IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES
ISSN PRINT 2319 1775 Online 2320 7876

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11,Nov 2022

Preventing Surgical Complications during Pregnancy

Dr. Tripta S Bhagat[1]*, Dr. Shalabh Gupta[2], Dr. Aparajeeta Kumar[3], Dr. Sachin Choudhary [4]

[1*]Professor, Department of General Surgery, Santosh Medical College and Hospital, Santosh Deemed to be University, Ghaziabad
[2]Professor, Department of General Surgery, Santosh Medical College and Hospital, Santosh Deemed to be University, Ghaziabad
[3]Assistant Professor, Department of General Surgery, Santosh Medical College and Hospital, Santosh Deemed to be University, Ghaziabad
[4]Assistant Professor, Department of General Surgery, Santosh Medical College and Hospital, Santosh Deemed to be University, Ghaziabad

Corresponding Author : [1*]Dr. Tripta S Bhagat

ABSTRACT
Background: As up to 2% of pregnancies are affected by nonobstetrical surgical complications, general surgeons are routinely visited for these challenges. This population only experiences concerns about the enhanced morbidity for pregnant patients and their unborn.
Data sources: Through a Medline search and a review of applicable society and academy publications, a review of the English language literature pertaining to nonobstetrical surgical concerns was compiled.
Conclusions: Current knowledge on many areas of surgical care for pregnant patients is reviewed in this paper. Anesthesiology, radiography, laparoscopy, and particular rare and common surgical disorders seen in pregnant patients are among the topics discussed.

1. INTRODUCTION

Up to 2% of pregnancies can become complicated by nonobstetrical surgical issues, and each year, 50,000 pregnant ladies have nonobstetrical surgeries. This population is the only one that should be concerned about the increased morbidity for both the pregnant female and the fetus. The majority of maternal and fetus morbidity and mortality result from the underlying illness process rather than from diagnostic or therapeutic procedures. Understanding potential iatrogenic side effects can help to improve outcomes for both the mother and fetus. This review presents the most recent information on pertinent diagnostic and therapeutic treatment issues for anaesthesia.Current research on pertinent care issues for anaesthetic, diagnostic and therapeutic radiology, laparoscopy, and common and rare general surgical pathology in pregnant patients is outlined in this review.

Pregnant patients' anaesthesia considerations

Two main areas of anaesthetic concerns in pregnant patients can be differentiated: teratogenicity of the anaesthetic agents and maternal physiological abnormalities brought on

IJFANS International Journal of Food And Nutritional Sciences
Official Publication of International Association of Food and Nutrition Scientists

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11,Nov 2022

by anaesthetic drugs. The possibility for chromosomal damage or carcinogenesis in the fetus caused by anaesthetic drugs is minimally teratogenic. The following categories represent the various levels of drug safety currently understood during pregnancy: A: safety proven by human studies; B: assumed safety based on animal studies; C: questionable safety; no human studies; adverse effects shown in animal studies; D: unsafe; evidence of risk that may be justified under specific clinical conditions; X: Extremely dangerous [1].

During pregnancy, the mother's cardiovascular and pulmonary organs undergo numerous physiological changes. To avoid fetal hypoxia and hypotension, the general surgeon and anesthesiologist should be aware of these changes.

The pregnant patient's circulatory system is hyperdynamic, with an elevated cardiac output and heart rate. Total blood volume increases about 40% while red blood cell volume rises by about 25%. This causes a 30% decrease in hematocrit, which causes a relative anaemia of pregnancy. Through a rise in intraabdominal pressure, the expanding uterus can also reduce blood return from the inferior vena cava to the heart.

The first line of treatment for hypotension in a pregnant patient should be intensive intravenous fluid resuscitation. To enhance venous return, the patient should ideally be positioned in the left lateral decubitus position. To enhance venous return in the hypotensive patient, trendelenburg positioning can also be employed. If necessary, pressors can be applied. The perioperative care of the pregnant patient benefits from obstetric consultation. Fetal monitoring should be used during surgery and documented in the medical file to check for fetal distress.

Challenges with radiology in the pregnant general surgery patient

During the surgical management of a pregnant patient, diagnostic radiological testing and therapeutic radiation for malignancy are routinely taken into consideration. Because of the potential teratogenic risks to the foetus and the medical-legal consequences of the radiation dose causing birth abnormalities, doctors may be cautious to conduct a radiological scan.The benefits to the mother typically outweigh the minimal danger to the foetus in cases with acute indications with good maternal indications. It's critical that every caregiver, including the general surgeon, is aware of these complications.

