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ORIGINAL ARTICLE

Outcomes of Emergency Laparotomy in Pregnant and Postpartum Patients

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ABSTRACT

Background: Emergency laparotomy in pregnancy and the postpartum period is a rare but dangerous surgical procedure with high morbidity and mortality of both the mother and the fetus. The timely surgical decision-making is usually complicated by physiological changes of pregnancy, diagnostic uncertainty, and delayed presentation, especially in resource-limited settings.
Objective: To assess the indications, maternal outcomes, fetal outcomes and factors that can lead to adverse outcomes in case of emergency laparotomy during pregnancy and postpartum patients.
Methods: A retrospective observational study was undertaken in a Khalifa Gul Nawaz Teaching Hospital Bannu, Pakistan and analyzed medical records of patients between March 2023 and August 2023. Pregnant women and postpartum patients (six weeks after delivery) who had an emergency laparotomy were all included. Descriptive and inferential statistics were used to analyze data on demographics, indications of surgery, perioperative findings, maternal complications, and fetal results.
Results: There were 96 patients (58 (60.4) of them pregnant and 38 (39.6) postpartum). The most frequent presenting sign was acute appendicitis in the pregnant patients, with intestinal obstruction and puerperal sepsis being the most common in the postpartum patients. There were 29 patients with maternal complications (30.2), the most common being surgical site infection and sepsis. Maternal mortality was 4.2%. Adverse fetal outcomes were seen in 31.0% of pregnant patients and mainly preterm birth and fetal distress. Better outcomes were linked with early surgical intervention and a healthy mother condition.
Conclusion: The use of emergency laparotomy in pregnant and postpartum patients poses huge maternal and fetal risks, especially when it is late and when the fetus develops sepsis. The diagnosis, early surgery and multidisciplinary approach are important to achieve better results in this population that is vulnerable.
Keywords: Laparotomy in case of emergency; Pregnancy; Post partum period; Maternal and fetal outcomes.

INTRODUCTION

Emergency laparotomy in the cases of pregnancy and postpartum is a complicated clinical situation with significant maternal and fetal risks. Abdominal non-obstetric surgery is very uncommon in pregnant women, but emergency laparotomy is inevitable in some life-threatening diseases and is a significant contributor to maternal morbidity and mortality in case of undiagnosis or unaddressed diagnosis[1]. Two-way accountability of preserving both fetal and maternal health makes it especially difficult to make surgical decisions in this group.

Pregnancy-associated physiological alterations such as the elevated blood volume, alteration of gastrointestinal motility, the displacement of abdominal organs by the gravid uterus, and leukocytosis of pregnancy usually mask traditional symptoms of acute abdominal disease[2]. Such alterations may result in unusual manifestations, diagnostic confusion, and delayed surgical intervention hence aggravating outcome. Also, issues of fetal safety can also be another reason of reluctance to timely operative management.

The signs of emergency laparotomy in pregnant women are varied, they can be appendicitis, intestinal obstruction, bowel perforation, volvulus, trauma, and difficulties associated with the previous abdominal operations[3]. Appendicitis is the most prevalent non obstetric surgical emergency in pregnancy, although because of inspecification in symptoms, and the overlap with obstetric complaints, it is often diagnosed late[4]. Late intervention raises chances of perforation, sepsis and poor fetal outcomes.

During the postpartum, emergency laparotomy is mostly required due to puerperal sepsis, secondary postpartum hemorrhage, uterine rupture, and bowel injury[5]. Even though the lack of a gravid uterus can be a benefit in terms of easier access to the surgical field, after-partum patients are usually accompanied by anemia, infection, or hemodynamic crises and this may adversely affect the outcome of surgery. These aspects point out that the postpartum period is not riskless.

Outcomes of the mother who underwent laparotomy as an emergency are directly connected to the pathology behind it, the gestation age or postpartum condition, the severity of the disease when brought to the hospital, and the timely access to multidisciplinary care[6]. There are commonly reported complications like wound infection, sepsis, increased hospitalization, and intensive care. Mother physiological compromise and timing of surgical intervention are closely linked with fetal outcomes (preterm labor, fetal distress, intrauterine fetal demise)[7].

