

Tuberculosis treatment in Poland at the turn of the 20th century (till 1914)

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Abstract: At the turn of 20th century on Polish territory tuberculosis was treated like in western European countries with conservative – symptomatic methods (climatotherapy, using dietotherapy) and invasive methods (pneumothorax, thoracoplasty). In fight against tuberculosis dr Seweryn Sterling stood out from all the Polish doctors at that time.

Key words: history of medicine, Seweryn Sterling, tuberculosis therapy

Tuberculosis (TB) has been present in humans since the dawn of time. In modern times, its incidence rate was increased in the 18th century. An increase in tuberculosis morbidity and mortality was a consequence of relieving Europe of the plague, whose victims were most of all fragile and ill people. One can even hazard a cynical guess that infectious diseases in the form of periodic epidemics, mostly the plague and smallpox, were related to an alarming death rate in people with TB, naturally “clearing” the continent of their excess. For the last time, plague epidemics appeared in Europe in the mid-18th century, probably as a consequence of driving the black rat out, which spreads the disease, by the common rat coming from Asia [1].

Smallpox also faced its vanquisher, Edward Jenner, who in 1796 worked out a method of immunization against smallpox, using a term of “vaccination” for the first time. Breaking the resistance of conservative medical circles, vaccination became widespread across Europe, bringing an enormous decrease in the morbidity and mortality rate caused by this serious disease.

In consequence, pulmonary tuberculosis started to play a dominant role among the diseases of high morbidity and mortality. The disease was causally associated with living conditions, lifestyle, nourishment and working conditions, i.e. the entire environmental and social relations of the patients [2]. Its evident epidemiological triumph did not escape the attention of men of literature – physicians and artists, who expressed their interest in the observed phenomenon on the pages of their literary works. In the 18th century in Poland, Antoni Formika classified “consumption” in the third group of the most common diseases [3]. Professor Władysław Szumowski,

reviewing the works of Leopold Lafontaine, a physician of the Polish Enlightenment, acknowledged the definitions used by him, like “cough”, “narrow chest”, “consumption”, “blood spitting” and “cachexia” as descriptions of symptoms of the same disease unit, i.e. tuberculosis [4]. Tuberculosis was mentioned by numerous memoirists of the 18th and the 19th centuries. The most famous Polish TB patient of the 19th century was Frederic Chopin. In the 19th and the 20th centuries literature showed a multitude of characters suffering from tuberculosis. They appeared in such famous works as “The Lady of the Camellias” by Alexandre Dumas son, “The Magic Mountain” by Thomas Mann or “The Birch Grove” by Jarosław Iwaszkiewicz.

Fictional descriptions of patients with TB also did not avoid therapeutic issues. The best example we can find in “The Magic Mountain”.

In the medical literature of the discussed period one can notice a keen interest in the TB treatment issues. Such literature served to transplant all the latest achievements in this field on to the Polish ground.

Tuberculosis treatment at the turn of the 20th century can be divided into non-invasive/symptomatic and invasive. In the then Kingdom of Poland, a physician of Łódź (a city in central Poland) Seweryn Sterling grew up to be a great phthisiast, who leaned mainly towards the climatic-dietetic-hygienic method of treatment [5]. Tuberculosis treatment methods used by him were appropriate to therapeutic rules of contemporary European medicine, having virtually no effective agent.

Theoretical grounds for climatic treatment of tuberculosis were established by Hermann Brehmer, a German and a follower of Rokitansky's school, who in 1854, as the first in Europe, opened a sanitarium in Goerbersdorf (currently Sokołowsko, Poland) in Silesia. In his therapeutic activity, Brehmer was governed by three basic principles: 1) mountainous climate, due to the lower air pressure, causes faster blood circulation, therefore, quickens the patient's pulse; 2) mixed diet with added alcoholic beverages is quite favorable to patients;

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Received: May 15, 2007. Accepted in final form: June 3, 2007.

Conflict of interest: none declared.

Pol Arch Med Wewn. 2007; 117 (9): 431-434

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3) TB patients should undergo hydropathic treatment in the form of cold showers. Publicity of such treatment greatly contributes to the establishment of many TB sanatoria across Europe, mainly in mountain or submontane towns. A follower of Brehmer, Peter Dettweiler, forced through a scientific view claiming that consumption can be treated in each climate where the air is fresh, clean and free from dust. He recommended a deckchair rest rather than cold baths, even on cold or frosty days [6].

