

ACUTE ABDOMEN IN PREGNANCY: ARE TOCOLYTICS AND EARLY SURGICAL INTERVENTION JUSTIFIED?

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Acute abdomen in pregnancy due to nonobstetric causes is accompanied by a high incidence of poor fetal outcome and maternal morbidity.^{1,2} Delay in surgical intervention, together with the operative maneuvers, are the main causes of the poor outcome.³⁻⁵ Fear of the complication of a negative laparotomy in a pregnant female makes surgeons hesitant to interfere surgically, leading them to await clear-cut symptoms and signs of acute abdomen.^{5,6} In pregnancy, these symptoms and signs are blunted by the anatomical displacement of the pregnant uterus⁷ and the masking effect of the physiological symptoms of normal pregnancy, such as nausea, vomiting, mild abdominal pain and constipation.^{8,9} Ironically, this delay, when prolonged, carries a high risk to the mother and fetus.⁴ In acute abdomen in pregnancy, some have advocated aggressive early surgical intervention,¹⁰⁻¹¹ while others have adopted an initial trial of conservative treatment before resorting to surgery in case of failure.^{4,12} Tocolytics are thought to calm the uterus from the insult of acute abdomen during conservative management or surgery, but this is controversial.^{13,14} The purpose of this article is to discuss the high incidence of acute abdomen, the effect of early surgical intervention on the maternal fetal health, and to evaluate the effect of tocolytics on pregnancy outcome.

Subjects and Methods

All cases of acute abdomen in pregnancy due to non-obstetric causes that were admitted to Asir Central Hospital (the main referral hospital in the region) from January 1991 to December 1993 were studied and analyzed. The parameters examined included the gestational age, acute abdomen symptoms and their duration before admission, signs, results of investigations, including ultrasound scanning, provisional diagnosis, the initial management plan (whether conservative or surgery

and the criteria for either), tocolytic used, its nature, dose, side effects and its effects on the fetal outcome, and whether abortion, preterm or term labor. Maternal morbidity was assessed by the duration of hospital stay, recurrent hospital admission, body temperature, nature of operation, postoperative complications and maternal health after delivery or abortion. The results of ultrasound scan and histopathology were compared to operative findings. The newborn charts were reviewed and any neonatal abnormality recorded.

The chi-squared test, Fisher's exact test, and unpaired Student's *t*-test were used as tests of significance at the 5% level. For this purpose the software Statistical Package for Social Sciences (SPSS) was used.

Results

During the study period, there were 15,562 deliveries, of which 60 cases were provisionally diagnosed and admitted as having acute abdomen with pregnancy. The symptoms were severe abdominal pain, vomiting, constipation and signs of abdominal distension, rigidity, tenderness, abdominal mass, high temperature and rapid pulse. Table 1 summarizes the frequency of symptoms and signs.

Depending on the severity of the above symptoms, patients were either operated on or were conservatively managed. Out of the 60 cases admitted, 41 (68%) were operated on within one week, and 19 (32%) improved on conservative management and were ultimately discharged. Out of this number, five were free of symptoms until delivery, but 14 patients had repeated admissions with an average of four admissions and a mean hospital stay of 13±1.6 days. Of the 14 cases, four had laparotomy later during pregnancy, three for gallstones and one for an ovarian cyst. The remaining 10 patients reached term without the need for laparotomy, in spite of the readmissions. Generally, the perinatal outcome was better ($P<0.02$), and maternal morbidity less ($P<0.05$) in those who had surgery compared to those under conservative management (Table 2).

Tocolytics were used to prevent abortion and preterm labor. Thirty-two cases were given a tocolytic prophylactically, and 28 cases (46.67%) received no
TABLE 1. Distribution of the 60 cases of acute abdomen in pregnancy according to symptoms and signs.

