

Diagnosis of Early Pulmonary Tuberculosis

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THE diagnosis of Pulmonary Tuberculosis—particularly in early stages, is made difficult by the varied modes of onset. Most frequently, if not always, it hinges on the close correlation of an adequate and searching history, a thorough examination, perfect X-ray interpretation, and skilled laboratory investigation. It is the purpose of this article to deal in sequence with each of these factors, and thus provide a summary which may be of practical interest to the student.

There are two chief modes of onset—sudden and protracted—each with certain common features.

Sudden: A patient may, without any premonitory symptoms or exciting cause, get a warm, tickling sensation in his throat, cough and bring up some blood—haemoptysis. Physical examination or X-ray reveals a small but progressive lesion at one apex.

Another common onset in this class is the pleurisy type, where the patient develops an attack of pleurisy. Particularly should one be on guard when it is pleurisy with effusion.

Protracted: One most frequently gets the history of a patient not feeling well and having been subject to attacks of colds, grippe, or bronchitis from which he recovers and works more or less efficiently. Finally one attack persists, he consults his medical adviser—and tuberculosis is discovered.

A young man with early symptoms may be labelled as a neurasthenic especially if he complains of languor, or a tired feeling before the day is over, indefinite chest pains, morning cough, or being run down and in need of a rest.

In young women irregular menses or amenorrhea and a low haemoglobin are symptoms which may and frequently are attributed to anaemia, but if a cough develops and persists despite palliative treatment, tuberculosis should be suspected. In still other patients symptoms of dyspepsia are present—and they are treated for stomach trouble.

The most important symptom in this large group of cases is simply an undue fatigue lasting for many months before other symptoms appear.

Aids to diagnosis are a history of exposure to tuberculosis, any debilitating condition, or employment in trades involving inhalation of silica or dust.

Symptoms: The usual symptoms and signs are as follows:

1. Fever—a persistent slight afternoon or evening fever (between 99 and 100° F.) may be the earliest and only symptom. In a suspicious case the temperature should be recorded every two hours for a few days, the thermometer being held in the mouth for five minutes.

2. Cough—dry or productive—is the most frequent early symptom. It may be remittent and be mistaken for a symptom of the common cold. Sometimes the cough may be so slight as to be overlooked by the patient. *In any case where a cough has been present for four weeks or more, tuberculosis should be suspected and an investigation carried out.*

3. Expectoration—There is very little if any expectoration in an early case. At most just some viscid mucus which may or may not contain tubercle bacilli, although culture or animal inoculation may be effective in disclosing the nature of the disease.

4. Languor—is a constant symptom at a very early stage—probably the earliest symptom of all. The patient usually complains of feeling tired on arising. The feeling passes off after working a few hours, but in the latter part of the afternoon he feels fatigued, drowsy, and inclined to sleep. It is the tired feeling that makes us sometimes label the patient as a neurasthenic,

5. Loss of weight—this may be persistent and may be a pound a week. It is usually associated with loss of appetite and strength. These are constitutional symptoms and are due to the toxæmia of the active lesion.

6. Night sweats—So-called “night sweats” which may occur at any time during sleep, are usually of short duration in the early stages of tuberculosis, but are more commonly found in advanced cases. They may be slight and affect only the head, chest or legs or so general and severe as to soak the night clothes.

7. Tachycardia—An increased pulse rate is usually associated with an active lesion and is an early sign, being associated with elevation of temperature.

8. Haemoptysis—is rarely a primary symptom, and a frank haemorrhage is not as common as “streaking”, where the blood is mixed with mucus or pus. It is well to remember that the spitting of a dram or more of blood is to be considered as due to tuberculosis until proved otherwise.

9. Blood pressure—is usually low in tuberculosis.

Physical Examination:

Inspection and palpation are of little or no value in detecting a case of early tuberculosis. Percussion is difficult, confusing and at times misleading. Impairment may be remarkably slight. However, in most cases careful percussion will reveal an impaired resonance over one apex and on the posterior surface more frequently than the anterior. Auscultation in early cases yields evidence of greatest importance. One of the first signs that may be detected is prolongation of the expiratory murmur of respiration. A granular quality to the breath sounds is suggestive of fine râles which cannot be heard. These signs, if obtained, are of value only if limited and constant in a small localized area. The most important data obtained on physical examination are the more easily detected moderately coarse râles which in early stages are frequently confined to an area above the third rib and third thoracic vertebral spine. Early they may be very

few and scattered and are best elicited by deep inspiration after expiratory cough. Of course râles are not pathognomonic of pulmonary tuberculosis. They can develop in any intra-pulmonary disease. It is best to assume that persistent moderately coarse râles above the third rib and third thoracic vertebral spine are tuberculous in origin until proven otherwise, and that those in the lower half of the chest are non-tuberculous until their cause is determined.

