Curierul medical, December 2016, Vol. 59, No 6

Impact of primary health care sector in the detection of tuberculosis on the model of Chisinau city

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Abstract

Background: Tuberculosis detection represents the major challenge in actual health care system, recognised in the Republic of Moldova and worldwide.

Material and methods: 101 pulmonary TB patients diagnosed in the period 1.1.2015-31.12.2015 in Chisinau were enrolled and distributed into two groups: the 1st group consisted of 73 patients with pulmonary TB detected in the frame of primary health care sector by general practitioners as symptomatic patients, and the 2nd group consisted of 28 patients with pulmonary TB detected by general practitioners by active way of screening.

Results: Patients from both groups were enrolled in a similar proportion according to the demographic characteristics (urban/rural residency, civil and educational status). Two thirds of both groups were uninsured, but the economic state was lower in the group of patients detected as symptomatic cases. Chronic alcoholism, drug use, history of imprisonment, migration, comorbidities were established in a similar number of cases from both groups. Despite the fact that high risk groups (TB contacts and HIV infected individuals) must be screened actively, their rate is statistically higher in the group detected by passive way. Smear positive results, extensive pulmonary infiltrates and lung parenchyma destructions predominated in the group detected by passive way. The rate of patients that successfully finished the treatment was similar in both groups, but deaths were registered only in the group detected by passive way.

Conclusions: The Republic of Moldova registers a continuous decrease of epidemiological TB indices due to the reduction of high risk groups designed to be investigated and the insufficient use of active screening.

Key words: tuberculosis, primary health care sector, risk groups.

Introduction

Tuberculosis (TB) represents a major threat to public health worldwide. The internationally approved strategy in control of TB, defined as End TB Strategy combines health promotion, disease prevention, case detection and patient management at the first encounter [2, 9, 12]. In the countries of Eastern Europe, Baltic States and the Commonwealth of Independent States (CIS) the diagnosis and treatment are performed in the specialized TB services. TB control system from those countries follows a three-tiered structure, incorporated at the national, regional and district level. The system of national TB control services consists of a network of TB facilities and health care institutions. However, for the successful disease control, entire health care sector must participate in TB control practices [11]. Early detection and referral for out-patients treatment represent the frontline where health care providers are involved, in a way reducing the burden of TB at the community level. Primary health care providers (PHCP) are health workers: physicians-general practitioners (GPs), nurses, auxiliaries and community workers who serve frontline providers, responding to the health needs of the community [7]. PHCP are the first to meet a TB patient, before the diagnosis is establlished [6]. Those providers represent the level where early detection must be performed and the efficacy of TB control activities has bigger impact (considering that a person with an undiagnosed active TB will infect on average 10-15 other people per year). Specific roles of PHCP differ according to regional or national guidelines, but they must accomplish the following functions established by the WHO Guide on TB Control for Primary Health Care Providers for countries localized in the WHO European Region with high and intermediate TB burden: 1. Suspect the disease in patients with symptoms suggestive of TB; 2. Ensure collection of sputum for microbiological examination for acid-fast bacilli from the patients with productive cough lasting more than 3 weeks; 3. Send the collected sputum to diagnostic laboratory for identifying acid-fast bacilli; 4. Order to perform chest X-ray examination of suspected patients; 5. Refer suspect individual to the specialized services for diagnosis and treatment; 6. Communicate to patients that the disease is curable and emphasize the importance of a regular and complete treatment; 7. Communicate with specialized organizations about the patients referred for diagnosis and treatment; 8. Perform screening of close TB contacts; 9. Educate general community about the signs and symptoms of TB; 10. Provide directly observed therapy till completion during the continuation phase; 11. Report complications, drug side effects, default of specific treatment to TB services; 12. Complete administrative forms and send them to the TB services; 13. Monitor high risk groups according to the national recommendations; 13. Perform BCG vaccination and tuberculin skin testation of children-closed contacts with TB patient [7]. Some specific recommendations for Moldovan PHCP were included in the national guide for "Tuberculosis Control at the Primary Health Care Level" : 1. Ensure the chemopreventive treatment of contacts from 0-18 years old and HIV infected contacts; 2. Identify indi-

