

The history of tuberculosis treatment in West Pomerania, Poland

Marcin Kołodziej^{1, A}, Michał Spieszny^{2, B}, Maciej Sołtysiński^{3, C}, Bartłomiej Pala^{4, D}, Zuzanna Nowaczyk^{4, E}, Tomasz Pala^{4, F}, Urszula Czekajło-Kołodziej^{5, G}, Michał Piotrowiak^{6, H}

¹ Pomeranian Medical University Hospital No. 1, Pediatric, Oncology and Child Immunology Department, Unii Lubelskiej 1, 71-252 Szczecin, Poland

² Pomeranian Medical University Hospital No. 1, Pediatric Emergency Department, Unii Lubelskiej 1, 71-252 Szczecin, Poland

³Independent Public Provincial Complex Hospital in Szczecin, Department of Gastroenterology and Internal Medicine, Arkońska 4, 71-455 Szczecin, Poland

⁴ Pomeranian Medical University Hospital No. 1, Department of Pediatric Neurosurgery and Neurosurgery, Unii Lubelskiej 1, 71-252 Szczecin, Poland

⁵109. Military Hospital in Szczecin, Laboratory Medicine Team, Księdza Piotra Skargi 9/11, 71-422 Szczecin, Poland

⁶Piotrowiak Clinic, Strzelców Karpackich 20, 71-806 Szczecin, Poland

^AORCID: 0000-0002-1216-4905; ^BORCID: 0000-0002-2992-5424; ^CORCID: 0000-0002-5602-6782; ^DORCID: 0000-0002-4156-6604; ^EORCID: 0000-0001-5363-1090; ^FORCID: 0000-0002-3169-9905; ^GORCID: 0000-0003-3976-0325; ^HORCID: 0000-0001-8591-1716

🖂 pala.b@edu.pum.edu.pl

ABSTRACT

Tuberculosis is a widespread disease whose treatment in the West Pomeranian region dates back to the end of the 19th century. After World War II, the main place responsible for tuberculosis management was the National Tuberculosis Sanatorium, known today as Specialist Hospital in Szczecin – Zdunowo. Initially, treatment involved a high-calorie diet, the use of copper or gold salts, tuberculin injections, light therapy, and appropriate

THE HISTORY OF TUBERCULOSIS IN WEST POMERANIA

The incidence of tuberculosis in Europe has been observed since the 16th century, with the peak at the end of the 19th century. It gradually spread from Europe to other continents -Asia in the 19th century and Africa in the 20th century, where the prevalence of tuberculosis is now the highest [1].

Tuberculosis is a social disease that occurs in all ages and across all professional and social groups. The most common form is pulmonary tuberculosis (90% of all cases), while the extrapulmonary form (pleura, lymph nodes, urogenital system or osteoarticular system) is less common. Its incidence is the highest among older adults (45-64) and is more prevalent among men than women [1]. According to occupation, the highest incidence can be found among doctors, nurses, and microbiologists, due to contact with patients and infected material [2, 3].

Mycobacterium tuberculosis belongs to the genus Mycobacterium which derives its name from fungus (Greek: myces fungus, bacterium - bacillus). These are elongated, rod-shaped bacteria (mycobacteria) without cilia, not enveloped, and not producing toxins or spores. They are aerobic, slow-growing bacteria (generation time 18 h) with high nutritional requirements. Their characteristic feature is resistance to Gram staining, also when using aniline dyes, and they do not discolor when exposed to a mixture of alcohol and acid. It is the high content of lipids in the cell wall (60% dry weight) that gives the mycobacteria acid resistance, hydrophobicity, environmental conditions. However, positive results had rarely been achieved before the introduction of antibiotics in tuberculosis treatment in the mid-20th century. Interestingly, the prevalence of tuberculosis in West Pomerania in Poland has been significantly lower compared with national figures. Keywords: West Pomerania; mycobacterium tuberculosis; tuberculosis management.

and resistance to environmental factors such as drying or freezing [4, 5].

All these features are conducive to survival in an inanimate environment for weeks or even months. Although mycobacteria are a small group of microorganisms, they are very important due to their pathogenicity [1].

HOSPITAL TREATMENT OF TUBERCULOSIS IN WEST POMERANIA

The inpatient treatment of tuberculosis in the formerly German city of Szczecin dates back to 1892 when an association to fight tuberculosis was established, later known as the Society for Fighting Tuberculosis (existing until the World War II). Contrary to other European countries, where tuberculosis wards were located in old and neglected buildings, the authorities of Szczecin decided to build a special center for tuberculosis patients - an innovative approach to the disease that acknowledged the severity of the problem. Hohenkrug bei Augustwalde (currently Zdunowo) was chosen for the construction site of the hospital, due to its location in the nearby forest close and easy access by train. The money needed to build a modern and large hospital was donated by Ferdinand Karkutsch, a local businessman and philanthropist, and the construction was completed in 1930. Research conducted at the new facility produced results that significantly contributed to the knowledge about the disease. Szczecin became one of the first cities in



Europe to use radiological screening tests to detect tuberculosis and monitor the course of the disease.

