FIBROSIS OF LUNG IN CHILDREN.

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So many of the chronic pulmonary diseases start in childhood that it is very important to recognize and treat the various catarrhal conditions which are common in the child. But before discussing these catarrhal infections I should like to say a few words about tuberculosis in children.

Tuberculosis of the lungs except as part of a general tuberculosis is rare in children. During the first five years of life the mortality from tuberculosis is high, but after that age it rapidly falls and in children between the ages of 7 and 16 there is a very low mortality indeed. After 16 the mortality rises until it reaches its maximum in middle age. There are three age groups as regards tuberculosis. The first consists of the first five years of life when general and surgical tuberculosis is common but pulmonary tuberculosis is rare. The second between the ages of 7 and 16 when all tuberculosis is rare. And the third, after 16, when surgical tuberculosis is rare but tuberculosis of the lung is common.

Tuberculosis of the glands around the root of the lung is frequently present in children, but the lung tissue does not subsequently become infected from the glands. Dr. Wingfield examined 160 hardened specimens of the thoracic contents of children and found naked-eye tuberculosis of the root of the glands in 17.5 per cent. of cases, but he did not find any spread of the disease into the lung ("Modern Methods in the Diagnosis and Treatment of Pulmonary Tuberculosis," p. 116, R. C. Wingfield).

In these cases of tubercular bronchial glands the disease normally becomes arrested

leaving behind some calcareous glands, but no active disease. In some cases the children are listless, and poisoned by the tuberculous toxin, but in many cases there is little, if any, impairment of the general health. Of course tuberculosis of the roots of the lungs does occur, but I do not think it is secondary to the so-called hilum or bronchial gland tuberculosis. When the lung is affected the spread is often rapid. I saw a child, aged 13, who was at school and apparently well, when she suddenly became ill with what was thought to be influenza. A fortnight later harsh breath sounds but no adventitious sounds were heard over the root of the left lung. A little sputum was obtained, but no tubercle bacilli were found. The temperature was 98.6° in the mornings, and 102° at night. X-ray showed an opacity at the root of the left lung. A second X-ray taken three weeks later showed considerable spread of the disease, bronchial breathing and bubbling râles were heard over the middle portion of the left lung, and the sputum was loaded with T.B. During the five weeks of illness the child's weight had fallen from 6 st. 11 lb. to 5 st. 3 lb. A left artificial pneumothorax was at once induced, and a year later the patient was free from symptoms and weighed 7 st. 7½ lb., but there was a large area of fibrosis. This case illustrates the extreme rapidity with which tuberculosis of the lung spreads in children. It should also be noted that tubercle bacilli were not found in the sputum in the early stages. Whereas absence of T.B. from the sputum in the later stages of disease is very strong evidence against the disease being tuberculosis, it must not be forgotten that it is by no means uncommon to fail to find them in the early stages.

In the adult, disease at the apex of the lung is almost invariably tuberculous, but not so in the child, where the great majority of such cases are non-tuberculous, and resolve like ordinary pneumonia after a time, although some fibrosis occasionally remains.

It is the catarrhal conditions which are

important, for they are so common in children, and are apt to lead to bronchiectasis, fibrosis, or chronic bronchitis. The principal causes of catarrh in children are measles, influenza and, to a less extent, whooping-cough. In 1925 there were 94,769 deaths in England and Wales in children under 15 years of age. Of these 20,637 were due to non-tuberculous respiratory disease, 1,539 to pulmonary tuberculosis, and 4,490 from other forms of tuberculosis.

In lobar pneumonia due to the pneumococcus there is much congestion and exudation which is completely absorbed when the patient recovers. There is no actual destruction of lung tissue, as there is in bronchopneumonia. The cases of so-called unresolved pneumonia are usually those where the pneumonia takes longer to resolve than usual. It is only when there is actual destruction of lung or bronchial tissue that healing takes place by scar tissue, and fibrosis results. It is therefore the bronchopneumonia type of disease following measles or influenza which is most likely to lead to fibrosis.

There is undoubtedly an enormous amount of catarrhal infection of the lungs in early life. Many children are known to be liable to colds or attacks of bronchitis; often it is a general bronchitis, but frequently each attack is localized in a certain area of the lung, and in each attack it is the same part of the lung that is affected. As time goes on fibrosis takes place, and often a bronchiectasis follows. Moreover, it is often found that several children in a family are affected and suffer from bronchitis, and the mother will say, "All my children have weak chests." This suggests an infection spreading through the different members of the family. Treatment, therefore, should be started early, and should be thorough, for by curing the first child and removing the infection the other children are protected. When once fibrosis or bronchiectasis is well established there will always remain damage in the lung. In the case

of a child who has frequent attacks of bronchitis before any definite fibrosis has developed, much more can be done. All sources of infection, such as the tonsils, teeth, gastro-intestinal tract, should be sought for and treated where necessary. A vaccine is more often successful in children than in adults, and if it is impossible to obtain an autogenous vaccine a stock one may be given, and often gives good results if used as a prophylactic. Parke Davis anticatarrhal vaccine has prevented the liability to colds and bronchitis in several of my patients. I usually start with a small dose such as 0.1 c.c. and increase every three or four days by 0.1 until 1 c.c. is reached, or until a reaction is produced, in which case the dose is not increased.

A long holiday will often cure a child, and I have seen very excellent results from a visit to Switzerland or to the seaside, where the child can have plenty of sun and outdoor games. It is a mistake to coddle the child too much. Light clothing, sunlight and fresh air are as good as a hot room and heavy clothes are bad. Of course, during the acute attacks the child should be kept in bed, but afterwards the real treatment, aiming at the prevention of recurrence with possibly a subsequent fibrosis and infection of other children, should begin, and should consist of getting rid of all foci of infection, and training the child into the best possible condition by healthy outdoor games, good food, and as much sunlight as possible.

SURGICAL RESURRECTIONS—IV.

GAS GANGRENE OF THE LOWER LIMB.

ONE morning in August, about six years ago, a girl of 17 was injured in a motor accident, and brought straight to hospital. When admitted she was suffering severely from primary shock. The left knee was found to be dislocated, the left tibia fractured,