ACUTE PANCREATITIS IN CHILDHOOD

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(RECEIVED FOR PUBLICATION APRIL 16, 1956)

Acute haemorrhagic pancreatitis in childhood is an uncommon disease, so that, although the signs and symptoms are as typical as in the adult when it does occur, it is usually undiagnosed pre-operatively as the possibility has not been included in the differential diagnosis.

When Dobbs (1935) reported a case he found only 14 previous cases in the world literature. Ger (1954) and Boss (1955) have each described one further case.

It is intended therefore to record two further cases and summarize the available information regarding diagnosis, aetiology and treatment.

Case Reports

Case 1. L.C., a girl aged 4 years, was admitted in September, 1954. She had a history of possibly having swallowed a stone while playing in the garden. One hour later she complained of sudden severe epigastric pain and vomiting, in consequence of which she was brought up to the Casualty Department. She appeared pale and slightly shocked and had tenderness and guarding localized to the epigastrium. An upright radiograph did not reveal a radio-opaque foreign body or any air under the diaphragm. She was admitted for observation. Her temperature was 97.8° and pulse 136.

She continued to vomit at frequent intervals and became more shocked with a rising pulse rate. Generalized rigidity with abdominal distension and absent bowel sounds rapidly developed. The urine contained sugar and acetone and the blood sugar estimation was found to be 232 mg. %. The leucocyte count was 20,000 per c.mm. A diagnosis of peritonitis of uncertain origin was made and an immediate laparotomy was decided upon. Gastric suction and intravenous therapy were instituted.

OPERATION. A right mid-paramedian incision was made under general anaesthesia. The peritoneal cavity contained a considerable quantity of opalescent, mildly blood-stained fluid. The whole bowel showed the gross injection associated with peritonitis. All the lacteals in the mesentery were sharply outlined white by engorgement with chyle. The omentum and mesentery showed numerous raised, cream-coloured nodules with an injected surround. These could not be wiped off and were considered to be fat necrosis. Part of the greater

omentum containing such plaques was excised for histology.

No lesion of the alimentary tract itself was found and the gall bladder appeared normal but would not empty on compression. A large oedematous mass was palpated behind the stomach in the situation of the head and body of the pancreas. The oedema also spread forwards into the transverse mesocolon.

A diagnosis of acute haemorrhagic pancreatitis was made and the abdomen closed without further interference or drainage.

PROGRESS. Post-operatively penicillin and streptomycin were given intramuscularly and gastric aspiration and intravenous fluids continued.

It was found that the urinary diastase (estimated by King's method) on urine which had been collected pre-operatively was 160 units per ml. and the serum amylase was 9,600 units %.

For two days her general condition was poor but on the third day bowel sounds returned and her general condition improved. The serum amylase (estimated by King's method) fell to 533 units %. Thereafter she made an uninterrupted recovery. Urine specimens since that time have not contained sugar or acetone and the blood sugar levels have remained normal.

HISTOLOGICAL REPORT. The specimen consisted of a piece of omentum on which were numerous small white plaques. Sections showed many small areas of early fat necrosis. In most areas complete small lobules were degenerate and there was then no cellular reaction. The peritoneum showed some proliferation and scanty infiltration by polymorphs and mononuclear macrophages.

Case 2. E.R., a boy aged $4\frac{1}{2}$ years, was admitted in November, 1955, with a history of persistent vomiting and right-sided abdominal pain for 48 hours, having been off colour with a poor appetite for three weeks and constipated for four days.

The temperature was 100.8° F. and pulse 140. He was ketosed and markedly dehydrated. The abdomen was scaphoid and guarding was maximal in the epigastrium and right upper quadrant but no rebound tenderness was elicited. No mass could be felt and bowel sounds were absent. The white blood count was 23,000 per c.mm. Intravenous and antibiotic therapy was started and laparotomy undertaken. There was considerable free fluid in the peritoneal cavity. Patches of fat necrosis were observed, particularly on the

omentum and a mass 2 by 3 in. was felt in the region of the head of the pancreas. The abdomen was closed without definitive surgery.

Post-operatively probanthine, 15 mg., was given six-hourly and gastric aspiration and intravenous therapy continued. On the day following operation the urinary diastase was 160 units per ml. His improvement was slow over the next week. By the tenth day the serum amylase was still 640 units % and the urinary diastase 60 units per ml. During the subsequent two months the serum amylase fluctuated between 266 and 457 units %.

A barium meal and cholecystogram showed no abnormality and the blood sugar curve was normal. Fat absorption was poor as shown by no detectable iodine in the 12-18 hour specimen after an oral dose of 8 ml. of 'lipiodol'.

These two patients represent the two forms of idiopathic pancreatitis in children, the former the acute type with dramatic onset and rapid resolution, and the latter the more subacute onset with a more protracted course.

Below is a summary of recorded cases with the outcome and suggested aetiology.

in the epigastrium. Incidentally each of these three cases survived.

Roundworm infection seems blameworthy also, as both Herzog's (1929) and Gallie and Brown's (1924) patients vomited roundworms while Novis (1923) operated and removed two worms from the pancreatic duct in his girl. Rigby (1923) and others have reported pancreatitis in adults with roundworms in the pancreatic duct.

Sebening (1925) found a gall stone impacted in the ampulla of Vater in his 13-year-old girl which conforms with the aetiology sometimes found in adults.

