understand them, at least, and at any rate to do what can be done for them. But psychotherapy to be successful requires co-operative response by the patient. The psychotics cannot, and the obsessed often will not, co-operate with the physician. Even magic requires for its successful application the belief that in itself implies co-operation.

I repeat, the scope for psychotherapy, in the hands of the general practitioner, is, first and foremost, in dealing with the numerous patients who, not the subject of gross somatic physical change, are yet, with the best intentions and the worst consequences, so often submitted to operations and to useless forms of physical treatment before the true origin and nature of the malady is recognized. Alas! that it should be so. And, again, alas! that the true nature of the case is so seldom recognized before the flush of "functional" vasomotor disturbance has given place to small-celled infiltration and fibrosis or other structural consequences of nutritional change.

Your business and your interest are with the "little foxes that spoil the vines." The little foxes are the emotional disturbances which, finding surreptitious expression in "functional disorders" of viscera, are the true begetters of the dreaded "organic" disease.

CHRONIC NON-TUBERCULOUS INFECTION OF THE LUNGS IN CHILDREN *

BY

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I have chosen this subject for my lecture for two reasons. Firstly, the subject is not dealt with clearly or comprehensively in any of the ordinary textbooks, and secondly, experience at the Brompton Hospital shows that many practitioners have no very definite ideas about it. The cases grouped under this heading receive a large variety of labels—chronic bronchitis, recurrent bronchitis, unresolved pneumonia, recurrent or interstitial pneumonia, and fibrosis of the lung with or without bronchiectasis are the diagnoses which are made. It may be considered that to include all these under one heading is unjustified, but if they are seen in large numbers it will be realized that they have a very strong family likeness. I admit that the physical signs in the chest vary considerably, but observation of individual cases over a period of years shows that those who start with slight physical signs in the lungs may steadily deteriorate and finally show signs associated with advanced destruction of the lung substance. Hence I believe that the cases in which these diagnoses are made are really different stages or minor variations of one condition—rather than several diseases. A great deal of the lack of knowledge about them is due to the fact that they occur mostly in children of the poorer classes, with the result that the same practitioner does not have the chance of following many of them through all their varying stages, as they only attend a doctor during acute exacerbations. The child is considered "chesty" by its parents, but as the degree of illness is not sufficient ordinarily to keep it in bed, and the treatment involved is expensive and tedious, there is a tendency for the parents to pay little attention to the symptoms, and the child is seen by the doctor only on the occasion of the next exacerbation. Again, necropsies are not often obtained, as the children seldom die in hospital:

* Report of a lecture delivered at the Charing Cross Hospital Sunday Post-Graduate Course.

when they are admitted during an acute flare-up, careful nursing usually brings them to convalescence. Even when necropsies are obtained, the disease is in the advanced stages and the destruction has gone so far that any clear understanding of the aetiological process is quite impossible. The experience of those who work in the out-patient departments of children's and chest hospitals is, however, very different. These children come up in large numbers and attend for many years.

The cases present a very definite clinical syndrome, but the history usually takes a good deal of elucidation because the facts in the earlier history of the case have been half forgotten and are only volunteered after close cross-examination.

A TYPICAL CASE HISTORY

The following represents a typical history. The child was perfectly well until the age of about 2 years, when it suffered from an attack of whooping-cough; this was associated with respiratory complications—bronchitis, and probably an attack of broncho-pneumonia. From this date the child has never been the same. At first it had a cough in the winter which cleared up in the spring, and during the summer months no ill effects were noticed. Every now and then the child caught a fresh cold which immediately went to his chest, and an attack of bronchitis ensued. The child more than once became rather acutely ill, and the doctor who was called in found on examination of the lungs what he thought was going to be a patch of broncho-pneumonia at the base of the left lung. When he came on the following day the child was better, and to the doctor's surprise the signs had become markedly less. Recovery took place, but the cough was not lost until the return of the warmer weather. These "colds on the chest" tended to become more frequent, and on each occasion the doctor found signs in the same place. After two or three years the colds, which had been absent in the summer, began to appear at this time also; finally the child was never free from a cough. Apart from the cough, the child was comparatively well between the colds. It was fairly well nourished; there was, however, disinclination to take any violent exercise, and the patient got short of breath. The slightest exposure or diminution of resistance was inevitably followed by the dreaded cold on the chest. At length the chronicity of the disease began to arouse suspicions of tuberculosis in the doctor's mind, and the child was sent to hospital for an opinion.

