

Original article:

Investigation of the Risk, Clinical Presentation, Management and Outcomes of Acute Appendicitis in Pregnancy

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Abstract:

Introduction: Appendicitis is one of the most common surgical problems in pregnancy, but it does not occur more often in pregnant women than in non-pregnant women. The aim of the present study was to investigate the Risk of Acute Appendicitis in Pregnancy in India.

Materials and Methods: The study population consisted of 20 pregnant women out of which 15 pregnant women underwent operation after the diagnosis of appendicitis and 3 were treated conservatively. All the 5 patients were diagnosed as appendicitis in first trimester at the department of general surgery. The following data were analysed: age, gestational age, signs and symptoms on presentation, duration of symptoms, physical findings, laboratory parameters, ultrasonography, diagnostic modalities, duration of time to operation from admission, surgical findings, histological diagnosis, maternal morbidity and maternal and fetal mortality.

Result: In 15 cases (75%) the history of Pain did not exceed 1 day whereas 5 patients (25%) presented with symptoms of longer than 2 days duration. The most common complaints were abdominal pain in right lumbar and hypochondriac region (100%), nausea and vomiting (88%) and fever (86%). The most common physical findings on initial physical examination were abdominal tenderness (90%).

Conclusion: Delay of surgery correlates to more advanced disease with an increased risk of appendiceal perforation. This, in turn, contributes to an increased risk of further complications including premature labor or abortion, and to higher maternal complication rates. Prompt diagnosis may improve the prenatal outcome.

Keywords: Appendicitis, Pregnant Women, Morbidity, Maternal and Fetal Mortality.

INTRODUCTION

The vermiform appendix is considered by most to be a vestigial organ; its importance in surgery results only from its propensity for inflammation, which results in the clinical syndrome known as acute appendicitis.¹ Acute appendicitis is one of the most common general surgical emergencies worldwide, with an estimated lifetime risk reported to be 7–8%.² Appendicitis is one of the most common surgical problems in pregnancy, but it does not occur more often in pregnant women than in non-pregnant women. The incidence is 0.1%–0.2%,³ and is approximately the same in all three trimesters. Of all surgical problems during pregnancy, appendicitis causes the greatest incidence of fetal loss.⁴ The particular dangers of appendicitis in pregnancy lie in the varied

presentation of symptoms and the higher chance of delayed diagnosis. The outcome may be improved if prompt diagnosis is made, and surgical intervention combined with obstetric care is performed at an early stage of the disease.⁵ Furthermore, increasing gestational age reduces diagnostic accuracy and is associated with increased rates of appendiceal perforation and hence complications. Appendectomy can be performed either by laparoscopic or open access surgery. Open appendectomy is done as our hospital is not equipped with laparoscopic set up just like any other rural hospital. In laparotomy we can give good operative procedure under direct vision and post-operative complications can be tackled.

Despite being so common, a poor understanding of the causes of appendicitis and an absence of reliable discriminators for disease severity still persist. An insufficient amount of clinical research has led to uncertainty about best practice, with subsequent international variation in delivery and, as a possible consequence, variation in outcome. Urgent appendectomy is the accepted treatment to prevent perforation, which is the single most important factor in morbidity and mortality. Maternal mortality associated with acute appendicitis declined from 24% in 1908 to 0.5% in 1977 and rarely occurs today; however, there remains a high risk of morbidity for both the mother and the fetus. This has markedly reduced the morbidity but has led to an increase in diagnostic error rate.⁶⁻⁸ Furthermore, these risks can occur after appendectomy, and the rates of negative appendectomy may be greater in pregnant than in non-pregnant women due to diagnostic difficulty. In particular, the trimester of pregnancy during which a woman is at highest risk of acute appendicitis and the extent to which age affects these risks are poorly understood. In addition, there is no population-based study to date reporting the incidence rates of acute appendicitis during the post partum period. Finally, the reported negative appendectomy rate in pregnancy varies considerably among studies from 5% to 50%.⁹⁻¹⁹

METHODS

This was a retrospective single-center study that presented a descriptive analysis of the results. The study population consisted of 20 pregnant women out of which 15 pregnant women underwent operation after the diagnosis of appendicitis and 3 were treated conservatively. All the 5 patients were diagnosed as appendicitis in first trimester at the department of general surgery. The following data were analysed: age, gestational age, signs and symptoms on presentation, duration of symptoms, physical findings, laboratory parameters, ultrasonography, diagnostic modalities, duration of time to operation from admission, surgical findings, histological diagnosis, maternal morbidity and maternal and fetal mortality. Gestational age at the time of diagnosis was first trimester in 5 patients and second and third trimester in 15 patients. All operated 15 patients had pathologically proven appendicitis.

RESULTS

In 15 cases (75%) the history of Pain did not exceed 1 day whereas 5 patients (25%) presented with symptoms of longer than 2 days duration. The most common complaints were abdominal pain in right lumbar and hypochondriac region (100%), nausea and vomiting (88%) and fever (86%), the most common physical findings on initial physical examination were abdominal tenderness (90%).

