

## Pancreatic Necrosis Associated with Preeclampsia-Eclampsia

Malvinder S Parmar

Department of Medicine, University of Ottawa. Ottawa, Canada

### ABSTRACT

**Context** Acute pancreatitis during pregnancy is rare and commonly occurs in association with biliary disease. Preeclampsia is associated with microvascular abnormalities that may involve cerebral, placental, hepatic, renal and splanchnic circulation and rarely can cause acute pancreatitis.

**Case report** A case of acute pancreatitis in a patient with preeclampsia-eclampsia where the diagnosis was missed initially that resulted in a protracted course and development of organized pancreatic necrosis. The pancreatic necrosis resolved with conservative management over 8 weeks.

**Conclusions** The development of severe hypoalbuminemia, out of proportion to proteinuria, hypocalcemia and findings of capillary leak should alert the physician to search for other inflammatory causes, including acute pancreatitis so that early and effective management be given to avoid complications.

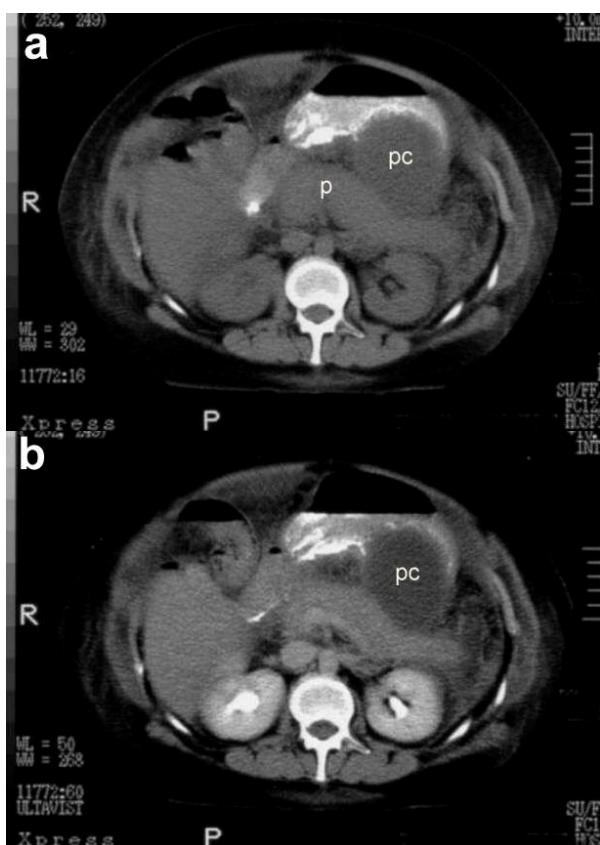
### INTRODUCTION

Acute pancreatitis during pregnancy is commonly secondary to biliary disease [1] and is rarely associated with pre-eclampsia-eclampsia [2]. Preeclampsia is associated with microvascular abnormalities that may involve cerebral, placental, hepatic, renal and splanchnic circulation. A case of severe pancreatitis resulting in organized pancreatic

necrosis associated with preeclampsia-eclampsia and the review of literature are presented.

### CASE REPORT

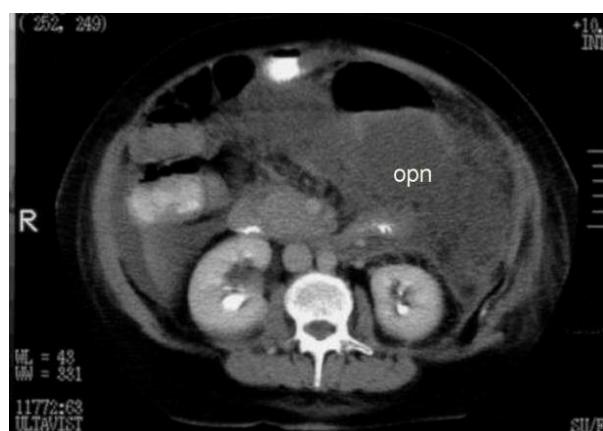
A 30-year old nulliparous woman was admitted at 37<sup>th</sup> week of gestation with gestational hypertension and preeclampsia. Her pregnancy was uneventful until two weeks before admission. In the last two weeks, she noticed increasing leg swelling and gained 10-pounds, had mild headache and elevated blood pressure of 170/100 mmHg. Physical examination was remarkable for 2+ pitting edema of lower extremities, fundus examination was unremarkable and reflexes were 2+ and symmetrical. Investigations on admission showed normal white cell count of 8.3 (reference range: 4.0-11.0  $\times 10^9/L$ ), normal electrolytes, normal BUN of 3.0 mmol/L (reference range: 1.7-8.3 mmol/L), serum creatinine of 107  $\mu\text{mol}/L$  (reference range: 35-97  $\mu\text{mol}/L$ ), elevated uric acid of 530  $\mu\text{mol}/L$  (reference range: 143-339  $\mu\text{mol}/L$ ), elevated AST of 97 IU/L (reference range: 0-31 IU/L), ALT of 83 IU/L (reference range: 0-31 IU/L), ALP of 563 IU/L (reference range: 39-117 IU/L) and low serum albumin of 26 g/L (reference range: 35-50 g/L). Urine was negative for protein on pre-natal examinations and on admission. A 24-hour urine collection showed urine protein of 0.24 g/day. She underwent cesarean section two days later because of progressive toxemia. She received intravenous fluids, cephazolin 1 g every 8-h for 24 hours after cesarean section, intramuscular toradol 30 mg every 4-



