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Incidence of tuberculosis in the Tatras region

Abstrakt

The authors point out that tuberculosis is the oldest infectious killer of humans and today it is such a serious threat to health that the World Health Organization (WHO) equates it to a time bomb. The most common source of infection by mycobacteria tuberculosis to a man is a sick person. Epidemiologically greatest danger is sick person with untreated decay pulmonary tuberculosis whose sputum may spread billions of tuberculosis bacilli every day. The overall situation in the incidence of tuberculosis (TB) in Slovakia is generally favorable, although in the eastern parts of Slovakia incidence is growing rapidly. Slovakia has compared with all Europe small to moderate incidence of this disease and its incidence has downward trend. East Slovakia so far has not won combat this disease yet. It is therefore necessary to continue effective intervention and prevention to combat the spread of this disease.

Key words: pulmonary tuberculosis, extrapulmonary tuberculosis, epidemiological situation, region, vaccination

INTRODUCTION

If the importance of disease is measured by the number of victims, the most feared infectious diseases like plague, cholera and others would stay far behind the tuberculosis.

Robert Koch: Die Aethiologie der tuberculose (1882).

Tuberculosis is the oldest infectious killer of humanity and even today remains such serious threat to health that the World Health Organization (WHO) equates it to a time bomb. If humanity fails to defuse this „bomb” it may happen that one day we will have to fight the disease which is resistant to drugs and can be spread by air and is virtually incurable as well as AIDS is today (Bajan, 1996).

HISTORY OF TUBERCULOSIS

Tuberculosis is a disease known since beginning of time, we can say that it is as old as mankind itself. The first reports of it were found at a time when people began to create greater social units (10). As the oldest evidence of the existence of tuberculosis may be considered findings of K. Pfaff from r. 1904 in Heidelberg – finding of skeletons from the Neolithic age (6000 - 2000 BC), which showed pathological changes in the upper thoracic spine, the fourth and fifth thoracic vertebra were destructed by pathological process, which is described by Bartels as spondylitis tuberculosis. As the first comprehensive picture of ftisis from which drew all physicians many centuries, should be considered Hippocrates's (466-370 BC) Corpus Hippocraticum. Hippocrates described symptoms of this illness such as cough, coughing up blood, fever, sweating, and explains the genesis of tuberculosis by humoral concept. His work did not yet notice the contagiousness of this disease. Based on other similar descriptions of the symptoms of tuberculosis by other authors can be concluded that this disease must have been widespread at that time (Bajan, 2000). Robert Koch (1843 - 1910) became thanks to his work on infectious diseases one of the greatest explorers of humanity. At the Berlin meeting of physiological society on 24 March 1882 in famous speech „Über Tuberkulose” he reported on his discovery of the bacillus tuberculosis and thus proved parasitic nature of this infectious disease.

BASIC CHARACTERISTICS OF DISEASE

Tuberculosis is infectious disease caused primarily by *Mycobacterium tuberculosis*, rarely by *Mycobacterium bovis* and by *Mycobacterium avium*. It mainly affects lungs, but mycobacteria can cause disease process in extrapulmonary structures. In connection with immunocompromised states increase the occurrence of mycobacterioses that are caused by other mycobacteria and by so called atypical mycobacteria (*Mycobacterium avium* complex, *Mycobacterium xenopi*, *kansasii*, *fortuitum*). According to WHO criteria, the TBC is according to stricken organ divided into:

- a) pulmonary TB
- b) extrapulmonary TB

SOURCE OF INFECTION

The most common source of infection by mycobacteria tuberculosis to man is a sick person. Epidemiologically greatest danger is sick with untreated decay pulmonary tuberculosis whose sputum may every day spread billions of tuberculosis bacilli. Very often it is spread as droplet infection, which is caused by the direct transfer of small droplets with bronchial or oral content that is spread into surrounding when is sick person coughing, sneezing or speaking. Much more serious is infection with dust. Dust penetrates deeper into the respiratory tract than droplets. The infection is remains in the dust for several hours. Tuberculosis can be transmitted also by food (digestive transmission), for example from non-boiled

milk from tuberculous cows, which is today virtually absent because of veterinary controls. There is possible also hematogenous transmission from mother to fetus. The most common gateway is the respiratory tract, as evidenced by the high proportion of pulmonary tuberculosis, which constitutes 80 to 90 % of all forms of this disease. The clinical picture of tuberculosis is largely affected by various pathologically-anatomical forms. Tuberculosis can be divided to primary and postprimary.

