THE PRESENT DIAGNOSIS AND THERAPY OF CYSTIC FIBROSIS OF THE PANCREAS

DOROTHY H. ANDERSEN, M.B.

The groups were defined as follows: Group I, patients with congenital intestinal obstruction; Group II, the early group patients with onset of chronic cough before the 6th month; and Group III, the late group of patients with onset of chronic cough after 6 months of age.

The pathological changes are chiefly in the pancreas, lungs and, in Group I, in the intestine. The changes in the pancreas may be interpreted as the result of an abnormality in the secretion, which causes it to be precipitated as eosinophilic material in the lumina of acini and ducts in increasing amounts. Main ducts are often patent but are sometimes plugged with secretion or are atretic. There is a progressive change in age, with increase in the contents of the lumina, and gradual atrophy of acini and replacement by fibrous tissue and sometimes by fat. The islands of Langerhans are unaffected.

The lung changes also vary with the age of the patient. In infants dying of intestinal obstruction in the neonatal period the lungs and bronchi are normal. In the young infants dying with bronchopneumonia there is an acute purulent bronchitis with Staphylococcus aureus as the infecting organism. Bronchogenic abscesses, sometimes perforating to produce pyopneumothorax, may be present and a lobe, or a large portion of one, may become aletectatic because of plugging of a bronchus. In later cases there is diffuse tubular chronic bronchiectasis in the tertiary and smaller bronchi, with thick peribronchial infiltration. The larger bronchi and trachea may be filled with pus in the terminal phase. Cases which have not received dietary and vitamin-A therapy show the squamous metaplasia of the bronchial epithelium resulting from vitamin-A deficiency. In some of the older patients the staphylococcus is accompanied by other organisms, usually of the colon group.

In our own series of congenital intestinal obstruction with fibrocystic disease, now numbering about 14 cases, the infant has usually been
surgically explored on the third to sixth day. In the earlier cases of
the series the most common surgical diagnosis was volvulus. It is now
realized that the cause of the obstruction is the nature of the meconium
itself. In the distal portion of the ileum the meconium is hard and
grey, resembling dry putty, and cannot pass the ileocaecal valve. This
material occupies the distal 10-15 cm. of ileum. Proximal to it there
is a large loop of ileum distended with dark brown or green sticky
meconium and faeces. Because of its size and weight this loop often
forms a volvulus or becomes gangrenous because of poor circulation.
Farber has shown that the meconium from these infants can be softened
by application of pancreatic juice and suggests possibly that the
meconium is abnormal for want of pancreatic digestion.

Fatty liver was frequently found in the untreated cases of the
early series but has rarely been present in treated cases. Pericholangitis,
Laennec's cirrhosis and inspissated secretion in a few bile ducts have
occasionally been observed. The gall-bladder is small and contains
inspissated secretion but no bile in about one-third of the total number
of cases including those of Groups II and III.

Fibrocystic disease frequently occurs in more than one sibling of
a family. Twenty family trees have been obtained in an effort to
determine the hereditary pattern.

Calculations based on Hogben's formula give a mean incidence
of 25% of siblings with the disease in affected families. Although
this frequency suggests a recessive trait, the pattern of family incidence
is against this, since there are more than the expected number of families
in which the majority of siblings are affected. A geneticist who was
consulted on this point remarked that the pattern suggested either that
the concurrence of two factors was required for the expression of the
disease, or that the disease was carried as a dominant trait but could
be suppressed by a second factor. This irregularity of incidence has
practical application in giving advice to parents of two or more children
with the disease. The disease may occur in one or both of twins. Sex
distribution is about equal. I know of three instances of first
cousins having the disease out of about 300 cases of which I have
some knowledge. There is suggestive evidence of the occurrence of
cases in some of the previous generations. In several instances the
majority of siblings of a large family in a previous generation are said
to have died of bronchopneumonia in early infancy, and in one family
with two infants with meconium ileus there was a maternal aunt who
died of intestinal obstruction in the neonatal period. It seems probable
that in another decade or so there will be evidence as to the trans-
mission of the disease to offspring of known cases.

The clinical picture on hospital admission is quite variable. In
Group I the meconium ileus may be recognized at operation by a
surgeon who is familiar with it. However, the obstruction is often