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Clinical presentation	No.	%
Symptoms		
Abdominal pain	49	82
Nausea and vomiting	38	63
Constipation	19	32
Signs		
Tachycardia	49	82
Pyrexia	45	75
Abdominal rigidity	31	52
Abdominal distension	28	47
Abdominal mass	5	8
Uterine contractions	6	10

TABLE 2. Comparison of perinatal outcome and maternal morbidity after surgical and medical treatment of acute abdomen in pregnancy.

Complications	Surgery n=41	Conservative n=19	Significance
Perinatal outcome			
Preterm labor	5 (12.2%)	8 (42.1%)	$P=0.013$
Abortion	2 (4.9%)	3 (15.8%)	$P=0.177$ NS*
Total	7 (17.1%)	11 (57.9%)	$P=0.0013$
Maternal morbidity			
Emergency surgery	–	4 (21.1%)	$P=0.008$
Relapse with hospital stay	–	10 (52.6%)	$P<0.0001$
Average hospital stay (days)	6±1.2	13±1.6	$t=18.87$ $P<0.0001$
Average no. of admissions	1±0.1	4±0.3	$t=57.92$ $P<0.0001$

*NS=not significant.

tocolytics, as two obstetricians had doubts about their efficacy in acute abdomen. Of the 32 patients who received a tocolytic, 19 (54%) had a favorable fetal outcome of a living term baby, and the remaining 13 patients (40.6%) had an unfavorable fetal outcome (five abortions and eight preterm deliveries, of whom two died neonatally). Of the 28 patients who did not use a tocolytic, 11 had an unfavorable fetal outcome (six abortions and five preterm deliveries), and the remaining seven patients completed their pregnancy uneventfully. The frequency of unfavorable fetal outcome among users of tocolytics (40.6%) was not significantly different from that of non-users (39.3%). Users and non-users of tocolytics had a similar risk rate of developing a poor fetal outcome ($P<0.05$). Table 3 illustrates the perinatal outcome of different tocolytics. Unfavorable fetal outcome is directly proportional to delay in reporting to hospital. The incidence of acute abdomen is almost the same in the first, second and third trimester, being 19, 20 and 21 cases, respectively. The unfavorable fetal outcomes in the first, second and third trimester consisted of 7 (37%), 11 (55%), and 9 (43%), respectively. There were more cases of unfavorable fetal outcome in the second trimester.

There was a high incidence of misdiagnosis, especially in the appendix group. Of the 37 removed appendices, 18 (48%) were found to be normal. The index of misdiagnoses was less in acute cholecystitis and ovarian cysts, as the ultrasound predictive value was high in these two conditions. Table 4 summarizes the incidence of incorrect provisional diagnosis.

Discussion

The incidence of acute abdomen among women who delivered in our hospital during the study period was 0.39%. Compared to the findings of Babaknia et al.,³ and Saunders and Milton,⁵ who reported incidences of 0.23% and 0.001%, respectively, and an average incidence rate of 0.06%, our incidence rate was high. The high incidence rate has a multifactorial etiology. Early marriage before the peak age for appendicitis, which is the most common cause of acute abdomen in this and other studies, and repeated pregnancies in this population, going on well into advanced age, gives a higher probability for acute abdomen occurring during a pregnancy cycle.¹⁶ Another reason for the high incidence is the prevalence of biliary diseases, which constitute 27% of acute abdomen cases in this series. In a recent study, 7.5% of pregnant women in this population were found to harbor silent gallstones,¹⁷ in comparison to 3.5% in the West. The high incidence of biliary disease could be genetic, as suggested by Mofti et al.,¹⁹ as the genetic constitution of this society is well preserved by consanguinity. Early marriages with repeated pregnancies¹⁶ and the well-documented deleterious effects of pregnancy on the biliary system are other possible causes.^{20,21} Most of the women in this society are obese and live a sedentary life with a diet rich in fat and carbohydrates.