An abnormal total white blood cell count ($>11000 \text{ cells/mm}^3$) was present in 16 cases (80.0%). Of these 16 cases, 12 (75%) had white cell counts $>15000 \text{ cells/mm}^3$, approximately 50% of patients had neutrophilia counts of 70%-90%, and near about 45% of patients had neutrophilia counts of $>90\%$. Abdominal ultrasound confirmed the presence of appendicitis in all the 20 patients.

In all patients, appendicitis was confirmed by a pathological report. 15 babies were delivered at term. The most common complications were premature uterine contractions in 5 patients (33%), preterm labor in 2 patients (13.33%), remaining 8 patients operated for appendicectomy had normal obstetric outcome. The most common complications were premature uterine contractions, preterm labor and fetal mortality. Uterine contractions occurred in 5 patients, only two of them were in their third trimester. All those patients received tocolytic agents for treating contractions. Preterm labor occurred in one patient, had been treated by tocolytics. Still birth and neonatal death was not seen. There was no maternal mortality in this series.

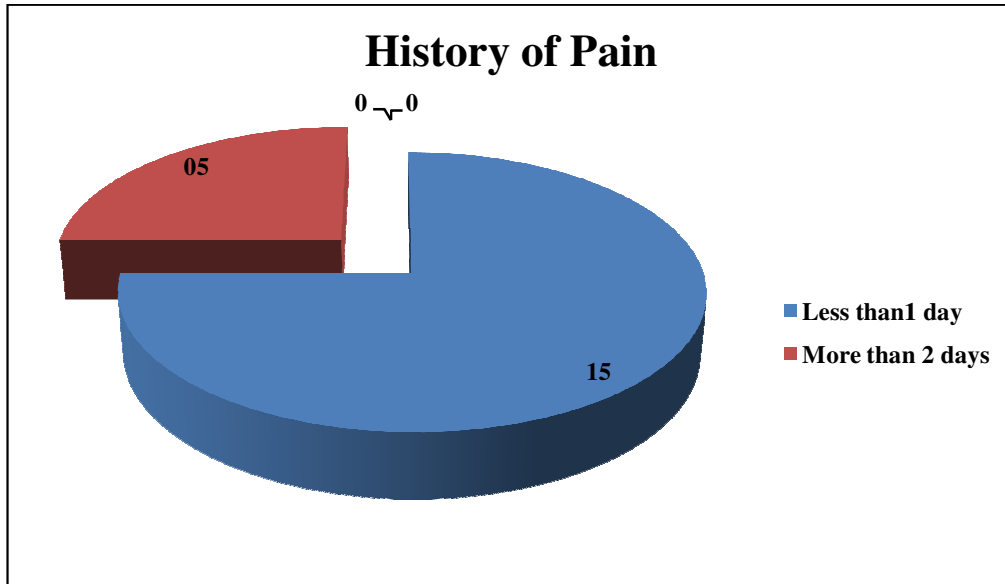


Figure 1: History of pain.

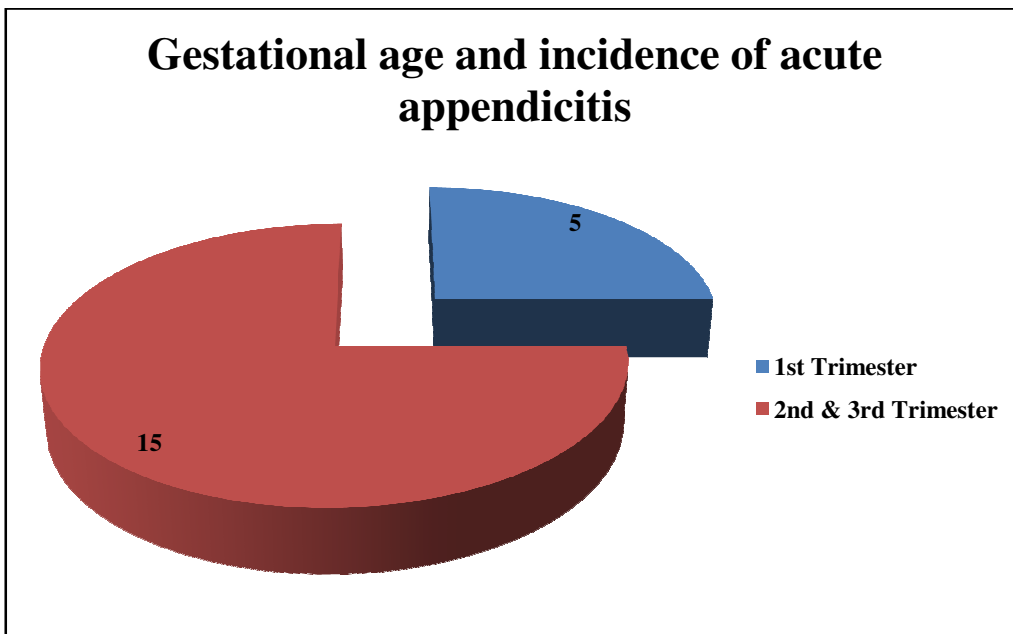


Figure 2: Gestational age and incidence of appendicitis.