When considered on a large scale, the points of resemblance in the histories are so marked that the identity of the condition is impressed upon one very forcibly. The differences are matters of degree and of the stage of the disease at which the child is seen. The difference in physical signs depends upon this and upon whether a partial collapse of the lung has occurred. I feel that until the pathology and bacteriology are clearly proved these cases should, for clinical purposes, be grouped together.

AETIOLOGY

1. The commonest causes are *whooping-cough* and *measles*. If care is not taken that the chest completely clears, the syndrome is apt to occur; presumably, in the bronchitis which accompanies whooping-cough or measles damage is done to the walls of the smaller bronchioles, and a chronic infective process is set up. The children of the well-to-do who have had these illnesses severely are usually carefully treated afterwards by extra rest, fresh air, and sun, in the country or at the seaside, till the lungs have completely recovered and normal health has been restored. If this is done ill effects do not usually follow, but in the children of the poor careful after-

treatment is not available—this is the main reason why the syndrome is common among the poor and relatively uncommon among the children of the wealthier classes.

2. Attacks of *acute bronchitis*, of which the origin is not clear, are another relatively common cause: this is especially so when the condition affects the smaller bronchioles, and if patches of broncho-pneumonia appear. The expression that a child has "cut its teeth with bronchitis" is one at which we are inclined to smile, but there is no doubt that attacks of bronchitis do frequently occur during teething, and this is sometimes the origin of the whole process. Whether one should consider the presence of adenoids obstructing the upper air passages as predisposing to acute bronchitis and therefore to be dealt with in the preceding paragraph I am not quite certain, but upper-air-passage obstruction and the catarrhal condition which this causes are certainly predisposing factors.

3. The place of *rickets* in the aetiology is rather doubtful. Among the more usual symptoms of the disease bronchitis has a prominent place, and it seems reasonable to think that the influence of rickets in this condition can be included. A history of rickets occurs fairly commonly in these cases, but the accuracy of the history of its absence must depend upon whether or not the child was seen at the time by one who was interested in this complaint and on the look out for its minor manifestations.

4. *Influenza* is not so frequent a cause as is commonly thought. Although the attack of so-called influenza often appears to be the origin of the process it is frequently really nothing except a feverish attack with respiratory symptoms, and if careful questions are asked as to whether there was an epidemic of influenza at the time, and, if cases occurring only during this are allowed, the influence of influenza is much reduced.

5. *Lobar pneumonia* and empyemata which have been drained are usually given as common causes. I believe that this is a mistake. Lobar pneumonia is a rare disease in children at the age at which this syndrome starts. It is a condition characterized by a profound exudate into the alveoli of the lung, which usually clears up within a very short time, leaving the lung in a state in which it is impossible to find any deviation from the normal.

The *broncho-pneumonia* of children is a different process. The epithelium of the smaller bronchi becomes inflamed and in many cases probably ulcerated; this allows organisms access to the deeper layers, and is therefore much more likely to leave a residual infection. The symptoms caused by a partially collapsed lung following an empyema which has been drained are not very marked; in fact, the heart may be pulled well over to one side with definite evidence of thickening of the pleura without any symptoms except dyspnoea. Similarly patients who have had an artificial pneumothorax for pulmonary tuberculosis may, at the end of their treatment, show extensive signs with no symptoms. Damage to the smaller bronchi appears to be the deciding factor.

6. *Foreign bodies* in the lung, if of an inorganic nature, may give rise to symptoms resembling the syndrome we are discussing; but those of an organic nature give rise to more acute symptoms.

OTHER AETIOLOGICAL FACTORS

The family history is extremely interesting. Leys, who has made a study of this condition, states that 23 per cent. of patients give a history that either the father or the mother had a chronic cough or chronic bronchitis, and

in 26 per cent. there were other children in the family suffering from a similar condition. He suggests "chronic pulmonary catarrh" as a name.