viduals at high TB risk according to the national guideline to perform examination (chest X-ray examination in adults and tuberculin skin testation in children); 3. Perform collaborative activities with local NGOs in disease prevention; 4. Support TB patients in association with the community, public local authorities and governmental institutions [6]. The Moldovan guide emphasizes some regulations of active screening to be performed by GPs from PHC sector: 1. Perform clinical examination of high risk groups of adults and children every 6 months; 2. Order a chest X-ray and microscopic examination of the sputum of individuals with suggestive signs and symptoms; 3. Order a chest X-ray in adults and tuberculin skin test in children from high risk groups at least one time in 12 months, even if there are no clinical signs suggestive for TB; 3. Perform the clinical examination annually to individuals included in the dangerous groups; 4. Perform a chest X-ray in patients from dangerous groups with suggestive signs and symptoms. 5. Perform a chest X-ray in individuals from contingency groups before the enrollment into the work field and one time per year. There are specific regulations that must be performed by PHCP in the frame of passive screening: 1. To identify and send the patients with suggestive signs and simptoms for microbiological examination for acid-fast-bacilli. 2. To send the patients to the pneumophtysiologist after performing the investigations and the non-specific treatment [6].

In the majority of countries of the Commonwealth of Independent States the vertically structured specialized TB care services are unsatisfactorily coordinated with the PHC system; however the activities of both sectors must be interdependent for a better TB control. In this context, it is important to underline that rapid progress in control of TB occurs only in health systems where TB activities are integrated in PHC, and TB case detection and management procedures are implemented in the frame of the entire population [8]. The major role of PHC providers in the Commonwealth of Independent States is to detect TB suspects and referring them for diagnosis and treatment to specialized organizations. The actual challenge represents the extending ambulatory TB treatment, and replacing the in-put (hospital based case) with out-put (ambulatory care), duty that will become even more important than the detection of new patients with active disease [5].

Primary health care providers (PHC) are important actors in TB control in the Republic of Moldova, because the majority of TB patients report their first visit to GPs due to suggestive clinical signs and symptoms [6]. As a rule, PHC is the first level where individuals, family and general community receive health care, being the most accessible and affordable care for the majority of people of our community. PHC performs the following activities: health education, promotion of proper nutrition, maternal and child care, immunization against major infectious diseases, prevention and control of endemic diseases, treatment of common diseases and provisions of essential drugs. For an optimal ongoing of activities, PHC must be sustained by the referral systems – hospitals and ambulatory specialized organizations, as well as by the civil society organizations [8]. One of the most important activities which must be performed by the PHCP is the good communication with patient and entire TB specialized service. It starts at the community level and represents the communication with patients with symptoms suggestive for active disease. PHCP will order to execute sputum smear investigations, molecular genetic assay – GeneXpert MTB/Rif (semi-quantitative, nested real-time polymerase chain reaction for detection of *Mycobacterium* DNA and rifampicin resistance mutations of the *rpoB* gene) and chest X-ray to all symptomatic patients. At this level, the consultation of TB specialist will be also required and the symptomatic patients will be referred to the TB services for further examinations. Within 2-3 days, if the investigations confirm active disease the pneumophtysiologist will start the specific treatment, diminishing the risk of TB transmission in the community [6].