Many associates and assistants of Brehmer were Polish. Tytus Chałubiński's son was cured in Goerbersdorf sanitarium, and this is where a famous Polish phthisiatrist Alfred Sokółowski made the acquaintance of him.

In 1882 Robert Koch discovered the tubercle bacilli and this influenced the trend in climatic-sanitarium treatment. In physicians' views on this issue, a Dettweiler's concept, based on a principle of clean air and observation of a therapy regime, was strongly consolidated.

In 1898, following the example of foreign facilities, Sterling organized a "chest patient ward" in the Israel and Leonia Poznański Hospital in Łódź and made attempts to provide his patients with large amounts of air and light, good personal hygiene conditions and a peaceful rest. In the "chest patient ward" there was a 75 m³ area of air and a 5 m³ area of light for each patient. The requirements imposed on each patient were approx. 5 hours of a deckchair rest in the garden or in the room and approx. 2 hours of walking in the garden or down the hospital corridors (movement and aerotherapy). Approximately 10 hours were dedicated to sleep. A daily schedule arranged this way was correlated with the optimal personal hygiene (washing the mouth and brushing teeth on waking up and after meals, overall washing, washing hands, an obligation to use spittoons, keeping a straight up posture while walking and during meals) [7].

A lot of weight was attached to calorific values and the quality and composition of meals for the patients. Food served to the patients was favorably diversified, and at the same time, a sensibly established ratio was kept between proteins, fats and carbohydrates. A normal diet was approx. 2819 calories per one patient. In the diet treatment fats and milk were preferred; each patient had 1 liter of milk and approx. 11 dg of fat in different forms and types of food. In the opinion of Sterling and contemporary physicians, pulmonary tuberculosis was a disease seizing the entire body, thus they were striving to strengthen the patients by means of available natural remedies. First of all, it was a dietary therapy. It is worth emphasizing that in his treatment Sterling departed from the widely adopted patient overfeeding regime [8].

In Europe TB preventoria and sanatoria were established in the belief that the hygienic-dietary method was effective in combination with the effect of healthy, dry climate. The first TB sanitarium in Poland was opened in 1879 on the initiative of Henryk Dobrzycki in Mienia near Mińsk Mazowiecki. In 1893 the Gajsler sanitarium was opened in Otwock, in 1898 the first center for TB patients in Zakopane and in 1909 a sanitarium

in Holosk Wielki near Lviv. In Łódź, the first suburban sanitarium, the Municipal Łódź Hospital for Patients with Slight Tuberculosis in Chojny, was established in 1915 [9].

From this point of view, pharmacological treatment of tuberculosis was regarded as secondary and complementary. Sterling considered in his therapy that "most symptoms should only be alleviated until they disappear along with subsidence of their reasons". Prior to the era of antibacterial medications, such a task was extremely difficult, often practically infeasible. Referring to a publication by Sterling entitled *Treatment of Lung Consumption in Hospital and at Home*, one can perfectly realize the methods of contemporary symptomatic treatment of tuberculosis (Tab.).

Pharmacotherapy applied by Sterling was quite diversified and fully compliant with contemporary medical knowledge.

Prior to the tuberculin era, physicians attempted to treat tuberculosis by means of a direct injection of antituberculosis substances into the lung parenchyma. Following the identification of the Koch's bacillus, the interest in that type of therapy increased, due to the fact that, as it seemed, the discovery created conditions for its scientific justification. The first attempts of such treatment were recorded in 1873, when Professor Mossler from Greifsfeld injected potassium permanganate solution to tubercular cavities in two patients, counting on triggering the proliferation of connective tissue in this way and thus healing the cavities. Professor Sokółowski applied similar treatment in 1880, injecting a weak carbolic acid solution and 2% of "iodine tincture"; in the mid-1870s carbolic acid was administered subcutaneously in patients of the Goerbersdorf sanitarium. Another agent administered subcutaneously, per rectum and in the form of direct injections to lung tissue was creosote.

In 1886, a French physician Bergeon from Lyon presented a quite original TB treatment method that consisted of performing per rectum injections of gaseous mixture of hydrogen sulfide, carbon disulfide, iodoform and "carbon gas" (probably carbon dioxide). Jan Tymowski tried to promote the method in Poland.