**Figure 1.** CT scan of the abdomen without (1a) and with (1b) intravenous contrast showing collection in the lesser sac. (p: pancreas; pc: peri-pancreatic collection)

6 hour, as required (and received 9 doses in 48 hours) and epidural morphine, as required. Postoperatively she developed low-grade fever with temperature of  $37.2^{\circ}\text{C}$ , chills and complained of abdominal bloating, central abdominal discomfort and developed generalized anasarca with further drop in serum albumin to 17 g/L. There was mild perumbilical tenderness without any abdominal rigidity, rebound or peritoneal signs. Lungs were clear with decreased breath sounds at bases. Heart examination was remarkable for soft ejection systolic murmur. There was 2-3+ pitting edema of both lower extremities and flanks. She developed acute oliguric renal failure and serum creatinine increased to 150  $\mu\text{mol}/\text{L}$  from 57  $\mu\text{mol}/\text{L}$ . Her hemoglobin was low at 97 g/L (reference range: 120-160 g/L), white cell count was slightly high at 15.9 with normal platelet count. D-dimer increased to 4.0  $\mu\text{g}/\text{mL}$  from 2.0  $\mu\text{g}/\text{mL}$  on admission (reference range: 0-

0.255  $\mu\text{g}/\text{mL}$ ). Spot urine sodium was less than 10 mmol/L (reference range: 0-300 mmol/L) with urine chloride of 10 mmol/L (reference range: 0-300 mmol/L), confirming intravascular 'effective' volume depletion despite generalized anasarca secondary to hypoalbuminemia. Chest X-ray showed bibasal atelectasis and bilateral pleural effusion. It was felt that low grade temperature, mild perumbilical discomfort, bibasal atelectasis, mild leucocytosis, elevation in d-dimer were related to her post-surgical state. The acute renal failure was felt to be secondary to pre-renal azotemia secondary to effective volume depletion and to some extent aggravated by the use of toradol, especially in a volume depleted patient. The toradol was discontinued and patient was given intravenous albumin for 48-hours to expand circulatory volume and to mobilize fluid from the third space and a day later her urine output improved and serum creatinine returned to her baseline at 37  $\mu\text{mol}/\text{L}$  within 48-hours. She had low serum calcium of 1.43 mmol/L (corrected 1.91 mmol/L; reference range: 2.02-2.6 mmol/L) with low ionized serum calcium of 0.81 mmol/L (reference range: 1.15-1.29 mmol/L) that was corrected with intravenous calcium supplementation. However, she continued to have low grade temperature with mild perumbilical discomfort without rigidity or rebound tenderness. CT scan of abdomen (7-days after admission) showed collection in the



**Figure 2.** CT scan of the abdomen with intravenous contrast 2-weeks after initial scan. (opn: organized pancreatic necrosis)

pancreatic area (Figures 1 and 2). There were no gallstones. She was diagnosed with pancreatic necrosis from 'missed' episode of acute pancreatitis. Pancreatitis was not suspected initially and serum amylase or lipase was not performed at the time of admission. However, serum amylase was normal at 86 IU/L and 47 IU/L (reference range: 0-100 IU/L), on 4<sup>th</sup> and 7<sup>th</sup> day after the onset of symptoms. In retrospect, the prolonged post-op course with ileus, vague abdominal discomfort with mild tenderness, marked hypoalbuminemia and hypocalcemia were likely secondary to severe acute pancreatitis that was not suspected initially. She recovered fully with resolution of pancreatic necrosis with conservative management. The serum cholesterol and triglycerides checked after the episode were normal.