The health system of the Republic of Moldova is organized around the principle of universal access to basic health services and equity in health services [3]. It is financed by the state and by citizens, through mandatory health insurance mechanism. The Ministry of Health is overseeing the health system, demonstrating the responsibility for the management of health services [10]. However, the financing of most health services lays on the National Health Insurance Company. In the Republic of Moldova, PHC is provided by family medicine centers, primary care centers and health centers. Actually, our country registers significant success in reorientering the health system towards primary care facilities. In rural localities primary care services are provided by the family doctor offices and health centers, but in urban areas they are performed by the big family centers – Territorial Medical Associations (TMA), former "policlinics". The primary health care level consists of 37 family medicine centers in the Republic of Moldova, including 216 health centers, 556 family doctors offices and 359 health offices. There are also 46 autonomous health centres, covering 71 family doctors offices and 44 health offices. In Chisinau, there are 5 TMA, covering 12 family medicine centers, five consultative and diagnostic centers. Family medicine centers and consultative centers provide family medicine and specialized outpatients services. A health centre service has at least 4500 inhabitants and three family doctors. One family doctor services a population of 900-3000 inhabitants, but the official norm of patients per a family doctor is 1500 patients [3]. PHC demonstrate an important role in providing preventive and health promotion services. The WHO study "Evaluation of the structure and provision of PHC in the RM" determined that the number of patients referred to medical specialists in our country is very high [10]. Considering this fact, the resources of PHC are not efficiently used, avoiding them through ambulance services that increase the risk of hospi-

talization. There are multiple causes for avoiding the PHC facilities in the RM: long waiting times, limited and unsatisfactory quality of provided services, in this way contributing to a higher addressing of the population the specialists and hospital services. The current management of the patient starts with the first consult of GP, who decides if a further referral is needed to a specialized ambulatory clinic or a district hospital. The next step represents the decision of the specialist to investigate, or to admit the patient into the specialized hospital or to refer the patient back to the family doctor, who is responsible for monitoring the accomplishment of the recommendations. In urban areas, people call for emergency health care – ambulances, being directly transported to hospitals. There are patients, for example with active TB, who are directly self-referring to tertiary – hospital facilities [10]. Considering exposed data it can be concluded the major role belongs to PHCP in TB control activities at the community level.

So, the aim of the study was the assessment of the major epidemiological indices dynamics in the period 2013-2015 and the impact of primary health care sector on the detection of pulmonary tuberculosis cases and treartment outcome in 2015, in Chisinau. Established objectives were: 1. Assessment of dynamics of epidemiological indices in Chisinau, during 2011-2015. 2. Assessment of general, socioeconomical and epidemiological risk factors of pulmonary TB patients detected by GPs according to the way of detection; 3. Evaluation of case-management, clinical aspects, radiological aspects and treartment outcome of pulmonary TB detected by GPs according to the way (passive and active) of detection.

Material and methods

It was performed a retrospective selective, descriptive study targeting social, demographic and economic peculiarities of 101 patients with pulmonary tuberculosis diagnosed in Chisinau city in the period of 01.01.2015-31.1201.2015. The informational system for monitoring and evaluation of tuberculosis cases (SIME TB) was used for the patients' selection. Data were extracted from the statistic templates within the frame of tuberculosis case registration – F089/1-e "Declaration about patient's established diagnosis of new case/relapse of active tuberculosis and restart of the treatment and its outcomes" and F090 "Declaration and evidence template of tuberculosis cases". Included criteria were: age > 15 years old, new case of pulmonary tuberculosis (patient never treated for TB, or has taken anti-TB drugs less than one month.), established through positive GeneXpert MTB/RIF assay, and signed informed consent. The investigational schedule included demographic, social and epidemiological data: sex (male/female ratio), age (distribution in age groups according to the WHO recommendations), (urban/rural residence, country of patient's origin), educational level, socio-economic status (employed, unemployed, retired, disabled, student), health insurance status (uninsured, insured), migrational and detention history, presence of high risk (close contact, comorbidities: HIV-infection, psychiatric diseases, immune suppressive treatment), type of infectious cluster, health care seeking behavior, way of the patient's detection. All selected patients were diagnosed and managed according to the National Clinical Protocol 123 "Tuberculosis in adults". Enrolled patients were distributed in two groups: the 1st group constituted 73 patients with pulmonary TB detected in the frame of primary health care sector by general practitioners as symptomatic patients and the 2nd group constituted 28 patients with pulmonary TB detected by general practitioners by active way of screening. Statistic assessment was carried out using the quantitative and qualitative research methods. Statistical survey was performed using Microsoft Excel XP soft.