The following are the most recent recommendations for radiation exposure:" No single diagnostic process creates a radiation dose that poses a risk to the health of the growing embryo and fetus, according to research". ACR [2] (American College of Radiology).When compared to the other dangers of pregnancy, "fetal risk is regarded to be low at 5 rad or less, and the chance of abnormalities is dramatically enhanced above control levels only at doses above 15 rad." [3](National Council on Radiation Protection)." Exposure to less than 5 rad hasn't been linked to an increase in fetal abnormalities or pregnancy loss, according to research. (The ACOG, or American College of Obstetrics and Gynecology) [4].

Studies in nuclear medicine can frequently be used on pregnant patients. The following information is based on a document published by the ICRP that describes current recommendations for radiation exposure in pregnant patients [9]. Both the radiopharmaceutical administered and the gamma camera have the potential to expose the fetus to radiation. Therefore, it's crucial to establish a pregnancy history before delivering these agents. The majority of radiopharmaceuticals, including technetium-99m, do not cross the placenta and do not significantly dose the fetus.However, radioactive iodine should not be used while pregnant since it crosses the placenta and can have a higher impact on the fetus.

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11,Nov 2022

Heat generated by the ultrasound waves' energy dissipation and cavitation, a phenomena brought on by tiny air bubbles forming at air-fluid interfaces, are two factors that contribute to the harmful consequences of ultrasound. These impacts are indicated on the display of contemporary ultrasound equipment that use higher energy outputs. Current research suggests that diagnostic ultrasound is safe for use during pregnancy when carried out by qualified professionals using the right tools [10–12].When used for a long time, colour doppler/duplex ultrasound may increase warmth and deliver more energy to the tissues with a low risk of side effects [13]. According to the ACOG's statement, ultrasounds are safe to use throughout pregnancy [14].

In conclusion, the radiation danger to the fetus can be reduced by using radiologic investigations sparingly, properly shielding them, and avoiding repeat tests. The surgeon, radiologist, and mother should all participate in the decision-making process regarding the risks and advantages of the study.

Pregnancy thrombotic disease

Due to decreased fibrinolysis and increased clotting factor activity, pregnancy may result in a hypercoagulable state. Deep venous thrombosis (DVT), which has an incidence of roughly 0.1% to 0.2%, is more likely as a result of coagulation changes and the increased pressure the uterus places on the inferior vena cava.In the past, when women were advised against walking for a few days after giving birth or having a caesarean section, most DVTs formed during the postpartum period. Currently, most pulmonary emboli happen after childbirth while most DVTs develop during pregnancy [15]. The more proximal deep veins (iliac veins) are more frequently affected by DVT in the pregnant population, and it tends to happen more frequently on the left side [12].

Long-term bed rest during pregnancy or the puerperium, instrument-assisted or caesarean deliveries, bleeding, sepsis, multiparity, smoking, and advanced maternal age are other factors that may increase the risk of deep vein thrombosis during pregnancy [14,16].

Devices that compress the lower extremities sequentially should be used frequently in the operation room or during periods of bed rest. Heparin is used to fully inhibit clotting as part of DVT treatment. Heparin and low molecular rate heparin are acceptable alternatives to warfarin during pregnancy due to the risk of severe foetal abnormalities and related deaths [8].Vena caval filters may be utilised, however they should be positioned suprarenally [14]. If a patient has a history of DVT or is at increased risk for DVT, prophylaxis with subcutaneous heparin during pregnancy may be suggested.

Treatment options for severe DVT episodes, such phlegmasiaceruleadolens, include thrombolytics and surgery. Alteplase, a recombinant tissue plasminogen activator, is a pregnancy class C drug that does not cross the placenta and is not allergenic and has very mild side effects in case series [9]. It has also been documented how to successfully remove venous thrombi utilising a longitudinal venotomy and an arteriovenous fistula that connects a side branch of the greater saphenous vein to the femoral or popliteal artery [10].

Surgical concerns for Pregnant Patients

Laparoscopy

In general, both mother and fetus during pregnancy have weathered laparoscopy successfully. Case studies have shown that laparoscopy is used more frequently in pregnant patients with few, if any, detrimental effects visible in comparison to laparotomy. The enlargement of the uterus frequently prevents the laparoscopic view and approach by the end of the second

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11,Nov 2022

trimester, at 26 to 28 weeks, and open surgery may be needed [9–13].Pneumoperitoneum with carbon dioxide can cause a mild metabolic acidosis with an increase in heart rate and blood pressure in sheep trials, according to a well known animal research by Hunter et al. [14]. Since the acidosis did not develop when employing nitrous oxide as the insufflation gas, it was likely secondary to carbon dioxide resorption and was not clinically significant [16].

