

Pancreatitis in pregnancy: etiology, diagnosis, treatment, and outcomes

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BACKGROUND: Acute pancreatitis in pregnancy is a rare and dangerous disease. This study aimed to examine the etiology, treatment, and outcomes of pancreatitis in pregnancy.

METHOD: A total of 25 pregnant patients diagnosed with pancreatitis during the period of 1994 and 2014 was analyzed retrospectively.

RESULTS: The pregnant patients were diagnosed with pancreatitis during a period of 21 years. Most (60%) of the patients were diagnosed with pancreatitis in the third trimester. The mean age of the patients at presentation was 25.7 years, with a mean gestational age of 24.4 weeks. Abdominal pain occurred in most patients and vomiting in one patient was associated hyperemesis gravidarum. The common cause of the disease was gallstone-related (56%), followed by alcohol-related (16%), post-ERCP (4%), hereditary (4%) and undetermined conditions (20%). The level of triglycerides was minimally high in three patients. ERCP and wire-guided sphincterotomy were performed in 6 (43%) of 14 patients with gallstone-related pancreatitis and elevated liver enzymes with no complications. Most (84%) of the patients underwent a full-term, vaginal delivery. There was no difference in either maternal or fetal outcomes after ERCP.

CONCLUSIONS: Acute pancreatitis is rare in pregnancy, occurring most commonly in the third trimester, and gallstones are the most common cause. When laparoscopic cholecystectomy is not feasible and a common bile duct stone is highly suspected on imaging, endoscopic sphincterotomy or stenting may help to prevent recurrence and postpone cholecystectomy until after delivery.

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Introduction

Pancreatitis in pregnancy is a rare condition estimated to occur in 1 in 1000 to 1 in 12000 pregnancies and can cause serious morbidity for both mother and fetus. Pancreatitis during pregnancy usually occurs as a result of gallstone disease and less often from alcohol or hyperlipidemia. In the past, acute pancreatitis during pregnancy resulted in a high incidence of maternal morbidity and neonatal death after premature birth, but advances in diagnostic imaging and neonatal intensive care have improved prognosis in recent years. Reports^[1, 2] suggested that patients with pregnancy-related pancreatitis is most common in the third trimester and postpartum period. The present study was undertaken to examine the causes, treatment, and factors associated with adverse outcomes of acute pancreatitis in pregnancy.

Methods

This study was approved by the institutional review board, with waiver of informed consent. The author retrospectively reviewed pregnant patients diagnosed with pancreatitis during the period of January 1994 to December 2014. The patients with pancreatitis were identified using International Classification of Disease version 9 (ICD-9) codes in the Marshfield Clinic electronic medical record, attempting to exclude tumor-related pancreatitis although nothing was identified. Manual data included age at diagnosis, trimester of pregnancy, demographic characteristics, clinical presentation, causes of pancreatitis (e.g., gallstones, alcohol consumption, hypertriglyceridemia, and idiopathic factors), laboratory values (e.g., serum amylase, lipase, and liver enzymes). Four parameters were also examined to determine the

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presence of systemic inflammatory response syndrome [i.e. temperature $>38.3\text{ }^{\circ}\text{C}$ or $<36\text{ }^{\circ}\text{C}$, respiratory rate >20 breaths per minute, heart rate >90 beats per minute, and white blood cell count $>12\ 000/\mu\text{L}$ or $<4\ 000/\mu\text{L}$ or $>10\%$ immature (band) forms]. If there were ≥ 2 criteria, severe pancreatitis was considered. Moreover, the following data were collected: ultrasound findings, endoscopic retrograde cholangiopancreatography (ERCP) findings, procedures done during ERCP, treatments given (e.g., parenteral nutrition), cholecystectomy (before, during, or after pregnancy), admission to the intensive care unit, maternal complications (e.g., preterm delivery, preeclampsia and eclampsia, emergent Cesarean delivery), neonatal complications (e.g., fetal demise, admission to intensive care unit), and recurrence of symptoms during pregnancy. Apgar scores of infants at 1 and 5 minutes were collected, and patients who underwent ERCP were compared with those who did not. The data collected from the medical record were retrospectively analyzed. The *P* values for the Apgar scores were calculated using Wilcoxon's rank-sum test.