Results and discussion

According to the published data by the Moldovan National Centre for Management in Health during the period 2011-2015 it was registered an important decline (with 23/100.000) of the new case incidence in Chisinau city from 76/100.000 in 2011 to 53,9/100.000 population in 2015. The total number of new pulmonary TB cases decreased from 602 in 2011 to 435 in 2015 [1]. By PHCP were detected 213 (48,96%) new pulmonary TB cases in 2015. In the frame of passive way of screening GPs detected 129 (60,5%) patients and through the active screening 484 (39,5%) cases. From the total number of 213 cases 101 (47,4%) were confirmed by the positive GeneXpert MTB/RIF assay.

Demographic distribution established that in urban area of Chisinau city the new case incidence decreased (with 18,4/100.000 population) from 67,5/100.000 (487 patients) in 2011 to 49,1/100.000 (360 patients) in 2015. In rural area the new case incidence decreased more evidently from 162,0/100.000 (115 patients) to 75/100.000 (75 patients), thus showing a sharp downward trend (60,4/100.000 population). In this context, it is important to enumerate the surrounding villages included in rural area of Chisinau city in alphabetic order: Bacioi, Bic, Bubuieci, Budesti, Cheltuitori, Ciorescu, Codru, Colonita, Condtrita, Cricova, Cruzesti, Dobrogea, Dumbrava, Durlesti, Fauresti, Frumusica, Ghidighici, Goian, Gratiesti, Hulboaca, Humulesti, Revaca, Stauceni, Strainsteni, Singera, Tohatin, Truseni, Vadul lui Voda, Vatra, Vaduleni.

Multiple causes were involved in that fast downward trend: 1. insufficient rate of active screening investigations of high risks groups (close contacts with infectious TB sources, HIV infected individuals, patients with pulmonary sequels, patients with immunesuppressive therapy such as corticosteroids, specialized treatment for rheumatoid arthritis or Chron's disease, persons with psychiatric diseases; 2. Low addressability of patients to PHCP and

high rate of inaccessible patients [10]. Data are shown in the table 1.

Sex distribution established the predominance of men in comparision with women in both groups 48 (65.7%) in the 1st group and 22 (78.5%) cases in the 2nd group, with male/female ratio=1,92/1 in the 1st group and 3,67/1 in the 2nd group. Repartition of the patients into age groups according to the WHO recommendations, identified that the largest represented was 35-44 years old age group: 25 (34.2%) patients in the 1st group and 8 (28.6%) cases in the 2nd group, followed by the 45-54 years group 7 (25.0%) case in the 2nd group and 25-34 year group 18 (24.6%) patients in the 1st group. While redistributing patients in two age groups (young and >45years) it was established the predominance of younger cases (55 (75.3%)) in the 1st group comparing with 17 (60.2%) patients in the 2nd group, and older patients in the 2nd group 11 (39.3%) comparing with 18 (24.6%) in the 1st group without achieving statistical threshold. So, stratifying patients according to the biological characteristics it was argued that men and older individuals (>45years) are diagnosed more frequently by the screening methods and young persons, as well as women are more frequently detected and diagnosed through passive way of screening as symptomatic patients (table 1).