Physicians also attempted to treat tuberculosis with inhaled "thermal bacteria". Such therapy, developed by an Italian physician Cantani, was described in detail by Brehmer's assistant Teofil Stachniewicz.

Since the 1880s administration of tuberculin, discovered by Koch, was of a great importance in hospital, sanitarium and ambulatory-home treatment [10]. A considerable part of medical world was then seized with the "tuberculin frenzy", due to the fact that the new agent was considered a drug of properties similar to the other vaccines discovered a little earlier (Jenner, Pasteur). However, already several months after the introduction of the agent to clinical practice, comments warning against administration of tuberculin to TB patients appeared in the medical press. Views on this matter were divided and the new agent was promoted mainly by German physicians [11].

As early as in 1890 in Łódź, physicians tried to introduce tuberculin therapy on the initiative of the Łódź Medical

Table. Some of the most common methods of non-pharmacological treatment of tuberculosis in hospital and at home recommended and used by Seweryn Sterling at the beginning of the 20th century [15]

Symptoms	Management
Lack of appetite	Do not force a patient to eat; restricted, light diet; wine and food sharpening appetite; walks; warm compresses put on the stomach, possible gastric lavage
Dyspepsia	1–2 days of a strict diet; staying in bed
Fever	Depending on the type of fever, whether it was “continuous, intermittent or paroxysmal”, there were recommended continuous or several days of a bed rest, a liquid diet, a light diet, rubbing, chest T-bandage, vegetal diaphoretic and gentle laxative agents, tranquility, fresh air in a hospital room or at home
General weakness without fever	High calorie diet; wine, coffee, cacao; porching and walks in the open air; Swedish light gymnastics, or maintaining a horizontal position, not to impair heart function; hydrotherapy (bath, shower, rubbing with warm and cool water)
Bleeding and hemorrhage	Sitting or a semi-sitting position; cold compresses put on the chest in locations of supposed bleeding; limb tourniquets; pressure bandaging of the chest; no talks allowed; no rapid movements; after hemorrhage stops – a horizontal position
“Morning”, dry, paroxysmal cough, sputum evacuation problems	Dry T-band, and a wet, cool one (8–16°C) following its removal, then wiping the body dry and a horizontal position; wet canvas hydropathic jacket, dry flannel put on it; an appropriate (cough reducing) position of a patient; drinking mineral water loosening sputum, e.g. from Bad Ems, anti-cough herbs, milk and cod liver oil; smoking prohibited
Vomiting during coughing	Tight bandaging of the abdomen
Paroxysmal chills	Hot beverage with cognac, unless no predisposition to hemorrhage occurs; a horizontal position (warm bed)
Chest pain	Warm compress, unless no predisposition to hemorrhage occurs

Society. Sterling became interested in tuberculin quite early, but he tested it at the ward managed by him only in 1906. He believed (despite the fact, he knew the contraindications to its administration) that tuberculin provided favorable conditions for triggering the immunological response, which (owing to the fact that vaccination against it was sometimes possible) could lead to anatomical and clinical cure, mostly in a benign disease course, in a moderate course it could bring a significant improvement, and even halt the development of the disease in a severe course. Currently it is hard to determine how many Sterling's patients treated with tuberculin died and how many regained their health. Knowing the discoveries of Clemens P. Pirquet (allergy in 1903 and tuberculin skin test in 1907), Sterling also examined the diagnostic value of tuberculin, applying the agent in the form of skin tests in TB patients (all results were positive).

In contemporary clinical treatment, invasive TB treatment was also used. Artificial pneumothorax was one of them. Spontaneous pneumothorax has been known from the dawn of medicine and health care providers learned how to diagnose it at an early stage. Dyspnea, cyanosis and frantic anxiety are the most common symptoms of spontaneous pneumothorax.

Sterling's views on the issue were presented in a series of articles and clinical lectures, published under the title of *Treatment of Lung Consumption in Hospital and at Home* in various medical magazines in the years 1904–1909. The method was also described by Sterling in 2 extensive sketches entitled *Artificial Pneumothorax* [12] and *About Artificial Pneumothorax* [13].

The first experiments with artificial pneumothorax were carried out by a Scottish physician James Carson at the begin-

ning of the 19th century. Carson intended to test the elasticity of lung tissue depending on a gas introduced to pleura. He did not, however, hit on an idea to apply artificial pneumothorax to treat tuberculosis. Such an idea was conceived in 1882 in the mind of Carlo Forlanini, but theoretical deliberations and tests on animals had lasted ten years before Forlanini dared to test pneumothorax on humans.

