

A Hospital Based Study of Acute Appendicitis in Pregnancy, Management and OutcomesPriyanka¹, Manish Shah², Abha Rani Sinha³¹Senior Resident, Department of Obstetrics and Gynaecology, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar²Senior Resident, Department of Surgical Gastroenterology, Indira Gandhi Institute of Medical Sciences, Patna, Bihar³Professor and Head of Department, Department of Obstetrics and Gynaecology, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar

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Conflict of interest: Nil

Abstract:**Background:** The most frequent surgical emergency during pregnancy is acute appendicitis. In this study, pregnant patients admitted with symptoms of acute appendicitis had their clinical presentation, care, and outcomes (both maternal and fetal) examined.**Methods:** Between November 2021 and April 2022, 56 pregnant women with acute appendicitis-like symptoms were admitted; 51 of these patients underwent appendectomy, and 5 patients were treated conservatively. We analyzed the outcomes in terms of presentation, management, and fetomaternal outcomes in these patients.**Results:** In 88.23% (45/51) of the cases that underwent surgery, intraoperative observations and pathology data supported the diagnosis of acute appendicitis. 11.7% (6/51) of the patients had perforated appendicitis. Leukocyte count, CRP, body temperature, nausea, vomiting, and back discomfort all had a low yield in making the right diagnosis. An inexpensive, secure, and reliable diagnostic technique, the USG abdomen had a diagnosis accuracy rate of roughly 95%. The appendectomy was not associated with any maternal deaths. Following an appendectomy, a fecal fistula occurred in one patient (1.78%). Pregnancy complications were found to be considerable: 3/8 (37.5%) of the appendices removed for appendicitis in the first trimester spontaneously aborted. Premature delivery and fetal death were the results of appendicitis-related appendectomies in the second and third trimesters in 7/36 (19.44%) and 1/7 (14%), respectively. In cases of perforated appendicitis, we observed an increase in pregnancy problems (5/6); 83.3% of these patients lost a fetus while being monitored.**Conclusion:** When a pregnant woman reports new abdominal pain, appendicitis should be suspected. There were no lab results that could be used to diagnose acute appendicitis in pregnant women. After an appendectomy in the first and second trimesters of pregnancy, a sizable amount of fetal loss was discovered. It was shown that cases of perforated appendicitis had more complications. It is critical to consider symptoms, ultrasonography, and clinical judgment when determining whether patients require surgical intervention.**Keywords:** Acute appendicitis; Pregnancy; Pregnancy outcomes.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Although uncommon, acute appendicitis is still the most frequent non-obstetric emergency during pregnancy, occurring in about 1 in 1500 pregnancies. The incidence in the first trimester range from 19% to 36% [1-4].

In the second trimester, the incidence is higher, ranging from 27% to 60%[1-3], but it has been noted that the incidence decreases from 15% to 33% in the third trimester; the rates of perforation pregnant patients have been reported as high as 55% of cases, compared with 4% to 19% of the general population [2].

Material and Methods

Between November 2021 and April 2022, the Department of Obstetrics and Gynecology at Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, conducted this prospective observational study in cooperation with the Department of Surgery. 56 pregnant women with acute appendicitis symptoms in all were admitted; 51 of these patients underwent appendectomy, and 5 patients received conservative management. In 51 patients, 45 had appendicitis that was obvious, and 6 had peritonitis due to perforation.

After careful history taking, clinical examination, laboratory testing, and ultrasound inspection, pregnant women who were diagnosed with acute appendicitis were included. Clinical criteria were anorexia, nausea, vomiting, constipation, low-grade fever, soreness in the right iliac fossa, and rebound discomfort in addition to acute stomach pain that initially appeared diffuse before settling in the right iliac fossa. TLC greater than 16,000/mm³ (total leukocyte count). The Radiology department used a

high frequency linear transducer and graded compression technique to perform ultrasounds. The Target sign, a non-compressible, blind-ended tubular structure in the lower right quadrant with a maximum diameter greater than 6 mm, altered peri-appendiceal fat in the form of increased echogenicity, localized peri-appendicular fluid collection, and hyper vascularization of the appendix in a color Doppler study were all ultrasound criteria.