Table 1

Distribution of patients according to the demographic factors

Demographic factors		SG, n=73	CG, n=28	P value
		n (%)	n (%)	
Sex	Men	48 (65,7)	22 (78,5)	>0,05
	Women	25 (34,3)	6 (21,4)	>0,05
Young groups	18-24 years	12 (16,4)	3 (10,7)	>0,05
	25 – 34 years	18 (24,6)	6 (21,4)	>0,05
	35-44 years	25 (34,2)	8 (28,6)	>0,05
Older groups	45-54 years	13 (17,8)	7 (25,0)	>0,05
	>55years	5 (6,9)	4 (14,3)	>0,05
Residence	Urban	56 (76,7)	23 (82,1)	>0,05
	Rural	17 (23,4)	5 (17,9)	>0,05

Demographic distribution identified that all the enrolled patients were by origin from the Republic of Moldova, and in both groups there was a similar proportion of individuals from the urban and rural areas. Two thirds of patients were from urban area, and one third – from rural area. No homeless patients were identified among the selected cases. By distributing the patients according to the educational level, it was determined that individuals with low level of school education (primary and incomplete secondary school) were identified in a similar proportion in the 1st group and in the 2nd group: 21 (28.8%) and 7 (25%) cases, respectively. By distributing the patients according to the socioeconomic status, it was established that the rate of patients with economic stability was higher in the 2nd than in the 1st group. So, one third of patients was employed in the 2nd group 10 (35.7%) patients comparing with 16 (21.9%) cases - in the 1st group. One half of both groups, (42 (57.53%) patients in 1st group and 13 (46.4%) patients in 2nd group) were unemployed. The totality of patients with low financial income (unemployed, retired and students) was in a similar proportion in both groups: 57 (78.1%) in the 1st group *vs* 19 (67.9%) cases in the 2nd group. Assessing the civil status it was identified the same rate of married persons in both groups: the 1st group (46 (63.1%) cases and 13 (46.4%) cases in the 2nd group. Patients living under the poverty line, with the income less than the minimum consumer basket were more frequently identified in the 1st group than in the 2nd group. Harmful social habits such as chronic alcoholism and drug use, as well as the history of imprisonment and migration during last year were identified in a small number of cases, without statistical differences between the groups. Epidemiological risk factor, such as a close contact and being a member of the family TB cluster statistically prevailed in the 1st group 17 (23,3%) *vs*. the 2nd group 2 (7.1%) cases, although the active way of detection is oriented especially to close contacts. So, it was identified the unsatisfactory use of active way of TB screening in infectious clusters (table 2).

Table 2

Distribution of patients according to the socio-economic factors

Demographic factors		SG, n=73	CG, n=28	P value
		n (%)	n (%)	
Educational status	Low (primary/incomplete secondary)	21 (28,8)	7 (25,0)	>0,05
	Secondary	30 (41,09)	14 (50,0)	>0,05
	Professional	14 (19,2)	4 (14,3)	>0,05
	Superior	8 (10, 9)	1 (3,5)	>0,05
Economical status	Employed	16 (21,92)	10 (35,7)	>0,05
	Unemployed	42 (57,53)	13 (46,4)	>0,05
	Disabled	1 (1,37)	0	>0,05
	Student	8 (10,9)	2 (7,1)	>0,05
	Retired	6 (8,2)	4 (14,3)	>0,05
Social factors	Under minimum standard life	27 (36,9)	14 (50,0)	>0,05
	Migration	10 (13,67)	2 (7,1)	>0,05
	Alcohol abuse	2 (2,74)	1 (3,5)	>0,05
	Drug use	1 (1,37)	1 (3,5)	>0,05
	History of imprisonment	1 (1,37)	2 (7,1)	>0,05
	Family cluster of TB	17 (23,29)	2 (7,1)	<0,05

The rate of health uninsured patients was similar in both groups, as well as the rate of patients with comorbidities. So, two thirds of both groups were uninsured. One fifth of both groups were comorbid patients (figure 1). Delayed diagnosis due to the insidious onset of the disease

lasting more than 60 days statistically prevailed in the 1st group, 64 (87.7%) *vs.* 8 (28.6%) cases in the 2nd group. Summing up all patients that form high risk groups it was established that persons with risk for TB predominated in the 1st group 27 (36.9%) *vs.* 6 (21.1%) patients from the 2nd group. So, it can be concluded that passive way of screening contributes to delayed detection, diagnosis and treatment onset. On the other hand the low rate of patients from high risk groups detected through the active way of screening demonstrates poor disease control performed by PHCP in the frame of high risk groups (table 3).

