ACUTE APPENDICITIS COMPLICATING PREGNANCY; EXPERIENCE WITH THE MANAGEMENT OF 50 PATIENTS

Abbas Ghazanfar, Shahid Mahmood Nasir, Zafar Ali Choudary, Waseem Ahmad
East Surgical Unit, Mayo Hospital Lahore. Pakistan

Background: The purpose of this study was to highlight the problems related to acute appendicitis complicating pregnancy and to lay down the principle of their management. **Materials and Methods:** This study was conducted at Department of Surgery, East Surgical unit Mayo Hospital Lahore from January 1999 to June 2001. It included 50 pregnant patients who presented to emergency department with the diagnosis of acute appendicitis. **Results:** Of these 50 patients, 16 were primigravida and 34 were multigravida, with the mean age of 26.5 years. Most of these patients were in their second trimester (n= 26), followed by first trimester (n= 19) and third trimester (n= 5). Pain right iliac fossa (72%) was the commonest symptom, followed by vague generalized abdominal pain (18%) and backache (10%). All the patients under went laparotomy; with 86% positive and 14% negative results. There was no maternal mortality in our study, however 14% foetal mortality was noted. **Conclusion:** Unnecessary delay in diagnosis and management should be avoided as it is directly related to maternal and foetal morbidity and mortality. The general use of this principle may explain the marked improvement in maternal and foetal mortality and morbidity.

INTRODUCTION

Evaluation of a female patient who presents with acute abdomen always remains a challenge and it becomes more troublesome when a pregnant patient presents with acute abdomen[1]. Non-obstetric surgery in the pregnant patient can be both diagnostically and technically challenging[2]. Diagnosis of appendicitis in pregnancy is difficult, as in other abdominal surgical conditions. The symptoms are non-specific and most often are attributed to pregnancy itself[1-3]. Diagnostic delays tend to occur in pregnant patients for many reasons: first, and the most important is the misinterpretation of signs and symptoms of acute appendicitis with the pregnancy, both by the patient and her treating physician. Second, the pregnant abdomen is difficult to examine and usually hide or change the classical signs of acute appendicitis and lastly many of physicians are more conservative with pregnant patients and this may actually tend to do more harm by causing a delay in diagnosis and treatment[1,4,5]. It is well known that the delay in diagnosis and definitive treatment represents the most significant risk for poor outcome on both mother and her foetus[6]. In 1908 it was first reported that the mortality of appendicitis complicating pregnancy is the mortality of delay[7]. This holds true for any condition that would cause an acute abdomen in pregnancy: however, surgical diseases in pregnancy are a rare event, there remains a lack of data on the indications for operation, approach of operation, and risk to mother and foetus[8]. This present study describes our experience with the management of acute appendicitis complicating pregnancy.

MATERIALS AND METHODS

This study was carried out at Department of surgery; East Surgical Unit, Mayo Hospital Lahore, from January 1999 to July 2001. It included a total of 50 pregnant patients who presented to the emergency department with probable diagnosis of acute appendicitis. All the patients were admitted, after resuscitation full history and thorough clinical examination were recorded. The history included the site of pain, its onset, character, migration, radiation, aggravating and relieving factors and any associated symptoms like nausea, vomiting, fever etc. The period of gestation was noted. Any problems and or complication during previous pregnancies were noted. The clinical

examination included general physical examination, abdominal examination and pelvic examination. Laboratory investigations included Total Leukocyte Count and urine examination. Abdominal ultrasonography was performed where delay in the surgical treatment could be tolerated both by the patient and her treating surgeon. Prompt surgical intervention was done when the diagnosis of acute appendicitis was established. In patients where the doubt existed, serial examinations were performed to confirm the diagnosis. Third generation Cephalosporin in dose of 1 gram I/V was administrated during induction of Anaesthesia and post operatively b.i.d. for three days. Foetal heart sounds were monitored postoperatively to ensure foetal well-being; in cases of any doubt foetal ultrasound was performed on second postoperative day. Patients were followed up for their disease and out come of the pregnancy, including maternal and foetal mortality and morbidity.

RESULTS

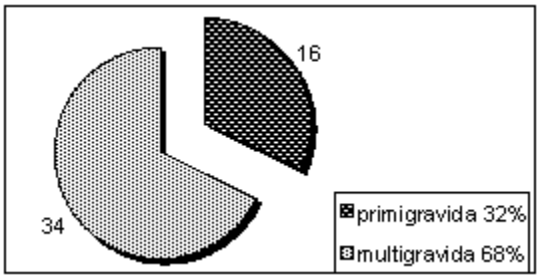
Over a period of thirty months, 50 patients were selected for this prospective study, where follow up was possible in postoperative period. The mean age was 26.5 years (range: 19–36 years) (Table-1).

Table-1: Age frequency

Age	No. of patients	Percentage
19-25	7	14
26-30	34	68
31-36	9	18

Out of these 50 patients, 16 were primi-gravida and 34 were multi-gravida, with no history of acute abdomen during previous pregnancies (Figure-1).

Figure-1: Parity of patients:



Most of these patients were in their second trimester (n= 26), followed by first trimester (n= 19) and third trimester (n= 5). Table-2.