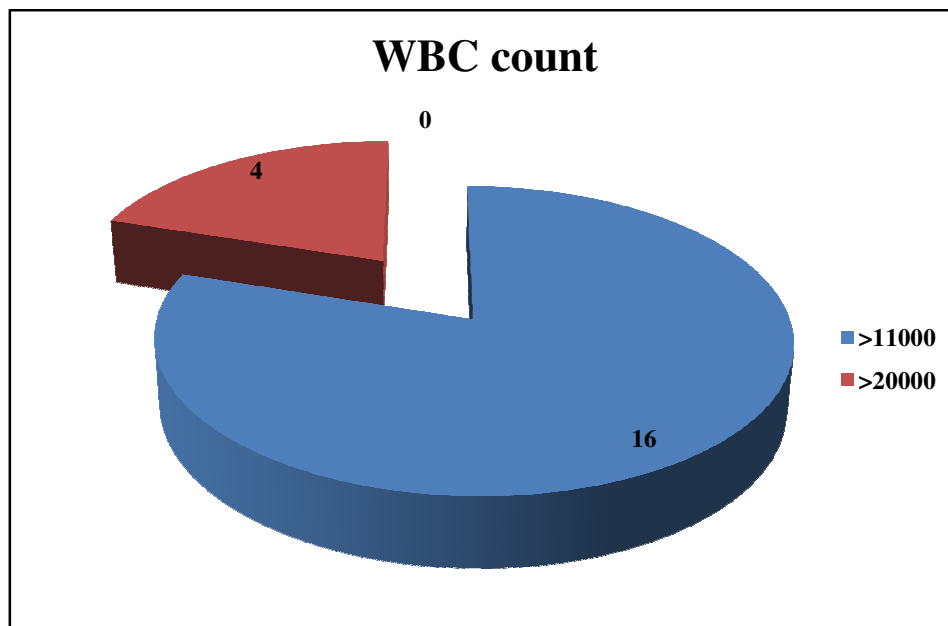


Figure 3: Total White cell count.

DISCUSSION

Acute appendicitis is one of the most common causes of surgical emergency not related to obstetrics during pregnancy. The uterus enlarges approximately 20 times during pregnancy as compared with the non-pregnant state that results in stretching of supporting ligaments and muscles. It also exerts pressure on other intra-abdominal structures and the layers of the anterior abdominal wall, thereby preventing the latter from being “irritated” by the inflamed intra-abdominal organ. The uterus can also obstruct and inhibit the movement of the omentum in an area of inflammation that may prevent this “policeman” of the abdomen from localizing the infection. Therefore, anatomical, physiological and biochemical changes due to the pregnant state alter classical symptoms and signs that would be normally associated with various disorders like acute appendicitis. Signs of acute appendicitis in pregnancy may show as pain in right lumbar or hypochondriac region because of pushing of caecum along with appendix upwards subhepatically because of gravid uterus. Classical rebound tenderness or other signs of acute appendicitis may not be seen in pregnant women. The most common problems that were confused with appendicitis were preterm labor, intra-uterine infection, abruptio placentae and other acute abdominal surgical problems. Therefore, whenever acute appendicitis is suspected, regardless of whether the patient is admitted to either the obstetrics or the surgical department, close cooperation between the surgeon and the obstetrician is necessary. When the diagnosis of appendicitis is uncertain, a series of observations, laboratory values and ultrasonography can help rule out other causes of abdominal pain, such as ovarian cyst, pyelonephritis, ureter stone, pancreatitis, cholecystitis and abruptioplacentae.²⁰

If there is evidence of appendicitis and no alternative diagnosis seems likely, surgical intervention is warranted no matter what stage the pregnancy has reached. Intraoperative considerations must include slight left

positioning of the patient and minimal uterine manipulation. The operative approach depends on surgical preference. Preterm contractions are common after appendectomy but progression to labor is rare.

CONCLUSION

We found that young pregnant women also posed a diagnostic problem in the management of acute appendicitis. The symptoms of appendicitis mimic symptoms of normal pregnancy, namely, anorexia, nausea, vomiting, and abdominal discomfort. Bearing in mind the diagnostic difficulty inherent to this group of patients, we still believe that the diagnostic error rate could be reduced if repeated examinations were performed until more confirmative signs were obtained before proceeding to do the operation. Delay of surgery correlates to more advanced disease with an increased risk of appendiceal perforation. This, in turn, contributes to an increased risk of further complications including premature labor or abortion, and to higher maternal complication rates. Prompt diagnosis may improve the prenatal outcome.

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