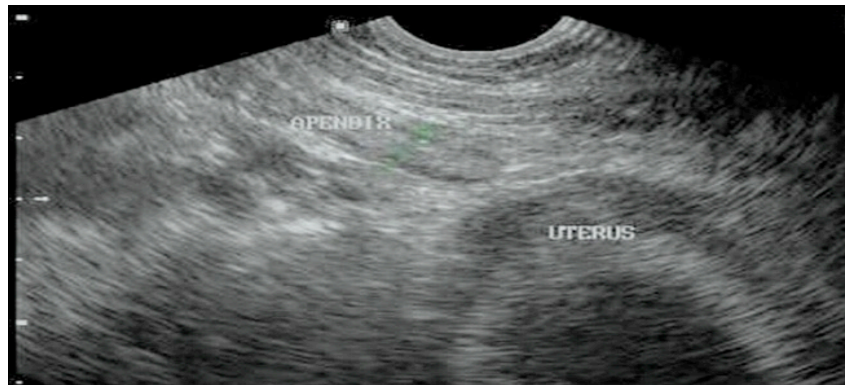


Figure: USG of pregnant patient with appendicitis

Results

In our hospital, 56 pregnant women with a diagnosis of acute appendicitis were admitted. (Table 1) The median age was 27.7 years. Ten patients were pregnant in the first trimester, 39 were in the second trimester, and seven were in the third (Table 2).

Table 1: Table showing number of patients and ages in years

Age in years	Number of patients
24-26	16
27-29	28
30-32	12
Average age 27.7	Total 56

Table 2: Table showing period of gestation and number of patients

Period of gestation	Number of patients
First trimester	10
Second trimester	39
Third trimester	7

Among these patients, 51 appendectomies were carried out; five individuals received conservative care. Two of the patients who received conservative management were in their first trimester and three were in their second. 18 primis and the rest multigravidas were present. Tables 3 and 4 list the symptoms and warning indications of acute appendicitis.

Table 3: Presenting symptoms in pregnant patients

Symptoms	1st Trimester Total 10	2nd Trimester Total 39	3rd Trimester Total 7
Pain RIF	10 (100%)	12 (30.7%)	1 (14.3%)
Pain RUQ	-	24(61.5%)	4 (57.1%)
Diffuse Pain	-	3 (7.7%)	2(28.5%)
Nausea	8 (80%)	11 (28.2%)	3 (42.8)
Vomiting	7 (70%)	13 (33.3%)	1 (14.2%)
Anorexia	8 (80%)	15 (38.4%)	2 (28.5%)
Fever	6 (60%)	5 (12.8%)	1 (14.2%)
Bleeding PV	-	1 (2.5%)	-

Table 4: Physical signs in pregnant patients

Signs	1st Trimester Total 10	2nd Trimester Total 39	3rd Trimester Total 7
Tachycardia	8 (80%)	19 (48.7%)	5 (71.4%)
Tender RIF	10(100%)	11 (28.2%)	-
Tender RUQ	-	23 (59%)	4 (57.1%)
Diffuse tenderness	-	5 (12.8%)	3 (42.8%)
Rebound tenderness	6 (60%)	29 (74.3%)	5 (71.4%)
Guarding	7 (70%)	21 (54%)	3 (42.8%)
Appendicular lump	-	2 (51.2%)	-
Decreased bowel sounds	5 (50%)	22 (56.4%)	6 (85.7%)

Abdominal pain was a common complaint among all patients. Twenty-one patients reported vomiting and twenty-four patients reported experiencing nausea, while 25 patients reported anorexia and a dislike of food in the past 24 hours.

On inspection, 12 patients had fever, and laboratory tests revealed 33 had polymorphonuclear leucocytosis. In 42 patients, an abdominal USG

revealed acute appendicitis, and two patients had appendicular lumps, which an ultrasound verified. C reactive protein was elevated in 85.7% of the patients.