2 million births occurred in Sweden between 1973 and 1993, and 2,233 laparoscopic and 2,491 open laparotomy cases were studied [12]. Birth weight, gestational age, intrauterine growth retardation, congenital abnormalities, stillbirths, and neonatal mortality were all studied as outcomes. There were no statistically significant differences between the groups receiving laparoscopy and those receiving laparotomy.It appears that, compared to the general population, there was an increased risk for infants in both the laparoscopy and laparotomy groups to weigh less than 2,500 g, be delivered before 37 weeks, and experience an increased incidence of growth restriction. However, the statistics are not fully evaluated in the paper.

On the internet and in pamphlet print, the Society of American Gastrointestinal Endoscopic Surgeons (SAGES) publishes guidelines for laparoscopic surgery during pregnancy. Table 2 [7] lists the key recommendations from SAGES.

About 50% of the time in various series, normal appendices were discovered, underscoring the challenge of making a diagnosis in the pregnant population. However, it was discovered that a negative procedure was not linked to any maternal or foetal morbidity [14]. Given that foetal loss occurs in that situation 20% of the time, the danger of a perforated appendix on the fetus may be significant [15].

Operationally, the surgeon should strive to steer clear of touching the uterus when performing the surgery. In viable pregnancies longer than 24 weeks, fetal monitoring should be utilised intraoperatively or after surgery. Tocolytics may also be suggested by obstetricians in order to avoid preterm labour, as this could make the early postoperative course more challenging.According to a study that looked at the Swedish registry, the likelihood of premature labour was 22% if the foetus was older than 23 weeks, and the likelihood of preterm delivery was also higher [12]. However, there was no increased risk of premature delivery if there was no preterm labour in the first postoperative week.

Gallstones

Gallstones can be spotted on an obstetric ultrasound in two to four percent of pregnant individuals. One in 1,000 of these pregnancies, or about 5%, will experience symptoms. Due to increased bile stasis and decreased gallbladder contraction, which results in a dilated gallbladder, pregnancy may predispose women to higher rates of problems from gallstone disease [6,7,9]. 242 pregnant women recruited in the first trimester were observed in a study from the University of Southern California.Gallbladder sludge was first identified by ultrasonography in 15% of cases, and stones in 6%. At the end of the pregnancy, new sludge or stones were discovered in 30% and 2% of the women, respectively. In 61% of the women who had previously shown sludge, postpartum sonography showed elimination of sludge, and in 28% of the women who had stones, it showed disappearance of stones.

This means that some patients who may have symptomatic cholelithiasis during pregnancy may not have it after delivery, according to the study's findings [10]. Progesterone has been linked to stone development and gallbladder emptying issues in studies on dogs [11].Sadly, before giving birth, symptoms will return in 50% of women who initially appear with them [12]

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11,Nov 2022

From 1980 to 1996, when over 30,000 births took place, a case series out of the University of California, San Francisco, followed 47 pregnant patients with symptomatic gallstones [13]. Thirty-three women had biliary colic, 12 had acute cholecystitis, and two had pancreatitis when they first arrived. In total, 17 of the 47 women, or 36%, required cholecystectomy during pregnancy after nonoperative treatment failed.Three women got open cholecystectomies, whereas 14 women underwent laparoscopic ones. More over half of the biliary colic patients experienced recurrences, and 25% required a cholecystectomy. Twelve patients with acute cholecystitis required five cholecystectomies while pregnant, and four more needed them after giving birth.No fetal morbidity or death is mentioned in the study. The majority of pregnant people can be treated without surgery, but those who experience repeated symptoms or severe symptoms should have a laparoscopic cholecystectomy under careful observation to safeguard the fetus.

Trauma in pregnancy

According to a research from the Cook County Medical Examiners office in Chicago, trauma was the leading cause of maternal death in this series, accounting for 45% of the 95 maternal deaths that occurred between 1983 and 1986 [15]. This is in line with the fact that trauma is the leading cause of death for all women who are reproductive age.Over the past 50 years, the rate of maternal deaths has significantly decreased, going from 582 per 100,000 live births to 7.8 per 100,000 live births. Most fatalities fifty years ago might be attributed to bad obstetric care.

