Etiopathogenesis of Suppurative Diseases of the Lungs*

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My task is to clarify some fundamental problems of etiology and pathogenesis of suppurative diseases of the lungs on the basis of works of Soviet scientists and my own observations during the last 10 years.

First: the question of terminology. Is it expedient and possible to strictly distinguish between abscess and pulmonary gangrene on the basis of clinical manifestation? Judging from a large number of clinical patients observed, one must come to the conclusion that the clinical distinction of abscess and pulmonary gangrene is possible only in the minority of cases, in those cases which are so to say on the contrary poles, i.e. where the symptoms of gangrene or abscess are shown more clearly. In the majority of cases it is difficult and almost impossible to clearly differentiate between gangrene and abscess on the basis of a clinical picture. Besides this the clinical course of the disease often changes acquiring features which are peculiar now more to abscess, now more to pulmonary gangrene; there is no doubt that in the course of the disease abscess may change into gangrene and gangrene into an abscess. As it is shown by the pathologic data simultaneous existence in the lungs of the changes peculiar to abscess as well as to gangrene is possible. That is why the majority of Soviet clinicians in accord with the late academician S. I. Spasokukotsky, the most prominent pulmonary surgeon, widely use the term suppurative diseases of the lungs.

The microflora of the sputum does not show the character of pulmonary disease—that is whether it is gangrene or abscess. We shall come to that question later.

A correct choice of treatment of any disease presupposes as its premise a correct notion of its etiology and pathogenesis. We shall not dwell on those etiopathogenic cases the significance of which in the origin of pulmonary suppurations doesn't call forth doubts. Therefore we shall put aside the pulmonary suppurations of embolic, aspirative and traumatic origins, suppurations connected with the presence of bronchogenic cancer of the lungs, etc. We shall only say that according to the statistics of various authors.

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particularly American, the specific incidence of pulmonary suppurations of aspirative origin occurring after operations especially in the oral cavity and the pharynx, particularly after tonsillectomy, is very great among suppurative diseases of the lungs. Whereas in the statistics of Soviet authors the suppurative diseases of the lungs of such origin play an insignificant role.

The question of the relation between pneumonias and pulmonary suppurations is of special interest and great practical importance. The notion of many authors that most suppurative pulmonary processes are connected with pneumonias should be recognized as without sufficient basis. It cannot be denied that in a number of cases suppuration may be looked upon as a complication of pneumonia, mainly focal and not pneumococcal lobar pneumonia. However one often sees patients who already, after the first two to four days of illness, expectorate large quantities of purulent fetid sputum. There isn’t enough basis to attribute such cases to postpneumonic suppurations of the lungs as is often the case. Evidently there are cases where the process in the lungs for various reasons (a change of the reactivity of the organism, serious disturbances of blood circulation in the lungs) develops from the very beginning as suppurative. The notion of a frequent pathogenetic connection between pulmonary suppurations and pneumonias is explained by the fact that initial symptoms of pulmonary suppuration often resemble to a great extent the clinical picture of pneumonia. Due to it later on when there are already indisputable signs of formation of abscess for instance in the form of expectoration of more or less large quantity of purulent sputum the suppuration is presumably connected with an earlier case of pneumonia.

The question of the connection between a suppurative pulmonary process and pneumonia is often difficult to decide not only for a clinician but for a pathologist. The most prominent Soviet pathologists (Abricosov, Davidovsky) point out that sometimes one has to judge the connection between gangrene and pneumonic focus only from the patient’s anamnesis as the pneumonic focus in the development of gangrene in some cases completely disappears. The conclusion of pathologists on the postpneumonic origin of gangrene on the basis of clinical and not directly anatomical data is a source of errors causing a wrong notion of a particular connection of suppurative diseases of the lungs with pneumonias.

An important role in the question of the etiopathogenesis of pulmonary suppurations is played by the character of microflora found in the sputum and in the lungs during this illness. Judging from numerous observations of Soviet and other authors and bacteriological research made on our patients, the microflora
during pulmonary suppurations (with the exception of metastatic abscesses) is usually polymorph and has much in common with microflora of the oral cavity; pyogenic cocci are particularly often met with here. Polymorphism of the flora indicates that we cannot speak of any definite specific agent of suppurative diseases of the lung. This fact becomes intelligible if it is approached from the neurogenic point of view which dominates in Soviet medicine, ideas which originated with S. P. Botkin, the eminent Russian clinician of the second half of the 19th century and which have found their physiological and experimental basis in the works of genius of the greatest Russian physiologist, I. P. Pavlov, and in the researches of his disciples.

