TUBERCULOSIS IN DETENTION - A RISK FOR PUBLIC HEALTH

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CONTEXT
Tuberculosis is an infectious disease caused by Mycobacterium Tuberculosis and represents one of the worldwide spread diseases with high morbidity and death rates and high socio-economic costs.

In 1993 the World Health Organization declared TB as being a worldwide emergency/priority. It is estimated that by 2025 almost a billion people will have been infected with novo, 200 million will develop active tuberculosis and 40 million will have died of TB, unless the control programs are improved.

At international level, the prevalence and mortality rates have decreased in the past years, but the TB incidence rate has reached a peak in 2003. Despite the increasing number of population in the countries strongly affected by TB, the total number of new cases increased quite slowly in 2006.

This rather stationary image of the global epidemic hides great variations in the TB infection trend throughout different regions. Thus, the infection cases among people in industrialized countries recorded annually a decline, but they are stationary or quite increasing among immigrants. It is estimated that 1.7 million people died of tuberculosis in 2006. After HIV/AIDS, TB is placed on the second place in the top of infectious agents causing death [1].

Placing detainees in the category with a high risk of disease is due to the fact that they frequently come from the most vulnerable social segments such as: low income population, people with mental disorders or drug and alcohol addiction. Therefore, this segment of population is at high risk of disease, even previously to be in prison.

The first steps towards solving the special group’s needs consist in identifying the groups and their needs. These steps should be taken in cooperation with the beneficiaries and other people engaged in solving social problems. Each medical service which is involved in this issue should have a plan of controlling the TB infection. The plan should include protective measures for the medical units (rules, procedures etc.), the environment and the staff involved in healthcare providing so that the risk for TB infection spreading to be minimized. Incarceration itself has been described and recognized as one of the risk factors for the infection with the M. Tuberculosis. Several studies have concluded that infection rates in prisons are by 10 to 100 times higher than rates among the rest of the population [2].

In this context, we have considered important to carry out a research study on tuberculosis in detention environment, because this phenomenon affects the general population by transmission of the disease when the detainees are transferred from an institution to another or when they are released, or via the prison staff or visitors. This risk of transmission of the disease requires a good knowledge and documentation and analysis of the phenomenon. Therefore, it is essential to have public health strategies having as target to eradicate the TB infection. Such strategies should be comprehensive and include the prison condition where is recorded the highest rate of infection with TB.

The goal of the actual study is to evaluate the results of the anti-TB treatment and to identify the risk factors associated with the social background of the detainees in a prison hospital. The present article is limiting to present data on the evaluation of the anti-TB treatment.

METHODS
Our research was carried out by using data recorded in the Colibași Prison Hospital which is a medical unit belonging to the National Penitentiary Administration and located in Mioveni Town (in Argeș District). The Colibași Prison Hospital is placed within the Colibași High Security Prison, and it is organised by three hospital departments with different profiles: TB, chronic diseases and dermatovenerology. Our study was performed within the TB department which has 125 beds only for male patients.
The study group consisted in patients diagnosed with pulmon-ary and/or extra-pulmonary TB (260 patients in total, for the period 2006-2009). According to the National TB Control Program for 2007–2011, detainees in prisons and other correction institutions are groups of population vulnerable to TB, and in this regard, the identification of TB suspects is done intensively and actively during the periodical clinical controls, followed by an evaluation using the bacteriological examination of sputum for identification of Koch bacillus and X-ray examination.

**RESULTS**

The study group consisted in 260 males. The individual ages varied from 18 to 75 years, and the average age was 36 years. The results obtained by us were in accordance with the international literature where the TB infection rate is related to age [3]. Although the relation between age and TB is not clearly described in the literature, our research revealed a specific pattern of the TB infection in the detainees groups having different ages; thus, in our study group most of cases (85) were recorded for patients aged 24 – 34 years, followed closely by the patients aged 35 – 44 years (79 cases). These two age categories represented 60% of the whole study group (see Figure 1).

Both, the role of TB identifying, monitoring and controlling activity in the prisons hospitals as well as the involvement of this type of hospital in implementing public health strategies, can be individualized directly and supported by the fact that the cases are carefully and professionally screened in these type of medical units.

Thus at the moment of imprisonment we detected 159 new cases. Without the screening process used in prison hospitals these cases may have passed undetected and untreated which could have lead to the TB spreading both among the other detainees (we call this cases “undetected and untreated infection”) and among the general population (when infected detainees are released from prison).

In our research the new detected cases coming from detention units were considered as representing infections acquired during the detention period. Out of the four major types of disease transmission (civilians – civilians, civilians - prison, prison - prison and prison - civilians) we identified that the latest three types (which can be considered and measured by including the detection phenomenon) have an important role in the TB incidence, prevalence and mortality rate analysis.

Consequently, we measured the risk associated with TB among detainees in prison. The risk of disease was high both among the individuals who had TB problems and among the individuals registered as new cases. Our data showed that 19.6% of cases had been diagnosed with TB before imprisonment. This rate could be an argument for the fact that, regardless of the imprisonment status, the detainees are at higher risk to develop an active form of TB in comparison with the rest of civilian population and that could explain the higher rate of TB incidence in prisons. Nevertheless our study revealed a higher risk of disease for the imprisoned individuals (50.7%). According to our data, the risk of infection was over 2.5 times higher among those living in prison; this aspect shows that transmission of the disease within prison contributes to a higher level of TB prevalence.

We performed an action of gathering information about the subject’s previous treatment, regardless the moment of diagnosis. This prerequisite activity (to know everything about previous treatments) is important, because the lack of this information may lead to useless superposition of the therapeutic act. In our research the study group was also observed from the perspective of two subgroups of members coming from similar urban or rural environment (see Figure 2).

