

## MORBIDITY BY TUBERCULOSIS IN THE JIU VALLEY: RELATION WITH DIAGNOSTIC PRACTICE AND THE IMPACT ON THERAPEUTIC RESULTS

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### Abstract

**Background and aim.** In the last two and a half decades the dynamics of tuberculosis has been modelled by social and economic conditions, with consequences on the life style, and effects on the onset and evolution of the disease. The Jiu Valley is an area with social problems: mining, mines closing down and ceasing activity, poverty. We looked for a relationship between changes of life style in the Jiu Valley and the dynamics of tuberculosis.

**Methods.** We studied 528 patients who asked for medical services in different hospitals in the Jiu Valley between 2010-2013. We structurally characterized this group, we identified the characteristics of life style, and we assessed the health state, in particular the relation with tuberculosis.

**Results.** We found out that the quality of life was influenced by the health state, especially by tuberculous disease. Quality of life was influenced by the life style, professional factors and their long term consequences. The study evidenced a strong relationship between apparently very different factors such as life style, professional factors on one side and those characterizing tuberculosis.

**Conclusions.** We report the first detailed epidemiological data on tuberculosis in an economically poor area, the Jiu Valley.

**Keywords:** tuberculosis, professional factors, tobacco dependence, alcoholism, life style

### Introduction

Tuberculosis is a well known infectious disease, determined also by other factors such as life style. The diagnosis and treatment play also an important role [1,2,3]. From this point of view the geographical area called the Jiu Valley represents an excellent example. A general look on the profile of the population shows that we deal with a population concentrated in human settlements considered as towns but with a life connected to a mono economy related to coal exploitation. Along the last three decades the quality of life of this population knew a lot of oscillations

which found a particular expression in daily life style. We consider that this will influence globally the morbidity of the populations and in particular tuberculosis [4,5,6].

In the following we shall try to prove that the social and economic conditions of life in the Jiu Valley have a real impact on the morbidity by tuberculosis and as a next step we shall try to propose some measures in order to improve the situation [7,8,9].

### Materials and methods

We studied 528 patients followed up between 2010-2013 as a result of their relation with the health system. These patients originated from six towns with a very different population in what concerns the number of inhabitants with the ratio varying from one to six [10,11].

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The communities where the patients were diagnosed and the sample size in each community are displayed in Table I.

The year of the diagnosis is displayed in table II. According to the early dynamics of these numbers we ascertain a diminution, but we cannot say whether we deal with an evolution expressing the dynamics of the disease or the phenomenon of addressability to a specific medical center.

Another explanation could be represented by the numerous economical distortions which changed in the last years both by the share of population but have altered also the existence of social institutions like hospitals which disappeared or diminished considerably their activity [12,13,14].

The analysis of gender distribution shows us the predominance of males. A greater vulnerability to tuberculosis is easy to explain by the work conditions of the male diggers characterized by exposure to numerous noxious wastes and by a life style strongly characterized by cigarette smoking and alcoholism.

Gender distribution is displayed in table III.

The analysis of the professional present/past of the studied group showed us a precarious social status of many of these patients, most of them being unemployed.

Data are displayed in table IV.

If we look at the distribution according to the level of training we see that most of them studied according to the necessities of their job (see table V).

The analysis concerning the age groups which had health problems related to tuberculosis showed us three peaks registered in the following age groups 31-40 years, 41-50 years, 51-60 years. That means that these persons were ill exactly in the period when a miner is very productive. This phenomenon determined a lot of costs for medical treatment and for temporary lack of working capacity. The

vulnerability of these patients is equally expressed by the pulmonary location of tuberculosis (87.31%). Of course associated conditions such as cold, moisture and constant inhalation of dust have contributed to this situation.

In table VI we show the anatomical segment involved by tuberculosis.

The 67 patients with extrapulmonary tuberculosis (i.e. 22.69%) certainly represent a minority, a fact confirmed by data in literature.

Figure 1 shows the ratio between pulmonary and extrapulmonary tuberculosis.

To these vulnerabilities we must add the toxic effect of tobacco and the excessive consumption of alcohol but what is surprising is that the number of MDR cases is not high. We discovered these cases only after having used methods of molecular biology currently performed only in special laboratories.

Almost ¼ of these patients had associated diseases, situation which is of great concern because this pathology was present into relatively young people (126 patients under the age of 60 and only 86 patients over the age of 60)

The phenomenon of cigarettes smoking [4] and alcoholism has the following dimensions: 70.83% are smokers and 43.18% recognized excessive consumption of alcohol. It is possible that the real percentage of alcohol consumption is higher because we believe that a number of patients did not admit to excessive alcohol drinking (see table VII) [15,16].

The studied patients received services of conventional radiology. A very small number had access to computed tomography.

In order to establish the etiology a conventional bacteriologic exam was recommended. In selected cases molecular biology was recommended [2]. These later results will be studied separately.