The amount of work which has been done on the question of the infecting agent is comparatively small. Leys considered that Pfeiffer's bacillus is probably the organism responsible; this observation is supported by Opie, who found Pfeiffer's bacillus in 86 per cent. of cases of broncho-pneumonia following measles.

The condition can commence at any age from birth upwards, but most commonly commences between 2 and 6 years of age. On the whole, boys seem to be more frequently affected.

SIGNS AND SYMPTOMS

The symptoms are fairly constant. Cough is always a prominent feature; it often assumes a paroxysmal character, especially first thing in the morning. In the early stages the cough is lost during the summer months, but later it is present all the year round. Sputum is usually present, except in the mildest cases. It will be remembered that ordinarily small children swallow their sputum, and in consequence the number of cases in which sputum occurs will be very much greater than those in which it actually appears. This is one of the conditions in which sputum does occur in small children. It is frequently purulent, but does not get offensive until the later stages. Haemoptysis in the form of streaks is a common complication; occasionally it occurs in larger quantities. Dyspnoea is a fairly constant feature. The general health between the exacerbations is good, but is interrupted by the recurrent attacks of bronchitis and colds on the chest. Weight is variable: as a rule the children seem very well nourished, in other cases they may be thin. Pain in the chest of an aching character is often complained of, usually referred to the side on which the signs are found. The outstanding feature of the symptoms is, however, their recurrent nature; the child has periods of comparatively good health, but the tendency is for these to be shorter and less complete. The temperature is frequently irregular. During the acute stage it may rise to 103° with an accompanying frequency of pulse and respiration; during the periods of remission it may be slightly irregular in the evenings. The child's colour is usually good. The tongue is commonly rather furred, probably the result of the material which is swallowed. Early clubbing of the fingers is often found, and, before actual clubbing, glazing and slight cyanosis around the nail beds are noticed. The physical abnormalities in the chest during the period of remission may be surprisingly few. Commonly, there is a slight impairment of note, a diminution of breath sounds, and one or two rales in the area near the angle of the scapula on the left side. They occur about twice as frequently on the left as on the right. If the case is seen during a flare-up there will be signs suggesting a deep-seated consolidation in the same area, and bronchitis throughout both lungs. In the later stages the heart is found to be displaced towards the affected side, and marked evidence of pleural thickening and fibrosis is found. When this stage is reached the rest of the lungs usually show scattered rhonchi.

RADIOGRAPHIC CHANGES

The x-ray appearances do not help much in the earlier stages. Those usually found are: (1) Increase of striation running down from the lower part of the hilum towards the base, which may on the left side be partially hidden by the heart shadow. The hilum shadows are usually increased. (2) The diaphragm may show some diminution of movement and evidence of peaking. (3) The heart, if the film is accurately centred, is often slightly displaced

towards the affected side. If the condition is advanced, the heart is considerably displaced towards the affected side, and the lung markings are completely masked by a dense shadow suggesting thickening of the pleura. Occasionally, cavities with fluid levels may be seen in the course of the bronchi. X-ray photographs after injection of lipiodol show bronchial dilatation in moderate and advanced cases.

DIFFERENTIAL DIAGNOSIS

This is usually easy. Pulmonary tuberculosis is the condition which one is usually asked to exclude. There has been a great deal of work and discussion of recent years in America on pulmonary tuberculosis in children, and an impression has got about that it is relatively common. Recent work at the Brompton Hospital does not confirm this. In children under 7 years, the Mantoux intracutaneous tuberculin reaction is not positive in more than 30 per cent. unless there is a strong contact history, and this refers to cases coming up to the hospital with some chest complaint. The investigation of the x-ray shadows in conjunction with the Mantoux reaction does not lend any support to the idea that tuberculosis of the lungs is frequent in young children in England. Out of five hundred cases only three were definitely proved to have active tuberculosis, and in these the lesions were in the upper parts of the lungs. The age during which chronic non-tuberculous disease of the lungs is common appears to be the age at which chronic pulmonary tuberculosis is uncommon. The history of the child being "chesty" over a number of years is very strongly against a diagnosis of pulmonary tuberculosis.

The other common differential diagnosis is between this syndrome and chronic heart disease. Children with mitral disease often have symptoms strongly resembling the condition under discussion, but careful examination of the heart and consideration of the history will prevent error in this respect.