Table-2: Duration of pregnancy

Trimester	No. of Patients	Percentage
First	19	38

Second	26	52
Third	5	10
Total	50	100

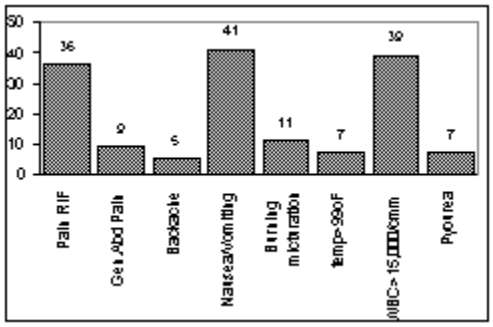
All the patients had history of pain abdomen, pain right iliac fossa was observed in 36 (72%) patients, vague generalized abdominal pain was encountered in 9 (18%) patients and backache was observed in 5 (10%) patients. 41 patients had history of nausea and vomiting, 11 had associated burning micturation, 7 had temperature of more than 99 ºF. Thirty-nine patients had WBC count of more than 15,000/cmm and 7 patients had more than 20 pus cells in urine examination (Figure-2).

All the patients under went laparotomy; in 43 (86%) patients the operative findings supported the clinical diagnosis of acute appendicitis whereas in 7 (14%) patients the results of the laparotomy were negative (Table-3).

Table-3: Results of Surgery

Results	No. of Patients	Percentage
Positive laparotomy	43	86
Negative laparotomy	7	14
Total	50	100

Figure-2: Presentations



All the patients were followed up for the out come of surgery in terms of symptomatology and out come of pregnancy in terms of preterm labour and maternal and foetal mortality and or morbidity. Four of these patients had preterm labour, two weeks before the expected date and all were in their third trimester at the time of surgery. There was no mortality and or morbidity noted in mother during labour, unfortunately the foetal mortality rate was 14% (n= 7) and foetal morbidity was noted in 4 cases with the babies having low birth weight (Table-4).

Table-4: Outcome of Surgery

Outcome	No. of Cases	Percentage
Maternal mortality	0	0
Maternal morbidity	4 (preterm labour)	8
Foetal mortality	7	14
Foetal morbidity	4 (low birth weight)	8

DISCUSSION

Acute appendicitis is the commonest non-gynaecological surgical problem occurring during pregnancy[9], with an estimated frequency of one case of acute appendicitis per 1500 pregnancies[10]. The incidence of appendicitis is unchanged in pregnancy, but the clinical presentation becomes even more variable[11]. During pregnancy the appendix migrates in a counter-clockwise direction toward the right kidney, rising above the iliac crest at about 4.5 months gestation. Right lower quadrant pain and tenderness dominate in the first trimester, but in the latter half of pregnancy, Right Upper Quadrant (RUQ) or right flank pain must be looked upon as a possible sign of appendiceal inflammation. Nausea, vomiting, and anorexia are common in uncomplicated first trimester pregnancies, but their reappearance later in gestation should be viewed with suspicion[12]. The studies of Baer *et al*[4] in 1932 are well known, showing the migration of the appendix progressively upwards in right lower and upper quadrants through the pregnancy. This migration shifts the point of maximum tenderness and also obscures the classical sign of rebound tenderness[13]. The WBC counts increases normally during pregnancy and can reach levels of 16,000/cmm, therefore, a leukocytosis must be interpreted carefully[14].

Acute appendicitis can occur at any point during gestation but is most common in the first and second trimesters[6]. According to a study conducted at Saudi Arabia[15], there were 10 (19%) patients who presented in the first trimester, 31 (60%) second trimester, 8 (15%) third trimester and 3 (6%) patients in the puerperium. Our results match with these results since most of the patients presented in second trimester 52% (n= 26), followed first trimester in 38% (n= 19) and third trimester 10% (n= 5). Due to difficulty in clinically diagnosing acute appendicitis, the negative laparotomy rate is much higher in the pregnant than the non-pregnant patients[16,17]. An accepted rate of normal appendices in non-pregnant patients undergoing laparotomy for suspected appendicitis is 15%. This has been much higher in pregnant patients, with larger series having a misdiagnosis rate between approximately 20% and 35%[10]. Similarly according to the study by Masters *et al*[16], the rate of positive laparotomy was 81% and that of negative was 19%.

Our present study correlates with all these studies as we have 86% positive laparotomy and 14% negative laparotomy. It may, however, be important to have a higher negative laparotomy rate in pregnant patient with suspected appendicitis secondary to the grave consequences of missing the diagnosis. The foetal mortality increases dramatically if perforation occurs or appendicluar abscess develops. Foetal loss occurs in 3% to 5% of cases of acute appendicitis but increases to 20% with perforation and abscess[18]. An aggressive surgical approach is therefore justified. In two separate large institutional reviews, non-obstetric intra-abdominal surgery was reported to have a frequency of 1in 451 to 1 in 635 deliveries[2,8]. Both series confirmed that intra abdominal surgery during pregnancy carries an acceptable risk to both the mother and the foetus and that complications are related to disease severity and operative delay rather than the operative procedure itself[2]. Overall risk of preterm labour has been reported to be between 4% to 6% with pelvic or lower abdominal surgery[19,20], others have reported this risk to be 15% to 20%[2] even up to 38%[8], our study shows preterm labour in 8% of patients and foetal mortality of 14 %, which obviously correlates with international and local[21] series.

CONCLUSION

From this study, we conclude that: (1) misdiagnosis of appendicitis in pregnancy is comparable to that in the general female population; (2) foetal mortality is minimal with early operation before perforation (3) clinical judgment rather than laboratory remains the gold standard for the diagnosis; and (4) the pregnant patient presenting with abdominal pain should be assessed and treated as one would any patient with the same complaint, i.e., unnecessary delay should be avoided as it is directly related to maternal and foetal morbidity and mortality. The general use of this principle may explain the marked improvement in maternal and foetal mortality and morbidity in recent years.

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Address for Correspondence and Reprints:
Dr. Abbas Ghazanfar. East Surgical Unit. Mayo Hospital Lahore. Pakistan.

Email: ag_ali@yahoo.com