**Table I.** Geographical distribution of patients.

Current number	Town	Number of inhabitants	Number of investigated patients	
			Nr.	%
1	Aninoasa	4360	20	0.46
2	Lupeni	23390	115	0.49
3	Petrila	22692	91	0.40
4	Petrosani	37160	152	0.41
5	Uricani	8972	40	0.45
6	Vulcan	24160	107	0.44
7	Others		3	

**Table II.** Distribution of patients according to the year of study.

Year of study	2010	2011	2012	2013
Number of patients	189 (35.80%)	124 (23.48%)	108 (20.45%)	107 (20.27%)
Total of patients	528			

**Table III.** Gender distribution.

<b>Number of patients</b>	<b>528</b>
<b>Males</b>	415 (78.60%)
<b>Females</b>	113 (21.40%)

**Table IV.** Distribution of patients according to the working place and their professional level.

<b>Place of work</b>	<b>Mining</b>		<b>Other working places</b>						
	<b>Undergorund</b>	<b>Surface</b>	<b>Child</b>	<b>Pupil</b>	<b>Student</b>	<b>No job</b>	<b>Unemployed</b>	<b>Retired</b>	<b>Other job</b>
<b>Number of patients</b>	72	5	6	22	9	121	7	173	113
<b>Percentage [%]</b>	13.64	0.95	1.14	4.17	1.70	22.92	1.33	32.77	21.40

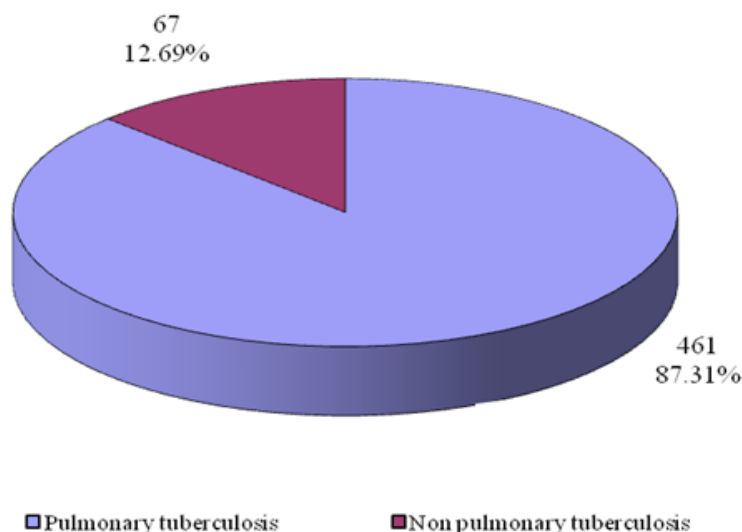
**Table V.** Distribution of patients according to their training level.

<b>Studies</b>	<b>No studies</b>	<b>Primary school</b>	<b>Secondary school</b>	<b>Professional school</b>	<b>High-school</b>	<b>Post secondary education</b>	<b>University</b>
<b>Number of patients</b>	7	35	84	218	154	5	25
<b>Percentage[%]</b>	1.33	6.63	15.91	41.29	29.17	0.95	4.73

**Table VI.** Distribution of patients according to the location of tuberculosis.

<b>Diagnosis</b>	<b>Pulmonary TB</b>	<b>Pleuritis</b>	<b>Ganglionary TB</b>	<b>Renal TB</b>	<b>Spondilosis</b>	<b>Bone TB</b>	<b>Intestinal TB</b>	<b>Genito-urinary TB</b>	<b>Peritoneal TB</b>	<b>Bronchial TB</b>	<b>Intracerebral tuberculomas</b>	<b>Emphizema</b>	<b>Peritonitis well documented showing a specific infection</b>	<b>Pericarditis</b>
<b>Number of patients</b>	461	47	7	2	2	1	1	1	1	1	1	1	1	1
<b>Percentage [%]</b>	87.31	8.90	1.33	0.38	0.38	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19

*Distribution of patients according to the localization/diagnosis of tuberculosis*



**Figure 1.** Distribution of patients according to the localization/diagnosis of tuberculosis.

**Table VII.** Distribution of patients according to the exposure to factors.

Dust/Risk factors	Smoking	Alcohol	Coffee
Number of patients	374	228	404
Percentage [%]	70.83	43.18	76.52

## Discussion

This study was carried out on a group of population living in a small area in locations considered towns but where life habits are similar to those of villages. Their professional status emerges from a mono economy. This population knew in the last two and half decades a number of changes, some of them of convulsive character and even with changes of professional profile. If initially this population worked mainly in the underground, in time they were obliged to accept the closure of many mines without reasonable alternatives for those who remained unemployed. Strange effects were registered in the life of this population. Initially it was a population relatively stable with a professional training according to the needs of mining. An explosion of unemployment was registered and social degradation such as alcoholism, and high tobacco consumption were registered while exposure to dust remained similar because there were no changes in the working conditions.

All these events decreased the quality of health

of this population and exposed it to the risk of catching a disease like tuberculosis. As a consequence more and more people of the region asked for medical services being more and more ill. We established a clear, statistically proved relation between hard smoking and tuberculosis in this population [17,18,19]. Some measures of medical adjustment appeared as imperative [20,21].

## Conclusions

The population of the the Jiu Valley has known events which substantially modified their life style and relation with work.

The greatest majority of the analyzed phenomenon were negative and were characterized by distortion of behavior, proliferation of a bad life style and an increased rate of illness.

In this context the medical units of the region have the mission to correct these evolutions and implement prophylactic measures.

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