The early symptoms of an acute abdomen resemble the common symptoms of pregnancy, such as nausea, vomiting, mild abdominal pain and constipation, and it is this resemblance which precludes the possibility of a definitive early diagnosis. The anatomical displacement of the intra-abdominal organs by the enlarged uterus, especially the appendix and the omentum as they are being pushed away,⁷ the stretched peritoneum and the pregnant uterus, all make an informative deep abdominal palpation a difficult task for the patient and the surgeon. This masking of symptoms and blunting of signs leads to a situation of clinical uncertainty, which makes surgeons await confirmatory signs,²⁴ or operate and accept the possibility of negative laparotomy²⁴ with its possible intraoperative difficulties and postoperative complications of maternal and fetal health. Ironically, when symptoms and signs clearly indicate ending conservative management and embarking on surgery, as often happens when some cases present late, the peritonitis may have spread uncontrollably, as the omentum has little space to move and localize the infection. Nothing is worse for the perinatal outcome and maternal health than peritonitis during pregnancy.²⁵ In this surgical dilemma, the surgeon may fear intervening and triggering unnecessary uterine contractions, or consider prolonging the hospital stay, which is unpredictable and costly.

TABLE 3. Effect of individual tocolytic, all tocolytics and no tocolytic on fetal outcome.

Tocolytic	No. of cases	Abortion	Preterm labor	Term labor
Ritodrine	13	–	6	7

Progesterone	8	1	2	5
Calcium channel blocker	4	1	1	2
Anti-prostaglandin	7	1	1	5
All tocolytics	32 (53.3%)	5	8	19 (59.41%)
No tocolytic	28 (47.71%)	6	5	17 (40.6%)

TABLE 4. Percentage of misdiagnoses in acute abdomen during pregnancy.

Diagnosis	Provisional	Final	% misdiagnoses
Appendicitis	30	18	40
Cholecystitis	12	11	8.4
Ovarian cyst	6	5	16.7
Fibroid	4	3	25
Intestinal obstruction	5	5	0
Other (unknown diagnosis)	3	–	100

Although early surgical intervention may have resulted in negative laparotomies in this study, as seen from the high incidence of misdiagnosis (Table 4), it definitely resulted in a significantly better fetal outcome and better maternal health (Table 2).

Prophylactic tocolytics were thought by some to help in this situation by calming the uterus during conservative management or surgery, but from the above study they were not as beneficial as has been reported by other authors.^{13,14} Tocolytics such as ritodrine and prostaglandin synthase inhibitors affect the clinical picture. Ritodrine leads to rapid pulse and vomiting, so it masks some important clinical findings.²⁶ Prostaglandin synthase inhibitor, as it is an anti-inflammatory and antipyretic, might lead to a false sense of case improvement, as well as some fetal side effects, such as persistence of a patent ductus arteriosus, oligohydramnios and necrotizing enterocolitis.^{27,28} There could be a place for early administration of tocolytics after the definitive diagnosis, and prostaglandin synthase inhibitors have fewer side effects than ritodrine. Progestogens are almost devoid of side effects²⁹ and calcium channel blockers require further study.²⁶

The fetal outcome is in greater jeopardy when acute abdomen occurs in the second trimester, as reported in this study. The uterus is too big to be safely manipulated during surgery, unlike the small first trimester uterus, and when the delivery occurs in the second trimester, the newborn is usually too premature to survive.

In conclusion, we found a higher incidence of acute abdomen in pregnancy in this study than has been found in others, but it is apparent that the cardinal signs and symptoms for a definite diagnosis are blurred by the disturbed physiology and the anatomic displacement of intra-abdominal organs. Tocolytics are not only ineffective but may have serious side effects, and failure to take prompt action in such adverse conditions will be

deleterious to the mother and the fetus. From the results of this study, it is advisable to operate as soon as acute abdomen is suspected, accepting negative laparotomies rather than operating on a moribund patient and endangering the life of the mother and fetus. Early surgical intervention shortens the hospital stay and improves the fetal outcome, as is evident from the results of this study.

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