After World War II, the hospital received new specialist equipment and was significantly renovated before the ceremonial opening as the new National Tuberculosis Sanatorium in 1949. In the same year, the Provincial Tuberculosis Clinic was launched at its premises, to treat, prevent, and control the spread of tuberculosis. In 1950, the Thoracic Surgery Department was established, the next year Bone and Joint Tuberculosis Treatment Department, while 1958 saw the creation of the Department of Tuberculosis of Genitourinary Organs. In 1962, the Provincial Outpatient Clinic for Tuberculosis merged with the Tuberculosis and Lung Diseases Hospital in Szczecin, creating the Specialist Team for Tuberculosis and Lung Diseases (a facility connected to the Specialist Hospital in Szczecin-Zdunowo in 2010). In 1971, the Department and Clinic of Phytosiatry of the Medical Academy became part of the hospital (established in 1955, it operated on the premises of today's hospital at Arkońska Street 1). The National Tuberculosis Sanatorium was transformed into the Provincial Physio-Pulmonology Hospital, and then into the Prof. Alfred Sokołowski (1849–1924) Specialist Hospital in Szczecin – Zdunowo [6, 7]

The introduction of new treatments has resulted in a decline in tuberculous patients and a gradual reprofiling of the hospital to the treatment of lung cancer and chronic obstructive pulmonary disease. Currently, the Independent Public Provincial Complex Hospital in Szczecin is an independent public health care facility with referentiality level III which specializes in the treatment of respiratory diseases, internal diseases, and diseases of the osteoarticular system.

Pioneers of tuberculosis treatment in the West Pomeranian Voivodeship

The pioneers of tuberculosis treatment in West Pomerania were Karl Schudard (director of the City Hospital) and Ernst Neisser (brother of Albert Neisser - the discoverer of gonorrhea) the 1st director of the City Hospital in Szczecin (1895–1931), who created a specialized sub-department at the Department of Internal Diseases in Szczecin for observing suspected tuberculosis carriers. He also opened a clinic in Pommersdorf (today Pomorzany) intended to observe patients with a strong reaction to tuberculin despite no clinical signs of tuberculosis. A number of diagnostic and therapeutic procedures were also performed there, such as preventive examinations, sputum tests for the presence of mycobacteria, and giving patients tuberculin injections. In the years 1911–1915, Dr. Braeuning became the head of this clinic. Despite the great interest in the subject of tuberculosis, the beginning of the 20th century was still a period in which most of the infected patients died due to the lack of appropriate treatment methods. In 1915, after building the hospital in Hohenkrug bei Augustwalde (today Zdunowo), Dr. Braeuning became its director, for which he was perfectly prepared following the years of work with Prof. Ernst Neisser. Under Dr. Braeuning, the hospital became the best tuberculosis center in Germany in terms of research, training, and patient care.

After World War II, when the hospital was handed over to the Polish authorities, it was named after Prof. Alfred Sokołowski and continued its therapeutic activities for tuberculosis patients. Professor Sokołowski, even though he was not personally associated with this hospital, was one of the pioneers of modern treatment of respiratory diseases in Poland and the founder of the Tuberculosis Society in 1908. The professor also introduced an innovative method of tuberculosis diagnostics based on clinical symptoms, and described the so-called tuberculosis masks (pseudo-influenza, pseudo-asthmatic, pseudogastro-intestinal, pseudo-cardiac, etc.) [8, 9].

Treatment and prevention of tuberculosis

The beginnings of tuberculosis treatment were characterized by a completely different approach to the disease than the one used today. The effects of the therapy at the turn of the 20th century were usually unsatisfactory and most of the patients died. Many methods of fighting the disease were tried, e.g. recuperating in places with appropriate environmental conditions ("sanatoriums"), a high-calorie diet, treatment with copper or gold salts, and even tuberculin injections or light therapy (mycobacterium tuberculosis is sensitive to UV). In the 20th century, several attempts were made to treat tuberculosis surgically. Methods such as pneumothorax production (sometimes extended to rib resection/cutting) or burning adhesions in lungs, known as collapse therapy, were gaining in popularity. During this procedure, one or both of the patient's lungs were immobilized alternately, causing their collapse by creating a pneumothorax or by filling the epithelial chamber with sterile paraffin (known as extrapulmonary fillings).