Table 3

Case-management of TB patients and high risk groups

Characteristics		SG, n=73	CG, n=28	P value
		n (%)	n (%)	
Case management	Lack of health insurance	47 (64,4)	17 (60,7)	>0,05
	Associated diseases	17 (22,3)	5 (17,6)	>0,05
	Late detected (>60 days)	64 (87,67)	8 (28,57)	<0,001
	High risk groups	27 (36,9)	6 (21,4)	<0,05
High risk groups		**SG, n=27 n(%)**	**CG, n=6 n(%)**	
	HIV coinfected	8 (29,6)	2 (7,14)	<0,001
	TB-contact	17 (62,9)	2 (7,14)	<0,001
	Immune suppressive treatment	1 (3,7)	2 (7,14)	>0,05
	Psychiatric disease	1 (3,7)	0	>0,05

High risk groups were designed to be examined compulsorily annually and free of charge. Despite this recommendation, the rate of such individuals was statistically higher in the 1st group, 27 (36.9%) cases compared to the 2nd group – 6 (21.4%) cases. Being one of subgroups, HIV-infected individuals were more frequently in the 1st group 8 (29.6%) comparing with the 2nd group 2 (7.14%) cases. More evidently, TB contacts were more frequently identified in the 1st group - 17 (62.9%) cases comparing with the 2nd group of 2 (7.14%) patients. There were no differences in the rate of patients with immune suppressive treatment, and psychiatric diseases identified in both groups.

When assessing the laboratory features of the enrolled new pulmonary TB cases, it was identified that one half of patients was microscopic positive for acid-fast-bacilli in the 1st group and only one third - in the 2nd group. The same rate was identified in the repartition of patients according to the positive bacteriological results (culture on solid Lowenstein-Jensen ether liquid MGIT BACTEC). The sensibility to the rifampicine through GeneXpert MTB/Rif assay was established more frequently in the 1st group than in the 2nd group, without achieving the statistical threshold (table 3).

Assessing radiological features of investigated patients it was established a high degree of difference between the

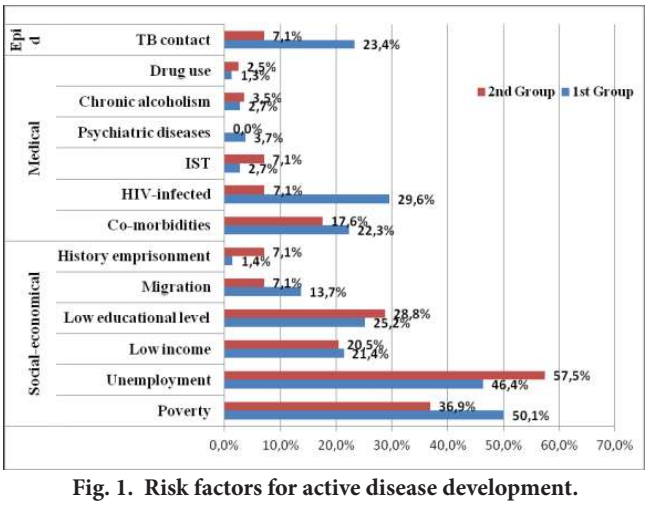

Fig. 1. Risk factors for active disease development.

Note: IST-immune suppressive treatment.

groups regarding the extensibility of infiltrative processes. More frequently were patients with 1 lung involved in the 2nd group, 26 (92.8%), and with both lungs affected in the 1st group, 63 (86,3%) cases. Lung infiltrates were complicated with destructions in two thirds of the 1st group, 49 (67,1%), and only in a couple of patients from the 2nd group (table 4). This fact is due to the late detection of new TB cases in the 1st group and earlier detection in the 2nd group.

