Summary

A case of galactokinase deficiency is described in a newborn infant of Pakistani parents. Bilateral cataracts developed by the age of 27 days and completely disappeared on treatment with a galactose-restricted diet. There was no evidence of disturbance of function in other tissues.

REFERENCES


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Trial of Amino Acid Supplements in Cystic Fibrosis of the Pancreas

In cystic fibrosis (CF) patients with malabsorption, bacterial degradation of unabsorbed dietary protein leads to abnormally high urinary excretion of aromatic acids, phenylacetylglutamine and p-hydroxyphenylacetic acid, derived from phenylalanine and tyrosine, respectively (Seakins, Ersser, and Gibbons, 1970). The complete replacement of dietary protein by an amino acid mixture in CF resulted in a fall in urinary phenolic acid excretion (Gibbons, Ersser, and Seakins, 1969) and an improvement in the faecal amino acid pattern (Seakins et al., 1970). It was thought that this biochemical change towards normality might give some clinical advantage due to improved absorption of amino acids, particularly as it had been suggested that p-hydroxyphenylacetic acid might play a part in the susceptibility of patients with CF towards staphylococcal bronchial infections (May, 1969).

This note reports a trial on three patients with CF who had severe symptoms of malabsorption with abdominal distension and discomfort, and who passed bulky and offensive motions.

Clinical and Laboratory data

The 3 children chosen were girls with a proven diagnosis of CF, aged at the beginning of the trial, 3 years 4 months (Case 1), 3 years 11 months (Case 2), and 7 years 7 months (Case 3). Tryptic activity in stools or duodenal juice was abnormally low in all 3 (Case 1, stool tryptic activity, 4 units, normal 10–30; Case 2, duodenal juice tryptic activity less than 1 unit; and Case 3, 7 units, normal 10–60 units). The children received a low fat diet and pancreatic supplements, and the eldest child (Case 3) had been previously given a trial of medium chain triglycerides without lasting improvement. None of the children was grossly undergrown, though the youngest (Case 1) had fallen from the 25th to the 10th centile for both weight and height over the previous 15 months, and the weight centile of Case 2 had also fallen (from 40th to 10th) over the previous 2 years. Respiratory symptoms had been mild, though all had grown coagulase-positive staphylococci in throat swabs at some stage of their disease. Immediately before the trial period, however, repeated throat swabs had grown only commensals, and chest x-rays had shown minor changes of the disease.

The Table summarizes the parameters that were monitored during the study. From the data provided by the mothers over a period of one month, the average daily intake of calories, protein, carbohydrate, and fat were calculated for each child.

The children were then admitted to hospital and kept

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Laboratory studies

Full blood count, bleeding studies, liver function tests, serum protein and electrophoretic strip, serum iron and iron-binding capacity, serum folate, serum calcium, blood urea, serum amino acids, 24-hour urine was collected for amino acids and phenolic acids and a 24-hour stool estimation was sent for amino acid measurement.
on a diet as similar as possible to their home diet while baseline observations and investigations were completed. The L-amino acid mixture which was used to replace most of the (first-class) dietary protein had a composition similar to casein, and was given as a 10% solution in amount equivalent to 2g/kg per day (approximately 400 ml/day), for one month as in-patients, and for a further 3 months at home. During the trial period each child's carbohydrate, fat, and total caloric intake was kept as near to the previous intake as possible. Calcium lactate (1g q.i.d.), ferrous sulphate (40mg b.d.), Kevotone liquid and tablet vitamin supplements, pancreatin, and oral lincomycin (250mg t.i.d.) were administered throughout the trial. After 4 months a normal diet was reintroduced and the children reassessed at 2 and 4 months.

Results

There was no reduction in abdominal girth or stool frequency, or in their bulk and offensiveness while on the diet.

Height and weight velocities for the dietary period were compared with previous years, and more especially for identical months to allow for seasonal variations. The height velocity for 2 of the children rose from the previous year's value (Case 1 from below the 3rd to above the 90th centile, and Case 3 from the 7th to the 75th centile), but for Case 2 the height and velocity fell. All the children improved on weight centile, but the actual weight gains represented were small: Case 2, 10th to 90th centile, 1.7 kg; Case 1, 75th to 97th centile, 1.4 kg; and Case 3, below 75th to above 75th centile, 0.7 kg.

One of the children (Case 1) had a respiratory illness during the trial and H. influenzae and parainfluenzae were cultured from the sputum; she made a good response to treatment.

The laboratory investigations are listed in the Table; the only findings of interest relate to the decreased urinary excretion of the aromatic acids, phenylacetic and p-hydroxyphenylacetic acids. Two patients (Cases 1 and 3) showed a wide scatter in baseline values; though in both the single baseline value obtained before the amino acid supplement was introduced was 3 to 5 times greater than the values obtained after treatment, in neither patient was the fall in excretion of p-hydroxyphenylacetic and phenylacetic acids statistically significant. In the third patient (Case 2) the fall in excretion of these two aromatic acids during the dietary period was significant: from 426 ± 97 (n = 6) to 268 ± 54 µg phenylacetic acid/mg creatinine (n = 6) t = 3.4, 0.01 > P > 0.005; and from 241 ± 52 (n = 6) to 65 ± 41 µg p-hydroxyphenylacetic acid/mg creatinine (n = 6) t = 2.80, 0.02 > P > 0.01.

Discussion

No clinical benefit ensued from the amino acid diet given over this short period, though improvement in weight and possibly height velocities is encouraging, but for meaningful results a minimum of a year's period on the diet compared with a year off the diet would probably be required. However, this was not possible, partly due to the expense of the mixture, and also from realization that other factors such as lung infection might arise and significantly alter the growth data obtained.

On instituting the diet, there was a reduction in the excretion of aromatic acids statistically significant in one patient only. It may be that in the other two patients the introduction of the amino acid mixture had brought about a long-term change in gut flora which continued after the diet was withdrawn and was reflected in the lower baseline values (compare Winitz et al., 1970).

The trial was also too short to see if the incidence of respiratory infection was lowered in this group of children. The one lung infection seen was due to haemophilus, not to the commonest early pathogen, Staph. aureus.

Summary

The majority of dietary protein was replaced by an L-amino acid mixture in three children with cystic fibrosis over a period of 4 months. A fall in urinary phenolic acids was produced due to improved absorption of the pure amino acids, but no clinical improvement followed except for a possible improvement in weight velocity.

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REFERENCES


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