Another method was the unilateral diaphragm immobilization caused by surgical destruction of the phrenic nerve in the area of its cervical course. At the hospital in Hohenkrug, such surgeries started in 1932, at a rate of over 100 per year. At the same time, patients with tuberculosis of bones and the genitourinary system were transferred there from the Main City Hospital in Pommersdorf. Before the outbreak of World War II, the daily hospital load was 274 patients [7].

The discovery of anti-tuberculosis antibiotics was a breakthrough in the fight against tuberculosis. The 1st antibiotic used was glycoside-streptomycin, discovered in 1944. In the 1950s, isoniazid, pyrazinamide, cycloserine, and kanamycin were discovered, while the 1960s brought ethionamide, ethambutol, and rifampicin. Clofazimine, introduced in the 1980s for the treatment of leprosy, was approved for use in anti-tuberculosis therapy only in 1996 [4].

Standard antituberculosis therapy requires a treatment period of 6 months, divided into 2 phases. The 1st intensive phase lasts 2 months in which the patient receives 4 basic medications. This is followed by a maintenance phase in which 2 antibiotics are given. It effectively treats the disease, and, in contrast to the former methods, the therapy results in a significant decrease in tuberculosis mortality.

Tuberculosis vaccinations result in a lower incidence rate [1]. General vaccination against tuberculosis using the Polish Bacillus Calmette–Guérin (BCG) vaccine produced in Lublin (Brazilian Moreau sub-strain) began in 1955 [10]. Before the introduction of universal vaccinations in Poland, they were organized by the Pasteur Institute or the Danish Red Cross. Until 2006, vaccinations were performed several times, even 7 times, according to the vaccination schedule. One vaccination is currently being performed as revaccination has been found to be ineffective [11]. The BCG vaccine is administered on day 1 of a child's life and it is mandatory in Poland [12, 13].

Declaration of the WHO from 1993, recognizes this disease as a constant global health threat. In its plans from 2015, WHO wants to reduce the incidence of tuberculosis by 80% by 2030 and its complete elimination in low-incidence countries by 2050 [14, 15].

Tuberculosis in numbers

After the end of World War II, the incidence of tuberculosis in Poland was the highest in Europe and amounted to 290 per 100,000 inhabitants (data on tuberculosis incidence in Poland have been available since 1957). This alarming situation necessitated the introduction of a national tuberculosis program in 1959 [16].

As a result, the number of cases of tuberculosis has been gradually decreasing for several decades and now amounts to 13.9 per 100,000 people [13, 14, 15]. According to the findings of the European Center for Disease Prevention and Control (ECDC), the incidence rate is lower than 20/100,000 people and is defined as low. With the incidence below 10 per 100,000 people, one can speak of approaching the elimination phase of the disease. Despite the decline in tuberculosis incidence, the average incidence in Poland still exceeds the EU average of 10.2 per 100,000 population [15].

All over the world, including Poland, local differences in incidence can be observed. In 2015, the highest incidence of tuberculosis was recorded in the following regions: Lublin, Silesian and Masovian, and the lowest in the following regions: Wielkopolska, Warmian-Masurian and West Pomeranian.

In the West Pomerania region, the incidence in 2019 was below 12.4/100,000, which is lower than the national average (13.9/100,000). There were a total of 211 cases, including 198 new cases and 13 relapses. These data indicate that the situation in the West Pomeranian region is one of the best in Poland (10th in terms of incidence). This is associated with the limited number of patients with the reactivation of a pre-existing disease, a low number of drug-resistant tuberculosis cases, and a relatively low influx of migrants from regions with high incidence.

CONCLUSIONS

The area of the West Pomeranian province has a long history of modern tuberculosis treatment. After the incorporation of eastern German territories into Poland, the Polish authorities decided to restore the hospital in Zdunowo, which was intended primarily for the treatment of tuberculosis and other lung diseases. Despite the initial difficulties with finding staff and financial shortages, the hospital began to rebuild its reputation over the years, becoming a leading center in Poland. Its goals have changed over the years. Once, the goal was to stop the epidemic and decrease the mortality rate, and today the biggest challenge is to stop the development of drug-resistant strains. Although in the 1960s it was thought that tuberculosis could be completely eradicated with vaccination and targeted treatment, it returned as a global health problem. A report published by the ECDC, shows that the rate of decline in tuberculosis incidence in Europe may not be sufficient to eradicate the disease [17]. For this reason, it can be assumed that the hospital in Zdunowo will long be needed for fighting and preventing tuberculosis in our region.

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