SYMPTOMS OF TUBERCULOSIS

In the early stage tuberculosis does not cause any significant or characteristic problems, about 20% of patients do not show any difficulties (asymptomatic form). That is actually its deceit. The vast majority those diseases are, however, found only after difficulties occur. Clinical signs can be divided into general and organ-related problems which are connected with their dysfunctions (Winthrop, 2006). The general symptoms include feeling of constant fatigue, which occur initially in the afternoon and in later stage already in morning after awakening, fatigue, weight loss and loss of appetite. Most common is a fever or subfebrility (up to 38 ° C) lasting 2-3 weeks, which usually increase after physical or mental exertion. There are also other symptoms such as excessive sweating, especially early in the morning, pain in the joints, sleep disturbances, impaired ability to concentrate and neurotic disorders (Pacovský, 1993).

Organ or functional symptoms manifest themselves depending on which organ was affected by tuberculosis. In the pulmonary form is in the forefront coughing. It may be dry, nonproductive or productive coughing with mucus or septic sputum, sometimes with blood. Furthermore it can also be vaguely localized chest pain. **Extrapulmonary forms of tuberculosis arise most often from hematogenous dissemination of the primary process. For example, in the affected kidney is at the forefront hematuria (microscopic or macroscopic), pollakiuria, bacilury of mycobacteria and renal dysfunction.** In case of damage of nervous system (such as basilar meningitis) are manifested neurological symptoms - headaches, vomiting, double vision, sensitivity to light and noise, disorientation or fainting and later unconsciousness, convulsions, and so on (Bajan, 1990).

DIAGNOSIS OF TUBERCULOSIS

Pulmonary tuberculosis has diverse X-ray images, which become typical in the advanced stages of disease. Images must be repeated after in defined time periods to monitor the progress of disease. Among other examinations belongs tuberculin reaction. It is performed using the tuberculin test. Tuberculin test with intracutaneous application of tuberculin (pure mycobacterial protein) is called Mantoux (by inventor Charles Mantoux). According to used concentration is distinguished Mantoux I, II and III, but most used is Mantoux II. (Solovič et al., 2008). The diagnosis of tuberculosis can be absolutely proven if the originator (tubercular bacteria) is proven. For this is used microscopic examination of sputum or other biological material.

The incidence of infectious diseases in population significantly increases. National register of Tuberculosis in the Czech Republic recorded in the year 2010 680 new cases of TB (Komárek, Provazník, 2011).

TREATMENT OF TUBERCULOSIS

Treatment of tuberculosis has two stages. The first is very intense and include administering up to five drugs. In our conditions is this phase almost always performed in inpatient care or in medical institutions. In the second phase are administered two or three drugs (Horsburgh, 2004). This treatment is usually done at home and should be supervised specialists from clinics. The above-described situation is ideal. If there is compliance with this regime, virtually all patients are healed and spread of tuberculosis is limited. As we see in recent years, Slovakia is successful. Omitting of any of these procedures can lead to the spread of so-called. polyresistant tuberculosis, which globally represents a great danger for the future.