Results

Over the 21-year period from January 1, 1994 through December 31, 2014, there were 25 pregnant patients diagnosed with pancreatitis, of which 5 (20%) were diagnosed in the first trimester, 5 (20%) in the second trimester, and 15 (60%) in the third trimester. Their mean age at presentation was 25.7 [standard deviation (SD) 5.3] years, ranging from 19 to 39 years. The mean gestational age at occurrence was 24.4 (SD 9.9) weeks, ranging from 6 to 41 weeks. Approximately 76% of the patients were multiparous, and 24% were nulliparous (6 patients were diagnosed during their first pregnancy, 10 during their second, and the rest in their third through sixth pregnancies). The disease was acute in most (64%) of the patients and acute-on-chronic in 9 (36%).

Twenty-one of the 25 patients presented with abdominal pain, and twelve were associated with vomiting. Vomiting alone appeared in two patients (hyperemesis gravidarum in one and syncope in one). Gallstone-related pancreatitis was seen in 14 (56%) patients, alcohol-related in 4 (16%), post-ERCP in 1 (4%), hereditary in 1 (4%), and undetermined in 5 (20%). The etiology of pancreatitis and trimesters of the patients at diagnosis are shown in Table 1.

Amylase levels ranged from 18 to 7845 U/L, with an average of 1121 U/L. Lipase levels ranged from 15 to 5325 U/L with an average of 1674 U/L. The level of triglycerides was minimally elevated in 3 patients: two with gallstone-related pancreatitis and one with alcohol-related

pancreatitis. One patient with alcohol-related pancreatitis met two criteria positive for systemic inflammatory response syndrome, suggesting severe pancreatitis.

All the patients underwent abdominal ultrasound, and one patient with gallstone-related pancreatitis was subjected to magnetic resonance imaging (MRI) of the abdomen. Of the 14 patients with gallstone-related pancreatitis, 6 (43%) with elevated levels of liver enzymes underwent ERCP and wire-guided endoscopic sphincterotomy without complications (5 patients diagnosed in the third trimester, and 1 in the second trimester). All patients were treated with intravenous hydration and bowel rest, and only 2 (8%) patients received parenteral nutrition. Symptoms were improved in 21/25 patients within 24-72 hours after treatment with enteral nutrition. One patient was admitted to the intensive care unit for associated anemia requiring transfusions.

Most patients (21/25, 84%) with pancreatitis proceeded to a full-term vaginal delivery (18 began labor spontaneously and 3 were induced). Of those who did not, Cesarean delivery was performed in two patients with gallstone-related pancreatitis, including one as emergent post-ERCP Cesarean delivery for pancreatitis, and one was done for acute pancreatitis. Of patients who underwent Cesarean delivery, two were in patients with alcohol-related pancreatitis. Recurrent pancreatitis occurred in 3 patients, one with alcohol-related severe pancreatitis and 2 with gallstone-related mild pancreatitis. Maternal outcomes like preterm delivery and Cesarean delivery in the mother and development of complications like preeclampsia and eclampsia were recorded. None of the patients had preeclampsia or eclampsia. Neonatal birth weights were available in 13 patients, ranging from 5 pounds, 12 ounces to 7 pounds, 6 ounces. The average birth weight was 6 pounds, 7 ounces. Apgar scores were available in 10 patients. In 5 patients who had ERCP, the average Apgar score of infants was 8.2 at 1 minute and 9.4 at 5 minutes. In 5 patients who did not undergo ERCP, the scores were 8.2 at 1 minute and 9.0 at 5 minutes. None of the infants were transferred to the neonatal intensive care unit after delivery. Tables 2 and 3

Table 1. Etiological diagnosis of pancreatitis by trimesters

Etiology	First trimester (5/25, 20%)	Second trimester (5/25, 20%)	Third trimester (15/25, 60%)
Gallstone-related (<i>n</i> =14)	3	1	10
Alcohol-related (<i>n</i> =4)	1		3
Post-ERCP (<i>n</i> =1)			1
Hereditary (<i>n</i> =1)		1	
Undetermined (<i>n</i> =5)	1	3	1

ERCP: endoscopic retrograde cholangiopancreatography.

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