

Acute Pancreatitis Associated with Rotavirus Infection

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We report the first documented case of pancreatitis associated with rotavirus infection in an infant. Estimation of amylase level is important in infants with severe rotavirus gastroenteritis, hyperamylasemia should alert one to the presence of overt pancreatitis which should be investigated by lipase estimation and/or imaging.

Keywords: Amylase, Computed tomography, Infant, Pancreatitis, Rotavirus.

Hyperamylasemia during gastroenteritis is relatively frequent, but overt pancreatitis is rare(1). Association of pancreatitis is rare with rotavirus infection(2,3) and no case is reported below 1 year of age.

CASE REPORT

The infant was referred from a community clinic with diarrhea and severe dehydration. There were no previous medical problems. On arrival, the infant had tachycardia and his activity was poor, with fever (temperature, 38.6°C). He had lost more than 10% of his original body weight. His fontanel and orbits were sunken and his skin turgor was decreased. The abdomen was flat and soft, without hepatosplenomegaly. The laboratory data (**Table I**) were consistent with severe dehydration, and also showed elevated levels of both transaminase and amylase. Stool was positive for rotavirus antigen and negative for adenovirus antigen using the RapidTesta® ROTA-ADENO (Immuno-chromatography kit, Sekisui Medical Co., Ltd., Tokyo, Japan). Abdominal X-ray demonstrated mild nonspecific bowel dilation without free air or portal venous air, whereas chest X-ray findings were normal.

Aggressive fluid-resuscitation was started. The hyperamylasemia was considered to be related to severe gastroenteritis. Investigations on the

following day revealed evidence of recovery from dehydration, but the ALT and AST levels, and hyperamylasemia had increased. Since pancreatitis could not be ruled out, abdominal computed tomography (CT) was performed. CT demonstrated a mildly enlarged edematous pancreas and a small amount of accumulated fluid, but ultrasonography one month later showed that this had normalized for age: pancreatic body 0.75 cm (normal dimension 0.6±0.2 cm). The diagnosis of acute pancreatitis was made on the basis of the elevated pancreatic enzyme values and CT findings.

The patient's condition improved over several days, with gradual normalization of the amylase, lipase, and pancreatic phospholipase A2 levels within 10 days.

DISCUSSION

Acute pancreatitis is less common in children than in adults, and clinical diagnosis in pediatric patients is often challenging(4). In particular, children may not only present with nonspecific symptoms, but hyperamylasemia during gastroenteritis is also relatively frequent(1). Generally, the values of serum amylase, pancreatic phospholipase A2, and lipase are elevated in renal failure. In our patient, the transient renal dysfunction due to severe dehydration would have contributed to the elevation of these

TABLE I LABORATORY DATA

	Reference range	2 days before	On admission	Following day	The 4th day	9 days later
Hemoglobin	10.5-13.5 g/dL	11.7	15.1	10.4	11.4	11.6
Hematocrit	33-39 %	35.3	43.9	31.2	33.8	34.3
TP	6.7-8.3 g/dL	7.1	8.5	5.3	5.8	6.9
AST	10-40 U/L	61	61	135	62	47
ALT	5-40 U/L	58	80	154	108	43
TB	0.2-1.0 mg/dL	0.2	0.2	0.3	ND	<0.1
GGTP	0-47 U/L	11	14	12	ND	12
Amylase	37-125 U/L	32	291	322	60	74
P-PLA2	130-400 ng/dL	ND	2,740	358	ND	164
Lipase	13.6-22.8 U/L	ND	41	35	ND	ND
BUN	4.0-15 mg/dL	14.2	80.3	5.1	1.8	5.3
Cr	0.3-0.6 mg/dL	0.21	1.20	0.17	0.15	0.16
Sodium	136-147 mEq/L	129	152	147	144	139
Potassium	3.6-5.0 mEq/L	3.8	5.5	3.2	4.8	4.7
Triglyceride	25-135 mg/dL	38	ND	181	ND	ND
Blood glucose	60-100 mg/dL	98	155	88	ND	98
CRP	0.0-0.3 mg/dL	0.51	0.40	0.05	0.09	0.05

WBC = white blood cells, TP = total protein, AST = aspartate aminotransferase, ALT = alanine aminotransferase, TB = total bilirubin, GGTP = gamma-glutamyltranspeptidase, P-PLA2 = pancreatic phospholipase A2, BUN = blood urea nitrogen, Cr = creatinine, CRP = C-reactive protein, ND = not done.

values on admission. However, on the second hospital day, the level of serum amylase was higher than on the day of admission, and the level of lipase was still high despite correction of dehydration. Pancreatic imaging by contrast-enhanced CT provides good evidence for the presence or absence of pancreatitis in adults(5). Since there are no CT standards of pancreatic size for children, measurement for this patient was based on standards established in the sonographic literature(6). CT revealed relative pancreatic enlargement for age: pancreatic body 1.3 cm (normal dimension 0.6±0.2 cm), tail 1.3 cm (normal 1.0±0.4 cm), and a small amount of accumulated fluid. Accordingly, this case met the stringent diagnostic criteria for acute pancreatitis in infants(7).

It has been demonstrated experimentally that reoviruses, which belong to the same family as rotaviruses, can produce inflammatory edema with infiltrates of neutrophils and mononuclear round

cells, degranulation of acinar cells, and dissociation of lobules and acini with necrosis(7). In the same way, it was thought that the damage to the pancreatic tissue in this case could have been caused directly by rotavirus infection. However, it is unknown whether rotaviruses reach the pancreas by ascending infection through the pancreatobiliary tree or via a hematogenous route(3, 8). Another hypothesis is that obstruction of pancreatic fluid outflow through an edematous ampulla of Vater might have induced pancreatitis(3), but in this case the laboratory data and CT imaging revealed no evidence of bile flow obstruction or dilatation of the pancreatic duct, respectively.

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