. $^{+}$Bilateral Salpingo-oophorectomy

Table 3: Statistical association between various parameters and occurrence of complications calculated using Chi-square test

Parameter		P-value
Age (mean ± SD)	37.17±3.71 years	0.763
	Number of cases	
Parity		0.014
P1	5	
P2	11	
P3	7	
>P4	6	
Comorbidities		0.852
Present	15	
Absent	14	
History of the previous obstetrical/gynecological surgery		0.852
Present	14	
Absent	15	
Pre-operative duration of hospital stay (days)		0.045
<10	8	
11–15	14	
16–20	6	
>20	1	

Table 4: Comparison of frequency of complications between various studies

Authors	SSI	Gastrointestinal complications	Urogenital injury
Bahadur et al.[9]	10.28%	0.25%	0.77%
Ortiz-Martínez et al.[4]	1.52%	0.34%	-
Barbosa and Garnica[10]	2.2%	-	-
Snehal et al.[11]	10.35%	-	-
Pathak et al.[12]	10.3%	-	-
Present study	1.03% (14/1356)	0.44% (6/1356)	0.66% (9/1356)

Table 5: Statistical association of various factors in similar studies

Authors	Age	Parity	Co-morbidities	Previous surgeries	Duration of post-operative stay
Bahadur et al.[9]	Yes	Yes	No	No	Yes
Gevariya et al.[13]	No	No	-	-	-
Barbosa and Garnica[10]	-	-	-	No	-
Brummer TH et al.[14]	-	-	-	No	-
Present Study	No	Yes	No	No	Yes

to the patient; but, despite their best efforts, complications can occur in any surgery, impacting the prognosis. In the present study, a total of 1356 patients undergoing any gynecological or obstetric surgery during the specified study duration were included in the study. The major types of surgeries included were elective hysterectomy with or without BSO (by abdominal or vaginal route), emergency hysterectomy (by abdominal route), LSCS, and exploratory laparotomy. The mean age of women undergoing the above-mentioned study was 37.17±3.71 years. Overall the prevalence of complications that required intervention by a general surgeon was 2.14% (29 out of a total of 1356 surgeries). The prevalence of general surgical complications associated with gynecological and obstetrical surgical procedures was similar in the studies done by Ortiz-Martínez et al.,[4] and Erekson et al.,[8] with a prevalence of 3.8% and 3.7%, respectively. However, Bahadur et al.,[9] reported a much higher prevalence of these complications in their study with 24.16%. The difference in these results may be because they included all the minor and major complications following obstetrical and gynecological procedures ranging from fever, respiratory infections, shock, and surgical complications, whereas, in the present study, only complications (intraoperative or post-operative) that required intervention by a general surgeon were included in the study. The most common surgical complication encountered in the present study was SSI with 1.03% followed by urogenital injuries in 0.66% of the total 1356 cases. This aligns with the results observed by Ortiz-Martínez et al.,[4] and Barbosa and Garnica[10] with incidence of SSI as 1.52% and 2.2%, respectively. However, some previous researchers[9,11,12] found a higher rate of these SSI in comparison to our study. Similarly, the incidence of urogenital surgeries observed in our study was comparable to the results of study done by Bahadur et al.[9] The incidence of gastrointestinal complications in our study was 0.44%, which aligns with the results of Bahadur et al.,[9] and Ortiz-Martínez et al.,[4] with 0.25% and 0.34%, respectively (Table 4).

Our study found a significant statistical correlation between the parity of the patients and the pre-operative duration of hospital stay, whereas the age of the patients, the presence of comorbidities, and the type of surgery did not show any significant statistical correlation. Age and parity had no relationship with surgical complications, according to Gevariya et al.,[13] Barbosa and Garnica,[10] and Brummer et al.,[14] found no link between surgical complications and previous abdominal surgeries, which are consistent with our findings. The pre-operative hospital stay duration was also longer in patients with complications compared to those without, which is in accordance with the results of Bahadur et al.,[9] (Table 5).

Limitations of the study

The drawback of the current study was the hidden prevalence of these complications, as some of the minor complications (such as iatrogenic injury) can be managed by the gynecological surgeons themselves, without the requiring the consultation of general surgeon. Also, few of the cases might be unnoticed due to loss of follow-up of the patients post discharge from the hospital.

CONCLUSION

The present study concluded that the percentage of cases with intraoperative or post-operative complications is 2.14%. Out of these, most of the complications were avoidable and preventable with proper precautions and pre-operative evaluation of the patients. SSI was the most common cause of post-operative morbidity, emphasizing the relevance of hygiene. Independent variables such as parity and the length of stay in the hospital before surgery were found to be strongly linked with these problems,

indicating the need for extra caution during surgical procedures in these patients.

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Authors' Contributions:
SS- Concept and design of the study, prepared first draft of manuscript; **APS-** Interpreted the results; reviewed the literature and manuscript preparation; **AC-** Concept, coordination, preparation of manuscript and revision of the manuscript; **AP-** Preparation of manuscript, statistical analysis and interpretation and revision of the manuscript.

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