It's a well known fact that the infection of a person even by a specific agent is not enough to call forth in him any definite illness. Whether the disease is called forth or not depends on the reactivity of the human organism which in its turn is determined in the main by the state of the nervous system. This condition is the more so correct in suppurative diseases of the lungs for which there exist no specific agent and where the deciding factor for the calling forth of the illness and its course is the state of a person's reactivity, i.e. in the final analysis the state of his nervous system. That is why we, contrary to many foreign authors, do not attach deciding significance as mentioned above to the microflora of the sputum in distinguishing the gangrene from the abscess. The penetration into an affected lung of a fusospirochetal infection, agents of gas gangrene and other anaerobic organisms is secondary and not the cause for the outbreak of the disease though it may exercise some influence on its further development.

The aforementioned notion of the role of infection, the reactivity of a person's organism and the state of the nervous system for the outbreak of suppurative diseases of the lungs finds its confirmation in the observations during the war period on people and in experiments on animals. True, this concerns not suppurative diseases of the lungs but pneumonias, however, principally, the question remains unchanged. Soviet clinicians have observed that pneumonias occur particularly often in those with wounds in the skull and face. The sole explanation of the occurrence of such pneumonias was in many cases the recognition of their reflex origin. So-called vagal pneumonias occurring when the animals experimented on had the vagus cut in the neck have been known for a long time. Academician A. D. Speransky with his collaborators obtained pneumonia in animals by different manipulations on the central nervous system (suboccipital injections of various substances into the subarachnoidal area, etc.). The work of A. B. Tonkich, Soviet physiologist who was able to call forth pneu-
monias in experimental animals on by irritation of the upper cervical sympathetic ganglions, is of great interest. All these observations and experiments as well as many others which I have no possibility of mentioning and the observations of Soviet pathologists (Abricosov, Mogilnitsky) on the changes of sympathetic ganglions during pneumonias confirm the correctness of the neurogenic theory of the pathogenesis of pneumonia and also its application to suppurative diseases of the lungs.

SUMMARY

The recognition of the significance of the nervous system in the development of suppurative diseases of the lungs allows us to draw several important practical conclusions in connection with the conservative treatment of pulmonary suppurations. Therapeutic measures must exercise direct influence not only on micro-organisms in the lungs but on the patient's nervous system as well, changing the reactivity of the human organism; just from this point of view the favorable therapeutic effect of blood transfusion during suppurative diseases of the lungs should be valued. The very effect of antibiotics that are widely used in the Soviet Union in the treatment of pulmonary suppurations should be also looked upon and studied not only from the point of view of its effect on the micro-organism but also on the macro-organism. In general all organization of medical assistance should be centered on the patient, creating for him such conditions which would raise his ability to fight the disease, would ease his struggle with it. An early diagnosis, timely hospitalization, dispensary observation after discharge from the hospital assure favorable results in the treatment of this serious illness.

RESUMEN

El reconocimiento de la importancia que tiene el sistema nervioso en el desarrollo de las supuraciones pulmonares, nos permite extraer algunas conclusiones prácticas sobre el tratamiento conservador de ellas.

Las medidas terapéuticas deben influir no solamente sobre los microorganismos en los pulmones, sino que deben obrar también sobre el sistema nervioso del enfermo cambiando la reactividad del organismo humano. Desde este punto de vista la influencia de las transfusiones en las supuraciones debe valoarse.

El propio efecto de los antibióticos que son usados ampliamente en la Unión Soviética en el tratamiento de las supuraciones pulmonares, debe también estudiarse no solo por su efecto sobre los microorganismos sino sobre los macro-organismos.

En general toda organización de asistencia médica debe pla-
nearse tomando como centro el enfermo, creando para él condiciones que aumenten su capacidad de lucha para combatir la enfermedad. Un diagnóstico temprano, oportuna hospitalización, observación dispensarial después de salidos del hospital, aseguran resultados favorables en el tratamiento de esta seria enfermedad.

RESUME

La notion du rôle du système nerveux dans le développement des suppurations pulmonaires comporte plusieurs conclusions pratiques. Les mesures thérapeutiques ne doivent pas se contenter d’agir directement sur les bactéries des poumons, mais elles doivent également atteindre le système nerveux du malade. A ce point de vue, l'effet favorable de la transfusion sanguine au cours des suppurations pulmonaires doit être mis en valeur. L'action des antibiotiques, qui sont largement utilisés dans l'Union Soviétique pour le traitement des suppurations pulmonaires, doit être également prise en considération, non seulement du point de vue de leur effet sur les bactéries, mais aussi sur l'organisme du malade.

En général, il faut créer chez le malade des conditions meilleures de lutte contre l'infection pour en venir à bout. Un diagnostic précoce, une hospitalisation dans des délais convenables, et une observation continue par les dispensaire après départ de l'hôpital, sont les facteurs favorables de traitement dans cette sérieuse affection.