Lesions of acute pancreatitis have also been found at necropsy in cases of septicaemia, and possibly the patients of Dobbs (1935), who had a cerebral abscess, and of Mackenzie (1930) with a follicular tonsillitis, come into the same general group caused by septic embolism.

This leaves about half the recorded cases which do not fit in with the above pathologies and any other definite aetiology.

	Age (Years)	Author	Operation	Result	Aetiology
1	2	Herzog (1929)	None. Vomited roundworm terminally	Died 22 hr. after onset	? Roundworm
2	Boy, 2½	Gallie and Brown (1924)	Laparotomy. Vomited roundworm	Recovered	? Roundworm
3	Boy, 3	Holzmann (1927)	Laparotomy	Died	None found
4	Girl, 3	Mackenzie (1930)	None	Died	Had tonsillitis.
5	Girl, 4	Anderson (1923)	None	Died	? Embolic sepsis
6	Boy, 5	Desjardes (1932)	Laparotomy	Died	None found
7	Boy, 7	Hagedorn (1913)	Laparotomy	Recovered	None found
8	7	Phélip (1920)	Laparotomy	Died	Trauma
9	Boy, 10	Dietrich (1932)	Laparotomy	Recovered	None found
10	Girl, 11	Foged (1932)	Laparotomy	Recovered	Trauma
11	Girl, 12	Novis (1923)	Laparotomy. 2 roundworms recovered from chest	Died	None found
12	Girl, 12	Dobrotvinsky (1913)	Laparotomy	Recovered	Roundworm
13	Girl, 13	Vogel (1924)	Laparotomy	Recovered	Trauma
14	Girl, 13	Sebening (1925)	Stone removed from ampulla	Recovered	? Congenital abnormality
15	Girl, 12½	Dobbs (1935)	Laparotomy and drainage	Recovered	Cholelithiasis
16	Girl, 3	Ger (1954)	Laparotomy only	Recovered	? Embolic sepsis from mastoid
17	Boy, 6	Boss (1955)	Laparotomy and drainage	Died	? Trauma
18	Girl, 4½	Haigh	Laparotomy	Recovered	? Valve in pancreatic duct
19	Boy, 4	Haigh	Laparotomy	Recovered	?

Except Ger's and Boss's cases there is little biochemical information on any of these.

Discussion

Aetiology. A mild pancreatitis occurs as a complication of mumps in about 2.5% of cases according to Harries and Mitman (1947) but is rarely severe and only one fatality is recorded (Lemoine and Laparset, 1905). Occasionally diabetes mellitus results.

In the summary of all the recorded cases of acute haemorrhagic pancreatitis it is seen that trauma is an occasional but definite cause, as the cases of Hagedorn (1913) and Dietrich (1914) both occurred as a result of being run over by a cart wheel and that of Dobrotvinsky (1913) followed a severe blow

Forshall and Rickham (1954) have shown that acute cholecystitis, which is also relatively uncommon in children, is frequently associated with a valve-like structure situated in the cystic duct. The valve-like structure just before the ampulla in the main pancreatic duct reported by Boss (1955) may therefore be of considerable significance, as more careful dissection or serial sections of some of the other post-mortem specimens might well have revealed similar lesions.

Acute pancreatitis has also been found at necropsy in severe burns in children collapsing suddenly and dying during the second and third week, but it is

part of a definite symptom complex and it is being recorded elsewhere.

Diagnosis. Most of the cases show a typical picture of the sudden onset of acute epigastric pain with profuse persistent vomiting, a silent distending abdomen and evidence of increasing intraperitoneal effusion, with guarding or rigidity and tenderness in the epigastrium. In two cases a cyanotic hue was noticed around the umbilicus but none record Grey Turner's sign of discoloration of the left loin.

A straight upright abdominal radiograph will help to exclude a perforated peptic ulcer by the absence of air under the diaphragm. Sugar is frequently found in the urine and the blood sugar level is usually raised above the upper limit of normal. Loewi's test is probably unreliable.

Markedly raised serum amylase and urinary diastase tests are the only certain confirmation of the diagnosis of acute pancreatitis.

Treatment. Of the cases reported the mortality rate is around 50% and all the survivors had a laparotomy performed. This may be the evidence on which Moncrieff and Evans (1953) state that without surgical intervention the outcome is always fatal, and Barrington-Ward (1937) advised drainage of the lesser sac. However, only three of the cases did not have a laparotomy and that was because they succumbed too precipitously. Three of the four cases occurring in the last decade all had laparotomy without definitive surgery and survived. This is probably a true estimate of the lower mortality rate likely with the improved standards of intravenous therapy and biochemical control to combat the severe surgical shock which develops so rapidly in this condition.

There is no justification for drainage of the biliary system in children and little theoretical good can

be imagined from drainage of the lesser sac. Consequently, in line with the present therapeutic trend in adults, it would seem wiser, if the diagnosis has been definitely established, to treat conservatively with antibiotics, intravenous infusion, gastric suction and antispasmodics.

Summary

Seventeen cases of acute haemorrhagic pancreatitis in children have been recorded previously in the literature and two more are described.

Trauma and roundworm infestation are the two main established causes. Coincident biliary disease is rare and in over half the cases the cause is unknown, but valves in the pancreatic duct may be a cause possibly overlooked.

Contrary to the older teaching, if the diagnosis is established conservative treatment is advocated.

I wish to thank Miss Isabella Forshall and Mr. P. P. Rickham for allowing me to treat and publish these cases.

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