It is often necessary for examinations to be repeated, since temporary signs are not very significant. It must not be forgotten, however, that physical signs indicative of typical pulmonary tuberculosis may be found in a vigorous individual who has never been aware of the disease.

X-ray is very important and is frequently of more value than physical examination. It alone may establish the diagnosis in some cases. However, it is quite possible to get a negative X-ray where physical examination reveals a moderately advanced tuberculous lesion. Although the X-ray is essential it should never take the place of a history and physical examination. The film should always be stereoscopic, especially for early or doubtful cases. It is not infrequently noted when studying stereoscopic films of a very slight but definite infiltration that one film will show no lesion, whereas in the other film the lesion can be made out. It is for this reason that a single flat film should be condemned in early cases due to the ease with which a lesion may be missed. The flat or single film may, however, be employed in cases of far advanced pathology. In early cases the X-ray picture reveals a fine or moderately coarse mottling above the third rib. This picture is seen in very few other diseases.

The fluoroscopic examination reveals the movement of both lungs—the presence of adhesions, mobility of the diaphragm and small amounts of fluid that may be present in the costophrenic sinuses, and with the present types of fluoroscopic screens very early infiltrations can be detected—hitherto almost an impossibility.

Laboratory Examination of Sputum: Tubercle bacilli may be found months before physical signs appear, and even before the X-ray demonstrates changes. However, failure to find the organism does not exclude the possibility of the disease and postponement of diagnosis and treatment until they do appear may delay or preclude recovery. In cases where there is no sputum a specimen of mucus from the throat should be examined. The patient should be instructed to bring the early morning sputum and none should be considered negative until three daily specimens have been submitted to concentration methods of examination. Sometimes it is necessary to examine a specimen of sputum every day for a week or more, before one can definitely rule out pulmonary tuberculosis. In cases where no tubercle bacilli have been discovered microscopically, it is wise to have the sputum cultivated. Guinea pig inoculation has at times proved the presence of tuberculous infection in the face of a negative sputum. If injection of a single specimen into a guinea pig does not cause infection that specimen probably contained no living tubercle bacilli. In such cases it is sometimes wise to skin test the animal with tuberculin. At the end

of thirteen weeks the animal should be killed and autopsy performed, or the animal may be skin tested with tuberculin.

In children the examination of stomach washings and even the faeces for tubercle bacilli is often rewarded with positive findings where there is no sputum or a negative one.

The Tuberculin Reaction: Tuberculin has been used diagnostically in many ways. At present the intradermal method of injection is mostly employed. A positive tuberculin reaction is an index of tuberculous infection; however, it does not distinguish between active and inactive disease. A positive test is likely to indicate activity in the first two or three years of life, but by puberty 40 to 75% of all children react positively. The test has its fallacies, however, since following the measles and influenza it may be absent or delayed. All non-reactors to the various strengths should be retested in three months to allow for an unduly long incubation period.

Many hold that changes in the blood picture are the most accurate indication of clinical activity, but no opinion should be ventured until three counts at weekly intervals and the sedimentation rate of the R. B. C. is checked. An increase of the absolute number of polymorph cells suggests softening of a focus. An increase in the absolute number of lymphocytes suggests increased resistance. The monocyte lymphocyte ratio, normally 1 to 3.4, is lowered with increased activity, but rises with decreased activity.

The Relative Value of Diagnostic Data: At the Trudeau Sanatorium five criteria have been selected as of essential importance in determining the presence or absence of tuberculosis. They are:

1. The history of or the presence of pleurisy with effusion.
2. The history of haemoptysis (loss of one dram or more of blood).
3. The presence of moderately coarse rales above the third rib and third thoracic spine.
4. A parenchymatous change demonstrable by X-ray in this same area.
5. Most important of all, the presence of tubercle bacilli in sputum

One or more of these criteria is necessary for a diagnosis of tuberculosis, and all must be absent to exclude such a diagnosis.

None of these factors is sufficient for a diagnosis of activity. While the localized symptoms and signs are of more value in determining the presence of a tuberculous lesion, general symptoms are the important index of activity. Symptoms such as fever, night sweats, rapid pulse, and loss of weight and strength are important in determining the activity of pulmonary tuberculosis. Other symptoms such as cough, expectoration, or even at times haemoptysis, are less significant. Physical signs are usually of value only when the patient is observed at frequent intervals. X-ray studies should also be frequent.