Other issues in low- and middle-income environments like delayed referral, inadequate diagnostic facilities and absence of specialized obstetric-surgical teams also increase the risks posed by emergency laparotomy in pregnant and postpartum women[8]. These macrosystemic factors lead to worse outcomes than the ones reported in high-resource healthcare systems.

Although clinical urgency laparotomy is crucial in such a vulnerable group, there is relative lack of region-specific data assessing outcomes in the mother and fetus, especially in resource-limited settings. Better knowledge of signs, complications, and the pattern of outcomes is necessary to inform a timely response, enhance multidisciplinary collaboration, and decrease the preventable morbidity and mortality.
Objective: To compare the results of emergency laparotomy in a pregnant and postpartum woman, paying special attention to such indicators, maternal events, fetal outcomes, and the aspects that may lead to negative outcomes.

MATERIALS AND METHODS

Study Design: This was a retrospective observational study that was intended to determine the consequences of emergency laparotomy on pregnant and postpartum patients. A retrospective design was selected since it provided an opportunity to evaluate real-world clinical practice and outcomes based on already existing hospital records without any manipulation of patient management or accommodation of new strategies.
Study Setting: The research was done in a Khalifa Gul Nawaz Teaching Hospital Bannu, Pakistan and analyzed medical records of patients between March 2023 and August 2023. The hospital offers 24 hour surgical, obstetric, anesthetic, and neonatal services hence making it the right environment in which the management of high-risk pregnant and postpartum patients requiring emergency laparotomy can be performed.

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Study Population: The research involved 96 pregnant women regardless of the gestational age and those postpartum and six weeks after delivery who experienced emergency laparotomy within the study period. Emergency laparotomy was considered as any emergency abdominal surgery that was done due to non-obstetric or obstetric reasons which could not be postponed. The patients who had undergone elective abdomen surgery, laparoscopic surgery without the conversion to open surgery or whose medical records are incomplete were excluded.

Data Collection: The hospital electronic medical record, emergency department logs, operation theater registers, anesthesia record and discharge summary were used to collect data. Patient demographics, pregnancy status and gestational age, postpartum period, presenting symptoms, indications to laparotomy, intraoperative observations, type of surgery or operation in which patient was operated, and blood transfusion requirement were also part of the information retrieved. Routine tests which are commonly found in the hospital, including complete blood count, and ultrasound results, were taken into consideration, and no expensive or sophisticated diagnostic tools were used.

Outcome Measures: The major outcome measures were neonatal and maternal outcomes after emergency laparotomy. Maternal outcomes were postoperative complications, which comprised wound infection, sepsis, admission into intensive care unit, length of stay and in-hospital mortality. Fetal outcomes were evaluated among pregnant women which included preterm birth, fetal distress, intrauterine fetal demise, and discharge neonatal survival. Among postpartum patients, only the maternal morbidity and mortality were the outcomes.

Management Protocol: The patients were attended to under normal hospital procedures. Resuscitation at the preoperative stage involved intravenous fluids, antibiotics, and blood transfusion as required. The on-call obstetrician and general surgeon made surgical decisions together with anesthetic and neonatal teams, according to the needs. Postoperative services were offered in surgical or obstetric wards and only those patients whose hemodynamic state was unstable or had severe complications received intensive care. No high cost or particular interventions were applied other than regular care.

Data Analysis: Data analysis was done with normal statistical software. Variables that were continuous were represented in the form of mean with standard deviation or median with interquartile range, as required by the data distribution. Frequencies and percentages were used to present categorical variables. The associations between indicators, characteristics of the patients, and the outcomes were investigated with the help of the corresponding statistical tests, and a p-value lower than 0.05 was considered a statistically significant value.

Ethical Considerations: The institutional review board at the hospital granted ethical approval of the study before the data collection occurred. Since this was a retrospective study, informed consent was not considered. Anonymity was applied to all personal identifiers in order to preserve patient confidentiality in the extraction and analysis of data.

RESULTS

A total of 96 pregnant and postpartum patients who had an emergency laparotomy were studied in the tertiary care hospital over the period of the study. Among these, 58 of the patients (60.4% were pregnant at the time of surgery and 38 patients (39.6) in the post partum (up to six weeks after birth). The average age of the patients was 29.8 years with standard deviation, 6.4 years. The majority of the patients were aged between 21 and 35 years. Table 1 presents a summary of baseline demographic and obstetric characteristics.

