Sweat tests and flucloxacillin

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SUMMARY Sweat tests were carried out on 14 patients with cystic fibrosis and 14 controls when on no antibiotics and when taking oral flucloxacillin. No significant differences in results were obtained for either group whether on or off antibiotics. Oral flucloxacillin does not affect sweat electrolytes and is not a contraindication to sweat testing.

The sweat test remains the definitive test for diagnosis of cystic fibrosis. It has been reported, however, that normal concentrations of sweat chloride have been obtained in the presence of abnormally high concentrations of sweat sodium in a patient with cystic fibrosis while taking oral clavuloxacin,1 thus causing considerable delay in making the diagnosis.

When reviewing the methodology and diagnostic accuracy of sweat tests in our hospital we have become aware that oral flucloxacillin has occasionally been used as a contraindication to sweat testing of patients where the diagnosis of cystic fibrosis has been raised, sometimes resulting in a long delay in diagnosis and, potentially, a poorer prognosis.2-4 As this is a clinical situation where antistaphylococcal antibiotics are often used, we felt it important to carry out a study to determine whether reliable sweat test results can be obtained in subjects taking oral flucloxacillin.

Subjects and methods

Sweat tests, using the quantitative method of Gibson and Cooke,5 were performed on 14 patients with cystic fibrosis (age range 2-17 years; mean 9-14 years) and 14 control subjects (age range 3 months to 19 years; mean 7-57 years). Control subjects comprised normal siblings of patients with cystic fibrosis, other hospital inpatients, some of whom had previously had normal sweat tests as part of their investigations, and healthy volunteers.

All sweat tests were performed and analysed in the same laboratory by trained laboratory staff. Each subject had two sweat tests; one while on no antibiotics and another after the subject had been taking oral flucloxacillin for at least 48 hours. All patients with cystic fibrosis (except one with adequate pancreatic function) were also taking pancreatic extracts and vitamin supplements. All control subjects were on no other medication.

In all tests the sweat rate was either greater than 1g/m²/minute or weight greater than 100 mg of sweat. Sodium concentration was measured by flame photometry and chloride concentration by a coulometric method.

Results

Results of sweat tests performed while subjects were not taking flucloxacillin show a clear demarcation between controls and patients with cystic fibrosis when both sodium and chloride are considered (figure). All control subjects had chloride concentrations less than 70 mmol/l. Two patients, however, had sodium concentrations higher than 60 mmol/l, but chloride concentrations were lower than sodium and were within the normal range. Both these subjects were in the older age group (age 14 and 16 years) and neither showed any symptoms or signs suggestive of the diagnosis of cystic fibrosis. All cystic fibrosis patients had concentrations in the

Figure Sweat test results in controls and patients with cystic fibrosis while on and off oral flucloxacillin. Controls: no flucloxacillin (○), on oral flucloxacillin (●); patients with cystic fibrosis: no flucloxacillin (△), on oral flucloxacillin (▲).
abnormal range, (sodium greater than 60 mmol/l, chloride greater than 70 mmol/l).
Results of sweat tests performed while subjects were taking oral flucloxacillin also showed a clear demarcation between the two groups (Figure). There was no significant difference between the two sets of results—that is, on and off flucloxacillin (Wilcoxon signed rank test: p>0.5) in either group.

Discussion

It has been suggested that substitution of the chloride ion by cloxacinil may occur and artefactually produce unusually low sweat chloride results causing difficulty in confirming the diagnosis of cystic fibrosis. Our study disproves this hypothesis and confirms that there is no contraindication to sweat testing while a subject is taking oral flucloxacinil.

The possibility that the artefactually low chloride results were due to analytical interference exists as our method differs from that (modified Schales and Schales) used by Griffiths. We would, however, reiterate that sweat tests should be performed by experienced laboratory staff with measurement of both sodium and chloride ions. Results must always be considered in the light of clinical findings as well as the age of the patient to avoid misdiagnosis of cystic fibrosis.

Further work is required to ensure that other commonly used antibiotics do not interfere with sweat test results.

Mineral content of rib bone in infant deaths

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SUMMARY The mineral content of rib bone in infants who died unexpectedly was similar to that among those who died after acute illnesses, and it was significantly associated with both crown to heel length and age. In those dying from chronic illnesses it was lower than in the other two groups.

Unexplained death in infancy is thought to be caused by more than one disease. The process that results in some cot deaths may be active for a considerable time beforehand: infants may not gain weight properly before death, and retardation of growth of the costochondral junction has been shown histologically in specimens taken at necropsy from such infants. We used single photon absorptiometry to measure the mineral content of the ribs near the costochondral junction to find out if histological changes in cartilage at necropsy are associated with reduced mineral content of the ribs in these infants.

Patients and methods

We studied 92 consecutive necropsies undertaken in children under the age of 2 at the Children’s Hospital, Sheffield between October 1985 and February 1987. Details recorded included age at death in days (corrected for prematurity), sex, crown to heel length, and weight. They were divided into three groups according to type of diagnosis; unexplained death (n = 62), death after a sudden acute illness in a previously well child (n = 18), and death after a chronic illness (n = 12).

In all cases specimens of the right fifth rib including the costochondral junction were taken and stored and transported in a buffered calcium forma-
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