In the literature, for TB infection, the urban – rural factor is described as having variations related to the demographic areas for investigation. Such an example is the research made in a rural district in Malawi and which revealed that the incidence of infection was actually higher among the urban population [4]. A possible explanation could be the high rate of HIV infection in towns. However, most of research data in literature comes from groups of civilian population and not from prison population; so, the high morbidity rates of TB recorded in urban areas may be amenable also to the lack of medical units in rural areas (what lead to weak accessibility and addressability of rural population to medical units). The weak addressability of rural population to medical units may be due to the ignorance or lack of information about characteristics of TB infections such as: TB is a severe communicable disease, but it is a disease which can be cured and for which treatment is available and free of charge for any individual.

To identify the relationship between the demographic characteristics and the compliance of detainees to treatment, our research has included also a comparison between the results of treatment applied for patients who were divided into the two residence areas: urban and rural (see Figure 3).

To be efficient, the anti-TB treatment should be prescribed and administrated accordingly with both specific medicines and efficient doses and periods of application.

The non-compliance to therapy was revealed as the major cause of unfavourable results such as: failure, recurrence or resistance treatment [5]. The reasons of low compliance to therapy are multiple, complex and unpredictable. TB healthcare services should identify and be addressed to ones of the factors which determine patients stop or discontinue applying their treatment.

In our study, the therapy procedures were surveyed and included direct observation of the drugs administration which help patients to finish and regularly intake
In a follow-up study investigating the clinical evolution of patients released from prison before the completion of their treatment, only 43% of them visited a physician at least one time for a medical control [7]. In another prison, the initial rate of 3% of visits to physician was increased to 23% after a educational intervention [8]. In our study, we did not monitor the patients after their releasing. An ideal situation of keeping TB under control is when the patients stay in the same prison for the whole period of treatment. This will allow a continuity of care under medical surveillance and would offer the best chance to cure the disease.

The goals of an efficient treatment of TB are the healing of the patient, the interruption of TB spreading to other people and prevention of developing the multi-drugs resistance. These goals are not achieved in many parts of the world even when the anti-TB medicines are available and accessible. The main reasons for this are: death of patients during the treatment, development of resistance to prescribed medicines. Non-compliance to treatment is considered a failure to the health system in finding solutions to decrease the natural tendency of individuals to give up treatment as soon as they feel better or when adverse reactions appear [9].

The outcomes of the treatment may serve as quality control indicators for the TB treatments delivered by the public health systems. The World Health Organization in cooperation with the European Division of the International Union against Tuberculosis and Lungs Disease (IUATLD) issued recommendations and standards for the evaluation of treatment results [10]. These standard categories have been defined in order to evaluate the risk of future recurrence and drug-resistance. Ideally, the results of a treatment for all patients should be monitored by the Epidemiologic Surveillance System. This would make possible the recognition and modification of system’s errors before the resisting cases and the incidence of disease increases. Out of the 260 subjects of our research, 173 patients (66.54%) completed the therapy under our surveillance. About 29.6% of them were moved to other units through the treatment period and we don’t know the final result of the treatment (see Fig. 4).

According to the 2005 World Health Organization Report on the worldwide TB control [11], the treatment success rates analyzed in 22 countries with high risk of TB have varied from 60% in Uganda to 93% in China with an average of 83%. Moreover, a study made in 2005, in South Ethiopia, by Shargie et. al. showed that the treatment success rate for all TB cases was of 49% [12].
Our research revealed that the result of the patients treated in Colibasi Prison Hospital may be considered satisfactory. The treatment success rate for all TB cases was of 65.38%. A higher treatment success rate could not have been reached because the transfer rate to other units of about 29.6%. The rate of giving up treatment was of 0.76% (including those out of the study) which is lower than 6.2% observed in the 22 countries with high risk of TB infection [13], and than 10% rate observed in Ethiopia [14]. According to some international studies [15], the patients that completed their treatments had a better awareness of the necessity of following up treatment stages compared to those which gave up the treatment. Some studies reveal that successful methods to reduce the drug abandon rates are: visits to the patient’s residence, patient’s motivation and higher sanitary education level. Our research reveals that success was due to a better medical surveillance within detention environment.

By our results, we can consider the necessity of reinforcing a non-invasive intervention and monitoring system within the civilian population in order to reduce the TB treatment abandonment rate. This rate varies from 0.1% to 9.1%, with an average of 1.5% in the countries with the high risk of TB infection [15]. The abandonment rate in our research was of 0.76% which is similar to the average. Due to the specific conditions and characteristics of detainees (as patients who need specific approaches for an efficient TB control) and due to the lack of national in-depth studies in this particular issue we have considered it was necessary to carry out this study which evaluated treatment result and identified risk factors of infections associated with the social background of detainees.

**DISCUSSIONS, CONCLUSIONS**

Due to the negative consequence of TB and to the evolution of its dynamics, this disease represents a national and international public health priority. Being considered as a disease appeared as a consequence of poverty, TB emerges mainly within social-economic vulnerable groups and the detention conditions increase the vulnerability of people to be infected with TB.

The health policies focused on strategies applicable to patients with high risk of infection should be based of available scientific evidence about this group of population. Concerning the compliance to the anti-TB treatment of detainees, a series of aspects should be taken into account in order to find efficient solutions that would imply all types of interventions to educate, to re-educate and to integrate the detainees. A multidimensional approach should be part of these policies and should involve and analyze the needs of the medical staff and also the patients’ special needs.

The prison hospitals represent instruments of society which provide individual health of detainees and also represent the liaison between the specific environment of prison and society, thus contributing to the insurance of public health.

**References:**