

Fecal Elastase: Pancreatic Status Verification and Influence on Nutritional Status in Children with Cystic Fibrosis

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OBJECTIVES: To evaluate fecal elastase 1 (FE) levels in young children with cystic fibrosis and pancreatic insufficiency and to explore the relationship between FE and growth, nutrition, pulmonary status and fat absorption over a 24-month period.

METHODS: FE, indicating pancreatic lipase activity, was assessed in children (6.0 to 8.9 years of age) with cystic fibrosis and pancreatic insufficiency. FE >15 mug/g stool was defined as residual pancreatic activity, suggesting some pancreatic function, and FE ≤15 mug/g stool was defined as no pancreatic activity, suggesting pancreatic insufficiency. Seven-day weighed food records were collected and coefficient of fat absorption was calculated using dietary records and 72-hour stool collection. Height adjusted for mid-parental height, weight, body mass index, upper arm muscle area and upper arm fat area were measured and Z scores were calculated. Forced expiratory volume in 1 second was the measure of pulmonary function.

RESULTS: Ten children (12%) had residual pancreatic activity (range, 17 to 667 mug/g stool) and 75 had no pancreatic activity. Children with no pancreatic activity had significantly lower coefficients of fat absorption than did those with residual pancreatic activity (81% +/- 14% versus 94% +/- 3%; P = 0.009) and significantly lower adjusted height Z score (-0.8 +/- 1.0 versus -0.1 +/- 1.3; P = 0.03). Children with residual pancreatic activity had significantly greater improvement in weight for age Z scores, upper arm muscle area Z scores, and upper arm fat area Z scores than children with no pancreatic activity (P ≤ 0.01). Children with no pancreatic activity were significantly (P = 0.007) more likely to have the DeltaF508/DeltaF508 genotype than were those with residual pancreatic activity (61% versus 11%).

CONCLUSIONS: These data suggest that a substantial number (12% in this sample) of children with cystic fibrosis have a misclassified pancreatic status. Children with residual FE had greater fat absorption and improved growth and nutritional status over 24 months. FE assessment should be used to verify pancreatic status in patients with cystic fibrosis.