Six patients (11.7%) had perforated appendicitis, and there was no indication of acute appendicitis in 45 patients (88.23%) who had intraoperative and histological confirmation of appendicitis. (Table 5)

Table 5: Laboratory findings in pregnant patients with appendicitis

Laboratory findings	1st Trimester Total 10	2nd Trimester Total 39	3rd Trimester Total 7
Leukocytosis 10,000- 16000	6 (60%)	21 (54%)	2(28.5%)
Counts >16000	2 (20%)	12 (30.7%)	3(42.8%)
Polymorphs >80%	6 (60%)	22 (56.4%)	5(71.4%)
Elevated CRP	9 (90%)	33(84.6%)	6(85.7%)
Bacteriuria	3 (30%)	12(30.7%)	1(14.2%)
Pyuria	4 (40%)	12 (30.7%)	2(28.5%)
USG evidence	7 (70%)	32 (82%)	3(42.8%)

The average period of hospitalization was 5.2 days (range 4-8 days). The postoperative complications in the patients are summarized in (Table 6). Pregnancy complications were found to be considerable: 3/8 (37.5%) of the appendices removed for appendicitis in the first trimester spontaneously aborted.

In 7/36 (19.44%) cases of second trimester appendectomy for appendicitis, abortion or premature birth occurred. Premature delivery

occurred after a third trimester appendectomy for appendicitis in 1/7 (14%) of the cases (Table 7); 2 of 5 patients who were conservatively handled during this time experienced spontaneous abortions.

In our investigation, there was no maternal mortality noted. In cases of perforated appendicitis, we observed an increase in pregnancy problems (5/6); 83.3% of these patients lost a fetus while being monitored.

Table 6: Complications in operated cases of pregnant patients with appendicitis

Complication	1st Trimester Total 8	2nd Trimester Total 36	3rd Trimester Total 7	Total
Fever	2	10	2	14/51 (27.4%)
Wound infection	1	6	2	9/51 (17.6%)
Fecal fistula	-	1	-	1/51 (1.8%)

Table 7: Obstetric outcomes in operated cases of pregnant patients with appendicitis

Obstetric outcome	1st Trimester Total 8	2nd Trimester Total 36	3rd Trimester Total 7
Abortion	37.5% (3/8)	8.5%(3/36)	-
Premature delivery	-	11.2% (4/36)	14%(1/7)

Discussion

It can be difficult to manage cases of appendicitis during pregnancy. It is challenging to make a diagnosis because pregnancy naturally causes physiological changes. The physical signs and test results that are frequently used to diagnose

appendicitis change during pregnancy and can be mistaken for typical physiological changes.

Due to potential teratogenic effects on the fetus from several diagnostic procedures like CT scan and X-ray abdomen, the surgeon is restricted in how they can be used during pregnancy. The surgeon is simultaneously tending to two patients,

thus both must be taken into account [5]. This study revealed that appendicitis occurs more commonly in the first two than the third trimester.

In the first trimester, morning sickness, ectopic pregnancy, and twisted ovarian cyst can all be mistaken for the symptoms of appendicitis [6]. The patient complains of greater, more lateral abdominal or right flank pain in the third trimester, which is frequently misdiagnosed as ureteric colic [6]. Due to extended abdominal muscles, it can be challenging to elicit guarding and rigidity throughout the third trimester [7]. Blood and urine tests in the lab may not be very helpful for diagnosis. Early pregnancy abortions and preterm births are still common even with prompt intervention.

Septicemia and preterm can contribute to high fetal mortality. When appendicitis is suspected, an appendectomy should be done just like there is no pregnancy [8]. Complications can be reduced if surgery is done before the appendix ruptures since perforation worsens the results for pregnant women. To reduce side effects, a multidisciplinary strategy is required, comprising concurrent gynecological consultation. [9].

Conclusion

Fetal mortality rates have been reported to range from 2 to 8.5%, although perforation and peritonitis cause rates to rise to over 35% [10, 11].

Timely intervention is feasible and encouraged because preterm labor is a problem [12].

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