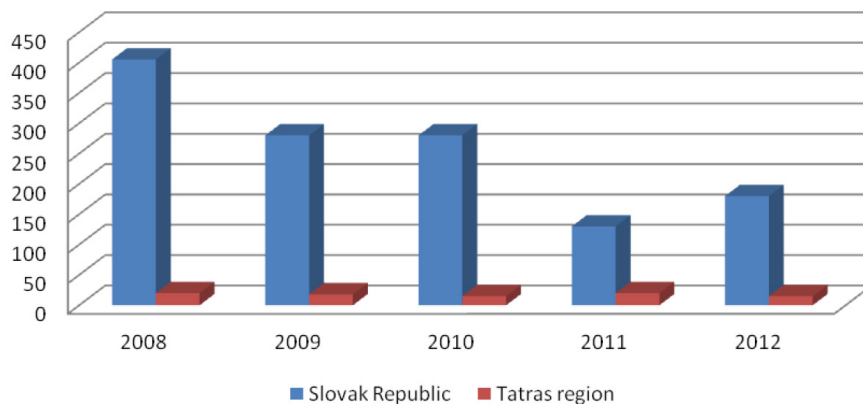
Possibilities of prevention of tuberculosis:

- reporting cases of TB
- screening of risk groups
- diet

EPIDEMIOLOGICAL SITUATION OF TB IN SLOVAKIA

Occurrence of tuberculosis in Slovak Republic and in Tatras region in last 5 years

GRAPH # 1



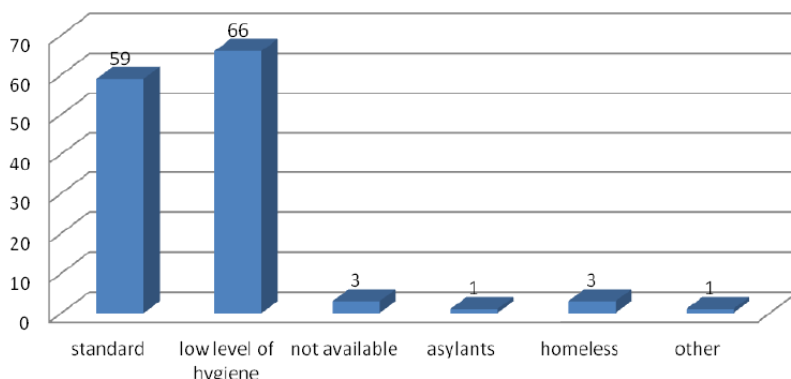
The overall situation in the incidence of tuberculosis (TB) in SR is favorable, although the eastern parts of Slovakia it is growing rapidly. Slovakia is compared with all Europe country with a small, respectively moderate incidence of this disease and its incidence has downward trend. According to the National Register of tuberculosis, while in Trnava, Nitra, Bratislava, Trenčín, Žilina and Banská Bystrica regions morbidity ranged from 4.01 to 6.13 / 100 000 inhabitants, in eastern Slovakia – in the Prešov (13.96 / 100,000 pop.) and Košice (10.51 / 100 000 inhabitants) regions morbidity was significantly higher. From an epidemiological point

of view it is especially important to systematically smear and culture also carry out bacteriological screening of newly identified TB suspects, as well as bacteriological examination of recorded tuberculosis cases. Since the source of infection may not only be a sick human but also a sick animal, it shall not be forgotten in preventing tuberculosis suspects to search animals for TB, which belong into the job description of veterinarians (Gulášová, Görnerová, Bačíková, Švecová, 2012).