Acute appendicitis, intestinal obstruction, and bowel perforation were the most frequent pointers to emergency laparotomy. Among pregnant patients, appendicitis had the highest score, and in postpartum patients, intestinal obstruction was more prevalent and puerperal sepsis. Table 2 outlines the indications of emergency laparotomy.

With respect to maternal outcomes, 29 patients (30.2) had postoperative complications. The most common complications were surgical site infection, sepsis and the necessity to be hospitalized in the intensive care unit. There were 4 (4.2) cases of maternal mortality and they were all late cases of severe sepsis or peritonitis. Table 3 demonstrates maternal outcomes and postoperative complications.

On the 58 pregnant patients, adverse fetal outcomes had been recorded in 18 (31.0%). The most prevalent fetal complication was preterm delivery, then fetal distress and intrauterine fetal demise. The fetal outcomes were found to be better when patients received prenatal surgical treatment and their maternal hemodynamics had been stable on presentation. Table 4 sums up fetal results.

Table 1: Demographic and Obstetric Characteristics of Patients (N = 96)

Variable	Category	n (%)
Age group (years)	≤20	9 (9.4%)
	21–35	63 (65.6%)
	>35	24 (25.0%)
Patient status	Pregnant	58 (60.4%)
	Postpartum	38 (39.6%)
Trimester (pregnant)	First	12 (20.7%)
	Second	21 (36.2%)
	Third	25 (43.1%)
Postpartum period	≤2 weeks	22 (57.9%)
	3–6 weeks	16 (42.1%)

Table 2: Indications for Emergency Laparotomy (N = 96)

Indication	Number of Patients	Percentage
Acute appendicitis	28	29.2%
Intestinal obstruction	22	22.9%
Bowel perforation	14	14.6%
Puerperal sepsis	12	12.5%
Volvulus	9	9.4%
Abdominal trauma	6	6.3%
Other causes	5	5.1%

Table 3: Maternal Outcomes Following Emergency Laparotomy (N = 96)

Outcome	Number of Patients	Percentage
No complication	67	69.8%
Any complication	29	30.2%
Surgical site infection	14	14.6%
Sepsis	9	9.4%
ICU admission	6	6.3%
Maternal mortality	4	4.2%

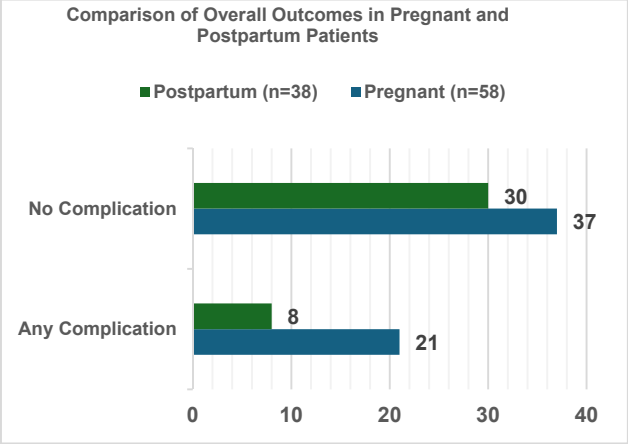
Table 4: Fetal Outcomes in Pregnant Patients (n = 58)

Fetal Outcome	Number of Patients	Percentage
No adverse outcome	40	69.0%
Preterm delivery	9	15.5%
Fetal distress	6	10.3%
Intrauterine fetal demise	3	5.2%

The general outcome analysis showed that most of the patients had healed without serious complications, but, a significant percentage had maternal or fetal morbidity. Comparison of overall outcomes between pregnant and postpartum patients is

depicted in Graph 1 where the complication rate is higher in pregnant patients than that of the post partum period.

Figure 1: Comparison of Overall Outcomes in Pregnant and Postpartum Patients



DISCUSSION

Emergency laparotomy in pregnant and postpartum patients is a risky clinical situation because of the changes in physiology and difficulties in diagnostics and balancing maternal and fetal health. In the current study, both maternal or fetal morbidity in a significant proportion of patients indicated the gravity of abdominal surgical emergencies in the patient group. Other reports of similar studies have indicated that emergency non-obstetric abdominal surgery in pregnancy is also linked to high levels of complications, especially when the diagnosis and treatment is late within the population compared to the non-pregnant population[9,10].