Foreign bodies in the lung will occasionally give rise to difficulty, but if the possibility of their occurrence is remembered the main difficulty will disappear.

COMPLICATIONS AND PROGNOSIS

These are not very frequent apart from the ordinary progress of the disease itself. Severe haemorrhage is rare, but does occur. Secondary infection with tubercle bacilli is by no means unknown. I have a patient under my care at Brompton who originally started this complaint at the age of 3½ years, and has subsequently attended the Brompton Hospital for fifty-two years. About three years ago, having had in all over thirty negative sputums, she suddenly had a positive, and I am pretty certain that this represents a superadded infection. There is no x-ray change in the better lung, and it is impossible owing to the density of the shadows in the worse lung to see what is happening. She does not seem any the worse for this development.

The prognosis is illustrated by the previous case. Frequently the patient lives to late middle-age, but suffers from a chronic cough and sputum with acute exacerbations throughout life. In other cases death occurs during childhood in one of the periodical "flare-ups," but if adolescence is reached the prognosis as regards early death is not very bad.

TREATMENT: PROPHYLACTIC AND CURATIVE

The prophylactic treatment will be realized from consideration of the aetiology. Following measles and whooping-cough the child must be carefully looked after until complete health is restored. This will usually occur if proper

convalescence is insisted upon. Sea air with plenty of sunshine will be sufficient, but the period of convalescence must be carried on until all symptoms have disappeared. A similar convalescence should be arranged after attacks of broncho-pneumonia or bronchitis.

The treatment when the condition has developed is not so satisfactory. In cases where the parents have enough money and are prepared to take sufficient trouble, a great deal can be done. The child should be sent to the seaside (especially during the winter months), at first convalescent and then for school. A short period is not of great value. The child will improve, but will relapse on the return to old surroundings. Should the seaside be impossible country air may be tried, but a dry subsoil is essential. The child should be removed, if possible, from other members of the family with chronic coughs; it is probable that reinfection does take place when once the ground has been prepared. In cases where this is impossible, an open-air school will probably produce marked benefit. Extra rest should be insisted upon; the child should have long nights, and should lie down for a couple of hours in the afternoon, preferably in the open air. Any definite sepsis or obstruction in the upper air passages must be dealt with. Breathing exercises are of great value; they expand the bases of the lung and tend to permit efficient drainage. In the absence of real sunlight artificial sunlight is usually the main method of attack for increasing the general resistance. The diet should be liberal and contain considerable quantities of vitamins. Cod-liver oil and malt should always be given and plenty of fresh fruit and vegetables. I have found the use of glucose to be very valuable. I have been trying these children on vaccines for some time, and in certain cases there has been a benefit; on the whole, however, the results have been disappointing. When the disease has reached a more advanced stage and sputum is a prominent feature, postural drainage is beneficial. Drainage by means of a bronchoscope is only palliative, and it is impracticable to get this done often enough to be of any great use. Collapsing the lung by means of an artificial pneumothorax would be valuable if practicable, but in nearly every case adhesions prevent an adequate collapse. Evulsion of the phrenic nerve seems to be the most reasonable form of treatment in more advanced cases. Lobectomy of the affected lobe is such a severe operation that it is hardly within practical politics at present. Thoracoplasty in children is not satisfactory; the deformity of the chest is very severe, and the results do not seem to justify the risk. Expectorants and inhalants are very disappointing; they may be of some symptomatic value in relieving the cough, and making the sputum, if it has become offensive, less so. The use of the creosote chamber is probably the most efficient method, as by this means any stagnant secretions are generally brought up. The severity of the cough, however, in a chamber of this kind frightens the child so badly that it is hardly practicable.

RESULTS OF TREATMENT

The results of treatment in the fully developed cases are not very good, but in the earlier stages, if the means of the patient permit, a great deal can be done. I have under my care three children, all of whom are relatives of doctors and in whom treatment has been successful; but one must confess that the results in hospital cases are very poor unless by some fluke a new home by the seaside or in the country can be arranged. It is clear that our efforts should be concentrated on prophylaxis, recognizing the condition in the earliest stages and realizing what is likely to happen if drastic steps are not taken. If this is done a large amount of chronic illness will be avoided.