ANALYSIS OF EPIDEMIOLOGICAL SITUATION IN THE TATRAS REGION FOR THE PAST 5 YEARS

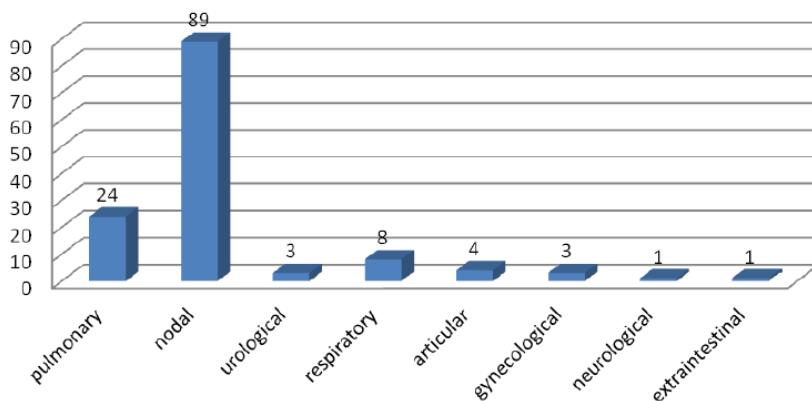
This analysis includes districts of Poprad, Kežmarok and Levoča, what is the region belonging to the catchment area RÚVZ Poprad. Data were drawn from the epidemiological information system EPIS, to which are reported all infectious diseases, including tuberculosis. It should be noted that the report given by doctors and laboratories is still not complete and the data may not match the data from the NRC for tuberculosis in NÚTPCHaHCH Vyšné Hágy. The number 133 of cases in last 5-year period shows that tuberculosis in the region is still current problem (Solovič, 2008).

Division of tuberculosis cases in Tatras region in last 5 years according to the social environment



GRAPH #2

Division of tuberculosis cases in Tatras region in last 5 years according to the clinical form



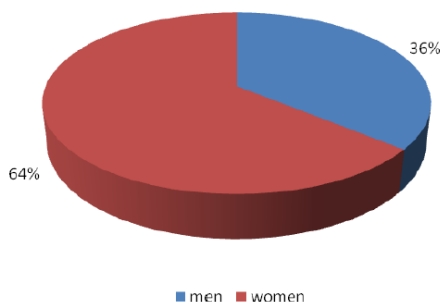
GRAPH # 3

High Tatras region as well as the rest of eastern Slovakia is specific by a high proportion of minority population. Roma ethnic has group in comparison with the majority society some specifics that apply in the process of contagion and affect the evolution of the epidemiological situation, resulting in the occurrence of the epidemic (6 cases), tuberculosis reported in 2011 in Podtatranská Hranovnica settlement (Solovič, 2008). Among the specificities of this minority population belong particularly high unemployment, poor socio-economic conditions, often multigenerational living together in settlements without basic hygiene standard, non-cooperation, often illiteracy, inability to complete the examination of contacts. The data in the graph show the increased incidence of this disease in persons with low hygienic standards, i.e. in the Roma population. Graph No 3 divides the disease according to clinical forms of tuberculosis. The most common clinical form of tuberculosis was nodal form that accompanies pulmonary form of this disease.

From Graph No 4 is clear that the most affected group of tuberculosis are men.

Division of tuberculosis cases in Tatras region in last 5 years according to the gender

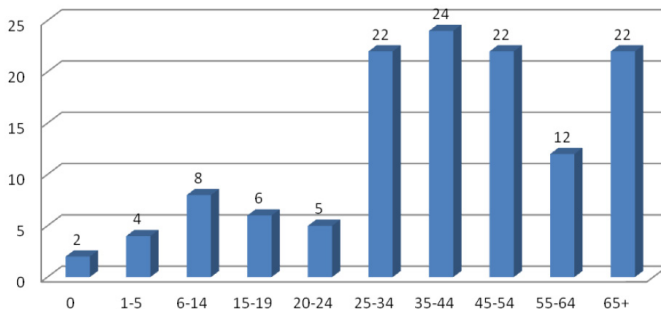
GRAPH # 4



Graph No 5 shows that the most affected group are persons of working age, although also childhood tuberculosis cases were recorded.