## DISCUSSION

Acute pancreatitis complicates one in 1,000 to 3,000 deliveries [1]. Pregnancy in a nulliparous woman was once regarded as a specific predisposing condition for pancreatitis but this concept was refuted [3, 4] and a recent review reported pancreatitis during pregnancy in about 3/4 (72%) of multiparous women [1] and can occur during any trimester but over 1/2 (52%) occur during the third trimester and rarely during post-partum period [1]. Gallstone disease and alcohol abuse are the common causes and accounts for 80% of total cases of acute pancreatitis in a non-pregnant patient, however gallstone disease is the commonest cause [1, 3, 4] and accounts for 67-100% of cases during pregnancy. Pregnancy increases serum cholesterol and triglyceride levels, increases bile stasis, and thus may induce gallstone formation. However, hyperlipidemia may directly induce acute pancreatitis. Ischemia (shock, vasculitis, etc.) may induce pancreatitis. Preeclampsia-associated pancreatitis can occur but is very rare [2, 5]. In a recent review [1], none of the 43 women had preeclampsia-associated pancreatitis whereas an older review [4] reported 9 of 98

cases of preeclampsia-associated pancreatitis but 5 of those received diuretics and another case reported recently also received diuretic [5]. Diuretics can induce pancreatitis [6, 7]. In the patient described the diagnosis of pancreatitis was missed initially and first made by CT scan that was performed 7-days after the onset of symptoms and amylase levels checked on 4<sup>th</sup> and 7<sup>th</sup> day after the symptoms started were within normal limits. Serum lipase was not performed. However, the presence of organized pancreatic necrosis [8] highly suggests that symptoms, marked hypoalbuminemia, hypocalcemia occurring in the immediate peri-partum period were secondary to severe episode of acute pancreatitis. It is possible that the pancreatitis started before delivery but there were no symptoms of nausea, vomiting, abdominal pain and her initial calcium level was normal. There were no gallstones, her cholesterol and triglycerides levels were normal and there was no episode of hypotension or evidence of ischemia or vasculitis and no diuretics were used.

Preeclampsia is associated with microvascular abnormalities that may involve cerebral, placental, hepatic, renal and splanchnic circulation. It is likely that pancreatic vasculature was also altered and caused acute pancreatitis that resulted in organized pancreatic necrosis.

In conclusion, a case of peri-partum pancreatitis associated with preeclampsia-eclampsia is presented where initial diagnosis was missed and resulted in pancreatic necrosis. The severe hypoalbuminemia - out of proportion to the degree of proteinuria, hypocalcemia and generalized anasarca - as seen in this patient, should alert the physician to look for other inflammatory conditions that can result in capillary leak syndrome, including acute pancreatitis so that early and effective management be considered and complications could be avoided.

---

Received January 10<sup>th</sup>, 2004 - Accepted January 19<sup>th</sup>, 2004

**Keywords** Pancreatitis; Pancreatitis, Acute Necrotizing; Pre-Eclampsia; Pregnancy; Pregnancy Complications

**Correspondence**

Malvinder S Parmar

Suite 108  
707 Ross Ave. East  
Timmins, ON  
Canada P4N 8R1  
Phone: +1-705.268.8066  
Fax: +1-705-268.8066  
E-mail address: parmar@vianet.on.ca

---

**References**

1. Ramin KD, Ramin SM, Richey SD, Cunningham FG. Acute pancreatitis in pregnancy. Am J Obstet Gynecol 1995; 173:187-91. [PMID 7631678]
2. Badja N, Troche G, Zazzo JF, Benhamou D. Acute pancreatitis and preeclampsia-eclampsia. Am J Obstet Gynecol 1997; 176:707-9. [PMID 9077633]
3. Corlett RC Jr, Mishell DR Jr. Pancreatitis in pregnancy. Am J Obstet Gynecol 1972; 113:281-90. [PMID 4637016]
4. Wilkinson EJ. Acute pancreatitis in pregnancy: a review of 98 cases and a report of 8 new cases. Obstet Gynecol Surg 1973; 28:281-303. [PMID 4614151]
5. Marcovici I, Marzano D. Pregnancy-induced hypertension complicated by postpartum renal failure and pancreatitis: A case report. Am J Perinatology 2002; 19:177-179. [PMID 12012278]
6. Wilmink T, Frick TW. Drug-induced pancreatitis. Drug Saf 1996; 14:406-423. [PMID 8828018]
7. Greenberg A. Diuretic complications. Am J Med Sci 2000; 319:10-24. [PMID 10653441]
8. Bradley EL 3rd. A clinically based classification system for acute pancreatitis. Summary of the international symposium on acute pancreatitis, Atlanta, GA, September 11 through 13, 1992. Arch Surg 1993;128:586-90. [PMID 8489394]