Table 4

Microbiological, radiological features and treatment outcome

Characteristics		SG, n=73	CG, n=28	P value
		n (%)	n (%)	
Microbiological	Microscopic positive	38 (52.01)	10 (35,7)	<0,001
	Culture positive	40 (54,8)	11 (39,3)	>0,05
	GeneXpert MTB/Rif sensible	47 (64,4)	20 (71,4)	>0,05
	GeneXpert MTB/Rif resistant	26 (35,6)	8 (28,6)	>0,05
Radiological	1 lung involved	10 (13,7)	26 (92,8)	<0,001
	2 lungs involved	63 (86,3)	2 (7,14)	<0,001
	Lung destructions	49 (67,1)	2 (7,14)	<0,001
	Infiltrative TB	67 (91,8)	25 (89,2)	>0,05
	Disseminated TB	6 (8,2)	3 (10,7)	>0,05
Treatment outcome	Healed	30 (41,09)	10 (35,7)	>0,05
	Treatment completed	8 (10,9)	5 (17,85)	>0,05
	Dead	3 (4,1)	0	>0,05
	Continuing TB treatment (individualized regimen)	0	13 (46,24)	
	Continuing DOTS plus treatment	16 (21,9)	5 (17,8)	>0,05
	Hospitalized during intensive phase	73 (100)	28 (100)	>0,05

All patients were treated during intensive phase in the Chisinau Municipal Hospital of Pneumophtysiology. By

assessing the final treatment outcome, it was identified a similar rate of healed patients treated with standard regimen for new TB case in both groups, 30 (41.1%) cases in the 1st group and 10 (35.7%) cases in the 2nd group. As well as, completed the specific treatment a similar proportion of patients in both groups, 8 (10.9%) cases in the 1st group comparing with 5 (17.85%) cases in the 2nd group. Died only 3 (4.1%) patients from the 1st group, comparing with no registered deaths in the 2nd group. Almost one half of patients (13 (46.24%) from the 2nd group are still continuing an individualized regimen. A similar rate of patients from both groups is performing the treatment for MDR-TB.

Conclusions

In 2015, in Chisinau, primary health care providers identified only 101 new pulmonary TB cases with positive GeneXpert MTB/RIF assay from a total number of 213 cases, 78 cases as symptomatic patients and only 23 patients by active screening.

By distributing patients according to the sex, it was identified the predominance of men in comparison with women in both groups, but the male/female ratio was 2 times higher in the group detected by active screening.

All patients were by origin from the Republic of Moldova. No homelessness was registred. Two thirds of patients were from urban area of Chisinau. Data confirm the inaccessible primary health care for immigrants, homeless and low accessibility for rural population.

Educational and civil status was similar in both groups of selected patients.

Economic status was higher in the group detected by active screening. On the other hand the unemployment and rate of patients living under the poverty line were higher in the group of patients detected as symptomatic cases.

Two thirds of patients from both groups were uninsured, demonstrating their low accessibility to health care.

Chronic alcoholism, drug use, history of imprisonment, migration were established in a small number of cases from both groups. Co-morbidities were identified more frequently in the symptomatic group of patients.

Close contact with infectious source, as well as HIV infection prevailed in the group detected as symptomatic, despite the fact that those patients might have been detected by active screening.

High statistical difference between groups was established comparing microbiological and radiological features. Positive bacillary state, extensive process and lung destruction were more frequent in the group of symptomatic patients.

The same rate of successfully finished the treatment in both groups contrasted with death rate registered only in the groups of symptomatic patients.

In overall, the Republic of Moldova registers a continuous decrease of epidemiological TB indices due to the reduction of high risk groups designed to be investigated and regretfully to insufficient use of active screening.

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