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# Plasma amylase estimation in recurrent abdominal pain in children

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**In a prospective study of 50 children who were admitted on more than one occasion with undiagnosed abdominal pain, the serum amylase was found to be normal in every case. One case of acute pancreatitis was diagnosed in over 8000 admissions. Serum amylase estimation did not contribute to the management of children with recurrent abdominal pain, and acute pancreatitis is so rare that routine amylase estimations cannot be recommended in paediatric surgical practice.**

Recurrent abdominal pain in late childhood and early adolescence is a recognised but ill-understood entity. Pancreatitis in this age group is unusual, but it is possibly underdiagnosed *(1)*.

Acute pancreatitis secondary to gallstones or congenital duct anomalies is likely to recur if the cause is not diagnosed and treated *(2)*. We are not aware of any prospective study of the incidence of pancreatitis in children with recurrent abdominal pain.

## Method

All children admitted to this hospital in a 24-month period on a second or subsequent occasion with undiagnosed abdominal pain were entered into the study. Children re-admitted after surgical treatment of a defined condition were excluded. In each case blood was taken for amylase estimation by the Phadebas method, immediately after admission and again on the following day.

During the study period there were 8680 emergency admissions to the paediatric surgical and medical wards. Plasma amylase was measured when clinically indicated in children with non-recurrent abdominal pain.

## Results

A total of 50 children, with a mean age of 8 years (range 2–16 years) were admitted on 58 occasions with recurrent episodes of abdominal pain. Plasma amylase was measured in all cases within 2 h of admission (range 0–56 h; mean 31 h) after the onset of pain. The mean amylase value was 132 IU/l (range 43–224 IU/l). None of these children was thought to have acute or chronic pancreatitis. A final pathological diagnosis was made in 10 children (Table I). The remaining 40 children were diagnosed as normal, constipated or unresolved. The

*Table I.* Diagnostic outcome in 50 children with recurrent abdominal pain

| | |
|---|---|
| Urinary tract infection | 6 |
| Gallstones | 2 |
| Pelviureteric junction obstruction | 1 |
| Lymphoma | 1 |
| Constipation | 15 |
| No diagnosis reached | 25 |

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diagnosis of pancreatitis was not made in any child primarily referred to this unit.

One case of pancreatitis was seen during the study period. A 3-year-old was referred from another hospital with peritonitis and vomiting. At the time of his transfer to Southampton on the 3rd day of his illness the serum amylase was normal. Acute pancreatitis was diagnosed at laparotomy. Subsequent testing of the district hospital admission sample showed elevation of amylase to 1400 IU/l. His pancreatitis was ascribed to recent treatment with prednisolone, 40 mg/day, for idiopathic thrombocytopenic purpura.

## Discussion

This study has shown no benefit from routine amylase estimation in children with recurrent abdominal pain. Standfield and Howard *(1)* have suggested that recurrent acute pancreatitis may be underdiagnosed; they found 11 cases in 13 years in their practice and recommended that surgeons treating children with recurrent abdominal pain should consider this diagnosis. In contrast, in a 2-year period, in patients presenting with recurrent attacks of abdominal pain we found no cases of pancreatitis.

The usefulness of serum amylase estimation in the diagnosis of pancreatitis depends on the time of presentation. In adults, it is known that amylase levels peak in the first 24 h of the illness and subsequently decline rapidly *(3,4)*. There is no corresponding evidence in children, but it is reasonable to assume that a similar process occurs. Consequently, blood sampling must be done as early as possible in the course of the disease in order to avoid missing this transient peak of elevation. Retrospective testing of samples taken on admission is sometimes useful. It is unlikely that failure to detect raised amylase levels in our patients was due to delay in blood sampling, which was done within 2 h of admission in all cases, and a mean time of 31 h after onset of symptoms. Plasma lipase levels remain elevated longer than amylase levels in acute pancreatitis *(4)* but this test is not widely available. Abdominal ultrasonography or computed tomography will show pancreatic swelling and peripancreatic fluid collections *(5)* in acute pancreatitis. These imaging techniques are probably more appropriate investigations than biochemical tests in obscure cases when the diagnosis is suspected after late presentation. However, the need to exclude pancreatitis in children with abdominal pain arises very rarely, in our experience.

Acute pancreatitis is rarely diagnosed in children—we found only a single case in over 8000 emergency admissions. Some cases of mild pancreatitis may have been overlooked, and resolved spontaneously, in children presenting with a first attack of abdominal pain. Serum amylase estimations were not performed in all these cases. The clinical relevance of making such a diagnosis is doubtful.

Routine amylase estimation is not justified in children with either a first attack or recurrent episodes of abdominal pain. This test should be reserved for those cases in which the signs and symptoms of peritonitis are present without an obvious cause, when an elevated amylase level might avoid the need for laparotomy. Recurrent pancreatitis is extremely rare in childhood.

## References


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# Invited comment

This is a simple but useful clinical study showing the uselessness of routine serum amylase estimation as a test in recurrent abdominal pain in childhood. Unfortunately, the diagnosis of pancreatitis cannot be ruled out on this test alone. Some cases of subsequently proven pancreatitis do not show an elevated amylase even when tested within 24 h. It is a pity that the opportunity was not taken to study other serum enzymes such as lipase and immunoreactive trypsin and elastase at the same time. Also, if they had been really trying to