The fetus may need to be saved through emergency cesarean delivery in an unstable mother. 32 emergency cesarean sections done on more than 441 pregnant women out of 114,952 consecutive trauma admissions were analyzed in a retrospective analysis including nine level 1 American College of Surgeons designated trauma facilities [9]. 42% of the embryos overall were born alive. In the group of fetuses with fetal heart tones and estimated gestational ages more than 26 weeks, survival rates were 75%. The mothers had a survival rate of 72%.

One of the risk factors for domestic violence is being pregnant, and between 5% and 30% of female trauma patients have experienced domestic abuse recently. The gravid abdomen, breasts, and genitalia are common anatomic locations of abuse in pregnant women [7]. There are straightforward screens for domestic violence that ask questions such, "Have you been hit, kicked, punched, or otherwise hurt by someone within the past year? If so, who, exactly?Female trauma patients have accepted domestic violence screening tests as a helpful component of their postinjury care [13]. Numerous organizations can aid in stopping current domestic abuse, and social workers can assist in identifying and treating the affected women.

Breast cancer

About 1 in 5,000 pregnancies result in pregnancy-associated breast cancer, which manifests during or within a year after pregnancy [14]. It is thought that women with breast cancer are detected later and with more advanced disease as a result of the difficulty in diagnosing the disease during and after pregnancy.Although it was once thought that the hormonal changes that occur during pregnancy would make the prognosis worse, recent investigations have refuted this notion [15].Its survival is comparable to that of breast cancer not related to pregnancy, stage for stage.

Chemotherapy can also have negative effects on the fetus, with the first trimester experiencing the worst teratogenetic effects, such as a high prevalence of stillbirths and

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11,Nov 2022

severe deformities [10]. All four of the fetuses in one group who received chemotherapy during the third trimester were delivered alive and unharmed. In France, 20 women with breast cancer who were pregnant received chemotherapy, according to a multi-institutional study. The information was gathered by sending questionnaires to members of different French oncological groups. Two first-trimester patients both experienced spontaneous abortions.One stillbirth and two pregnancy difficulties were among the remaining 18, but the children of the 17 deliveries fared well in the short term [8]. Chemotherapy can often be used safely in the second and third trimesters but should be avoided during the first trimester. There is currently no conclusive evidence demonstrating how chemotherapy administered during pregnancy as opposed to waiting until after birth affects maternal outcome.

To reduce leukopenia and any possible fetal issues linked to it, chemotherapy should be halted about three weeks before birth [7]. Hormonal medication is not advised during pregnancy since it could have negative effects on the fetus [2].In conclusion, surgeons should use mammography, ultrasounds, and biopsies as necessary in their workup for breast lumps in pregnancy. Pregnancy hormones have not been found to make breast cancer more aggressive or affect the outlook for a particular stage.

Although sentinel lymph node biopsies have not been investigated in pregnant women, pregnancy is not a contraindication for a surgical resection of a breast cancer. Radiation therapy should not be administered when pregnant, however if postponed until after delivery, breast conservation may be an option.The decision regarding a therapeutic abortion should only be made after the patient and the surgeon have had a full conversation about the advantages and disadvantages of the surgery. When an oncologist immediately advises chemotherapy in the case of an aggressive malignancy in the early stages of pregnancy, it would most likely be beneficial to the mother's prognosis. Following breast cancer diagnosis and treatment, being pregnant again doesn't seem to raise the risk of the disease progressing or returning [2,3].

Unusual surgical issues during pregnancy

Splenic artery aneurysms

Splenic artery aneurysms are infrequent but can be devastating to pregnant people. The three main risk factors for the occurrence of splenic artery aneurysms are pregnancy, repeated gestations, and portal hypertension. Pregnancy-related hypertension may also have an impact on the association with pregnancy, which is thought to be brought on by changes in the hormonal environment that occur during pregnancy [7].When a splenic artery aneurysm ruptures during pregnancy, the mortality rate is approximately 75%, and thefetal mortality rate is 95% [8]. Unfortunately, the majority of splenic artery aneurysms in pregnant individuals are only found after they rupture, at which point splenectomy and splenic artery ligation are the only options for therapy.

Hepatic adenomas

Most frequently, oral contraceptive use is linked to hepatic adenomas. When oral contraceptives are found in a non-pregnant patient, they should be stopped, and if the adenomas don't go away after observation, they should be surgically removed.