Division of tuberculosis cases in Tatras region in last 5 years according to the age

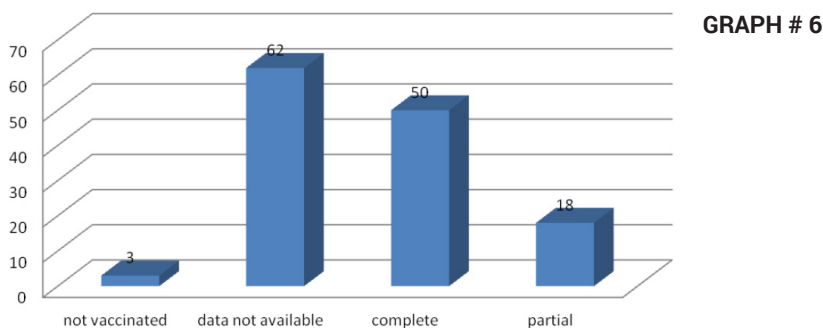
GRAPH # 5



INOCULATION

Regular vaccination against tuberculosis was in Slovak Republic mandatory till 31 December 2011. To this day, its meaning all over the world is widely debated. We can say that that vaccination of children significantly reduces the number of complex forms of tuberculosis. In some countries, where the incidence of tuberculosis is very low, are vaccinated against tuberculosis only certain groups. However, it is important to know that a vaccinated person can become ill with tuberculosis, but its course is usually less severe than in unvaccinated. As in many other countries, Slovak government finally made a decision and amended this Act, which came into force on 1 January 2012 and compulsory vaccination against tuberculosis in Slovakia is canceled.

Data about vaccination of tuberculosis patients in Tatras region in last 5 years



Graph No 6 shows that only less than 38% of patients were fully immunized against tuberculosis, in other cases vaccination was incomplete or vaccination data are not recorded properly.

CONCLUSION

In this article we analyzed the epidemiological situation of TB in Slovakia in Tatras region. Although it can be said that Slovakia is a country with a low incidence of tuberculosis in recent years, Eastern Slovakia region so far has not won combat with this disease yet. It is therefore necessary to continue with effective intervention and prevention to combat the spread of this disease. It would be interesting to perform a study, which would deal with extrapulmonary TB.

REFERENCES

1. BAJAN, A.1990. Tuberkulóza [Tuberculosis]. Martin: Osveta, 1990
2. BAJAN, A. et al.1996. Tuberkulóza a ako sa pred ňou chrániť [Tuberculosis and how we can protect against it]. Bratislava: Ústav zdravotnej výchovy, 1996
3. BAJAN, A.2000. Tuberkulóza ako medicínsky problém na prelome tisícročia [Tuberculosis as a medical problem at the turn of the millennium]. In: Stud. Pneumolog. Phtiseol., 2000, roč.60, č.1, s.4-6, ISSN 0371-2222

4. GULÁŠOVÁ, I., GORNEROVÁ, L., BAČÍKOVÁ, Z., ŠVECOVÁ, J: 2012. Second annual International conference, Jihlava Health Care Day, College of Polytechnics Jihlava. 2012, 1073 p., ISBN 978-80-87035-52-8
5. HORSBURGH, C, Robert. 2004. Priorities for the Treatment of Later Tuberculosis Infection in the United States. NEHM, zv. 350, n. 20, 2004, p. 2060-2067
6. KOMÁREK, L., PROVAZNÍK, K. 2011. Ochrana a podpora zdraví [Prevention and support of health]. Praha, Nadace CICNDI, 3. lékařská fakulta UK, 2011, 99 s., ISBN 978-80-260-1159-0
7. PACOVSKÝ, V.1993. Vnútorné lekárstvo [Internal Medicine]. Martin: Osveta, 1993
8. SOLOVIČ, I. a kol. 2008 Tuberkulóza. Vybrané kapitoly [Tuberculosis. Selected chapters]. Poprad: Slza, 2008, 197 s., ISBN 978-80-970024-4-2
9. ZELLWEGER, Jean - Pierre 2008. Latent Tuberculosis - Which Test in Which Situation? Swiss Med Wkly, zv. 138, 2008, s. 31-37
10. WINTHROP, Kevin, I. 2006. Risk and Prevention of Tuberculosis and Other Serious Infections. Nat Clin Pract Rheumatol, zv. 2, n. 11, 2006