Forlanini carried out the first pneumothorax induction in 1890, and two years later, at the 11th International Medical Congress in Rome, he presented the effects of pneumothorax treatment in the first two patients. Zbigniew Woźniakowski established that the forerunner of pneumothorax treatment in Poland was, in 1908, Tadeusz Borzęcki. Pneumothorax was introduced to pulmonary tuberculosis treatment in Łódź by Sterling. In 1911 Sterling assisted by Maria Szapiro carried out thirteen inductions of artificial pneumothorax on the pulmonary ward of the Israel and Leonia Poznański Hospital in Łódź. It is a well-known fact that between 1911 and 1914 Sterling provided 55 patients with pneumothorax treatment. Based on the existing data, one can say that in 50% of cases the effects of pneumothorax treatment in Łódź were positive and led to achieving better results than the same therapy (33 patients) in the Kazimierz Dłuski sanitarium in Zakopane [14].

In TB treatment, Sterling also used so-called Kuhn's mask, of a shape similar to the chloroform mask. Kuhn's mask was used to trigger passive congestion of the lungs. It was, therefore, a practical application of the Bier block to treat tuberculosis. Congestive hyperemia was obtained by means of putting on the mask hindering inhalation of air into the airways.

Forced inspiration increased negative pressure in the chest, therefore increasing pressure in the right ventricle of the heart and slowing down the process of emptying the pulmonary veins of blood. When both the arteries and lung veins were widened, congestive hyperemia occurred, which, according to the Bier theory, reduced the impact of TB foci and provided favorable conditions for the development of connective tissue.

Positive effects of pneumothorax were sometimes hindered by so-called adhesions. Both the attempts to cut the pleural adhesions after opening the chest, and cauterizing them with electrocauter gave no expected effects. Only in 1910 Swedish physician Hans Christian Jacobaeus published the method of cauterizing the adhesions connecting the parietal pleura with the pulmonary pleura, using a cystoscope. The outbreak of World War I made it impossible to popularize this method in Europe, including Poland.

Also shortly before the outbreak of the war, a German E. Stuertz put forward a suggestion for treating tuberculosis lesions located in lower lobes of the lungs by cutting the phrenic nerve. Experiments showed that after cutting the nerve, the diaphragm assumed the inhalation position i.e. was raised. Although such surgeries were performed quite often, they not always had positive outcomes. In order to improve the effect, with time, the physicians started to tear out the phrenic nerve, attempting to break the connections of its all branches. The development of this TB treatment method coincided with the interwar period.

The invasive methods of tuberculosis treatment included also the thoracoplasty, which essence was to deprive lungs of their natural armor, viz. ribs, due to the fact that after the ribs were extensively cut out, the lung parenchyma seized by tuberculosis lesions caved in. The first accurate descriptions of this method were provided in 1908 by Paul Leopold Friedrich and concerned two operated patients. In 1912, in Poland, Zdzisław Dyndelski, performing a surgery, decided to select thoracoplasty, contemporarily proposed by Professor Max Wilms of the Heidelberg University and consisting in removing small (3–4 cm) sections of all ribs located close to the spine. The Wilms method aimed at narrowing the rib cage, therefore, in the post-operation period, the operated side was provided with the special pressure dressing. Thoracoplasty was widely used in the interwar period.

Before World War I, physicians also worked out a concept of producing free extrapleural space, i.e. so-called pneumothorax chamber, which, protecting against being filled with expanding lung, was sealed with paraffin. This method was tried in treatment of cavernous tuberculosis. In Poland, the first such surgery was carried out in 1931 by Władysław Ostrowski.

In Poland no resection of lung tissue due to tuberculosis was carried out before the outbreak of World War II.

After the period of tuberculin emotions, physicians started a frantic search for other “miraculous” anti-TB agents. At the beginning of the 20th century, it was ioretin, also called griselin, which was supposed to be a totally effective agent. Some

time later, similar properties were attributed to calcium and phosphorus. In the 1920s, sanocrisin, a gold preparation, was introduced to TB therapy. In 1927 it was replaced with lien, i.e. spleen extract. The end of the 1930s was a period of treatment of tuberculosis with copper. However, only the discovery of streptomycin by Selman Waksman in 1944 was a real turning point in the therapy of this serious disease.

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