Such a disproportion between pregnant and postpartum patients in this cohort is explained by the diagnostic uncertainty that is frequently observed in the course of pregnancy when acute abdomen is covered by physiological and anatomical changes. Past literature has demonstrated that abdominal pain during pregnancy is often incorrectly attributed to obstetric etiology, which leads to the late referral of surgery, and advanced disease at the time of presentation[11]. The delay contributes greatly to the risk of sepsis, bowel perforation, and unfavourable outcomes of the fetus.

The most frequent indication of emergency laparotomy in pregnant patients in this study was appendicitis, which agrees with international data that appendicitis is the most common non-obstetric emergency surgery in pregnancy[12]. It is also observed that the risk of perforation is dependent on the gestation age and this has led to increased rates of maternal infection and fetal loss[13]. Post partum patients were more likely to have intestinal obstruction and bowel perforation, which is in most cases a result of previous surgeries, adhesions, or puerperal sepsis which are highly supported in the literature[14].

It was found that maternal complications occurred in almost one-third of patients and the most common were surgical site infection and sepsis. This complication rate correlates with the resource-limited settings, as delayed presentation, anemia, malnutrition, and poor access to early diagnostic imaging contribute to worse postoperative outcomes[15]. The maternal mortality was comparatively low but only the women who presented with advanced sepsis or generalized peritonitis died, which underlines the urgency of early resuscitation and early surgical intervention.

Outcomes in fetuses were highly associated with the maternal condition of presentation and gestational age. The most frequent adverse effects included preterm birth and fetal distress which are in accordance with the findings of other studies that show maternal systemic illness and surgical stress may trigger uterine contractions and fetal degradation[16]. Although rare, intrauterine fetal death is a disastrous complication and has been firmly linked with maternal hypotension, sepsis, and delayed surgery[17].

The fact that overall complication rate was greater when exposed to the pregnant patients than to postpartum patients demonstrates the extra burden of pregnancy. Higher oxygen usage, decreased functional residual capacity, and hypercoagulability put pregnant women at a higher perioperative risk[18]. Postpartum patients, in turn, are no longer at risk of being exposed to any gravid uterine and are typically characterized by either anemia, infection, or hemorrhage, all of which impact the outcomes negatively but to a relatively smaller degree.

These results support the need to have a multidisciplinary team of surgeons, obstetricians, anesthetists, and neonatologists, which would maximize the results. It has been demonstrated that early surgical consultation, timeliness in decision-making, and vigorous management of the perioperative condition have a great impact in reducing morbidity among the mother and fetus[19]. Also, enhancing the referral systems and advancing the awareness of non-obstetric causes of acute abdomen in frontline healthcare providers can help to diagnose and intervene earlier.

On the whole, the results of this study are valuable and represent the outcomes of emergency laparotomy in pregnant and postpartum patients in tertiary care. The findings are aligned to the available evidence that prompt surgical care and maternal stabilization are the most vital factors of good outcome irrespective of gestational status[20].

Limitations: This research has a number of limitations. Its retrospective nature restricts the possibility of developing causal relationships and the use of medical records could have led to missing full data. The study is a single-center study, so the results are not likely to be applicable to other healthcare settings. Also, there were no long-term neonatal and maternal outcomes outcomes that were measured after discharge. Future multicentric research using larger sample sizes and longer follow-up is required to more clearly determine the risk factors and optimize the management of emergency laparotomy in pregnant and postpartum women.

CONCLUSION

Laparotomy during an emergency in the pregnant and the postpartum patients is linked to high maternal and fetal morbidity that depends significantly on the underlying pathology, the physiological condition at the time of emergency, and the time of surgery. The pregnant patients were found to be at a more risk of complications than the postpartum patients especially when sepsis, bowel pathology or delayed diagnosis is present. Appendicitis was most commonly recognized during pregnancy whereas intestinal obstruction and puerperal sepsis were more common in the postpartum period. These results highlight a need to identify non-obstetric abdominal emergencies early, implement multidisciplinary care, and operate immediately to achieve better maternal and fetal outcomes in this high-risk group.

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