Pregnancy-related sex steroid surge raises the liver's vascularity, which increases the likelihood that preexistingtumors would burst and cause greater than 50% mortality for both the mother and the fetus [9]. Hepatic adenomas that are found during pregnancy should be

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11,Nov 2022

monitored with ultrasonography and removed if they increase or are greater than 5 cm. Many examples of successful pregnancies following liver resection for hepatic adenoma exist [9].

Pheochromocytoma

Although pheochromocytoma is uncommon during pregnancy, it should be suspected in any patient who has labile hypertension and is pregnant [11]. Approximately 200 cases have been documented in the literature. Failure to detect pheochromocytoma before delivery will result in a 50% mortality rate for both the mother and the fetus. Resection done before delivery can lower mortality to under 5%. The examination is identical to that for patients who are not pregnant, and MRI is the preferred diagnostic tool.The first step of treatment entails phenoxybenzamine blood pressure management, perhaps with beta blockers.Laparoscopic or open adrenalectomy during the second trimester is secure. The third trimester is the ideal time for either vaginal delivery followed by a postpartum elective adrenalectomy or a combination cesarean section and adrenalectomy.

2. CONCLUSIONS

A general surgeon will encounter pregnant patients with a range of elective, urgent, and emergent general surgical difficulties over the course of their practice. In general, care should be provided in the urgent and emergent situations in the same way it would for a patient who is not pregnant. To help with the care of mother and fetus, an obstetrician should be consulted. The surgeon should have a fundamental awareness of the conditions unique to pregnancy that complicate treatment.

3. REFERENCES

1. Fleischer AC. Ultrasound in obstetrics and gynaecology. In: Grainger RG, Allison D, Andreas A, Dixon AK, editors. Grainger and Allison's diagnostic radiology: a textbook of medical imaging. 4th ed. London: Churchill Livingstone, 2001, p 2177–8.
2. Miller MW, Brayman AA, Abramowicz JS. Obstetric ultrasonography: a biophysical consideration of patient safety—the "rules" have changed. Am J ObstetGynecol 1998;179:241–54.
3. Hershkovitz R, Sheiner E, Mazor M. Ultrasound in obstetrics: a review of safety. Eur J ObstetGynecolReprodBiol 2002;101:15–18.
4. Toglia MR, Weg JG. Venous thromboembolism during pregnancy. N Engl J Med 1996;335:108–14.
5. Dizon-Townson D. Pregnancy-related venous thromboembolism. ClinObstetGynecol 2002;45:363–8
6. Reedy MB, Kallen B, Kuehl TJ. Laparoscopy during pregnancy: a study of five fetal outcome parameters with use of the Swedish Health Registry. Am J ObstetGynecol 1997;177:673–9.
7. SAGES publication 0023. SAGES guidelines for laparoscopic surgery during pregnancy. Available at: http://www.sages.org/sg_pub23. html. Accessed October 1, 2002.
8. Kort B, Katz VL, Watson WJ. The effect of nonobstetric operation during pregnancy. SurgGynecolObstet 1993;177:371–6.

Research paper UGC CARE Listed (Group -I) Journal Volume 11, Iss 11,Nov 2022

9. Coleman MT. Trianfo VA. Rund DA. Nonobstetric emergencies in pregnancy: trauma and surgical conditions. Am J ObstetGynecol 1997;177:497–502.
10. Mourad J, Elliott JP, Erickkson L, Lisboa L. Appendicitis in pregnancy: new information that contradicts long-held clinical beliefs. Am J ObstetGynecol 2000;182:1027–9.
11. Hoover HC. Breast cancer during pregnancy and lactation. SurgClin North Am 1990;70:1151–63.
12. von Schoultz E, Johansson H, Wilking N, et al. Influence of prior and subsequent pregnancy on breast cancer prognosis. J ClinOncol 1995; 13:430–4. [87] Dave SP, Reis ED, Hossain A, et al. Splenic artery aneurysm in the 1990s. Ann VascSurg 2000;14:223–9.
13. Caillouette JC, Merchant EB. Ruptured splenic artery aneurysm in pregnancy: twelfth reported case with maternal and fetal survival. Am J ObstetGynecol 1993;168:1810–13.
14. Hill MA, Albert T, Zieske A, Levine EA. Successful resection of multifocal hepatic adenoma during pregnancy. South Med J 1997;90: 357–61.
15. Terkivatan T, de Wilt JHW, deMan RA, Lizermans JNM. Management of hepatocellular adenoma during pregnancy. Liver 2000;20: 186–7.
16. Brunt LM. Phaeochromocytoma in pregnancy. Br J Surg 2001;88: 481–3