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E. Lesnic[1], S. Ciobanu[2], L. Todoriko[3], A. Malic[1]

[1] Nicolae Testemiţanu State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

[2] Institute of Phtysiopneumology «Chiril Draganiuc», Republic of Moldova

[3] HSEE of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine

Determinants of the loss to follow-up of the patients with tuberculosis and the role of the social support

Tuberculosis represents a major global health problem. The major social determinants of tuberculosis and poor disease outcome are social and economic inequalities, high level of migration, rapid urbanization.

Objective — to assess the major determinants of the lost to follow-up tuberculosis patients and the role of the social support.

Materials and methods. A retrospective selective, descriptive study was performed on the social, economic and epidemiological peculiarities, case-management, diagnosis, radiological aspects and microbiological characteristics of 272 lost to follow-up Moldovan patients with pulmonary tuberculosis of which 151 were interviewed.

Results and discussion. It was established that the most of the patients were men, young aged, in the economical vulnerable state, without social assistance and epidemiologicaly endangered. One third of the sample avoided primary health care units, addressed directly to the hospitals and were diagnosed with severe, microbiological positive and drug-resistant forms of tuberculosis. The patients required during the interview the social and financial support, but the poor accessibility of the social organizations, associated with a high proportion of those which will change their resident place endanger the treatment completion in one third of the sample.

Conclusions. After a national implementation of DOT strategy the poor treatment outcomes, increased due to standardized approach of the tuberculosis patient.

The most of the patients treated after loss to follow-up were men, in early and middle adulthood, economically vulnerable, without social protection and from the epidemiological endangered groups.

Patient's avoidance of the primary health care staff, direct addressing to the hospital with severe forms of tuberculosis, microbiological positive status were the characteristics that showed the importance of a high vigilance regarding high risks for therapeutic drop-up.

Key words

Tuberculosis, risk factors, loss to follow-up.

Tuberculosis represents a major global health problem [14]. In the Republic of Moldova (RM) 4211 tuberculosis cases were notified in 2015, 3608 were new cases, 85% of them were tested by rapid diagnostic methods, 95% had known HIV status, 90% had pulmonary tuberculosis and 64% were bacteriologically confirmed [1]. The national implementation of the WHO recommended DOT (Directly Observed Treatment) strategy contributed to the decreased treatment effectiveness (2010 — 52%, 2011 — 62%, 2012 — 62%, 2013 — 76%, 2014 — 75.8%) which is the lowest in the European region [1]. The low success rate was linked with the high rate of lost to follow-up patients: 2010 — 12.2%, 2011 — 10.7%, 2012 — 8.1%, 2013 — 81% and 2014 — 5.8% [1]. There is an important difference of the treatment success rate among cohorts types. In 2014 the treatment success rate in the drug-susceptible HIV-negative patients constituted 79%, HIV-positive patients 47% and in multidrug-resistant tuberculosis (MDR-TB) cohort 53% [1]. The major contribut-

ing factor of the treatment effectiveness represents the right combination of the drugs according to the susceptibility results [13]. For a better drug-resistance surveillance and early diagnosis rapid molecular test (GeneXpert MTB/Rif) is used starting with 2014 by 15 Moldovan Health Care specialized institutions offering a 45% sensibility [7]. However the conventional methods: Lowenstein Jenson and BACTEC cultures remain the golden standard for Mycobacterum tuberculosis complex detection due to the simplicity and low cost [16]. According to the WHO guidelines the treatment of rifampicin-resistant at GeneXpert MTB/Rif test or MDR-TB patients is performed with second-line drugs during the 24 months [17]. Low treatment adherence and high rate of lost to follow-up patients contributed to the development of a short conventional MDR-TB regimen lasting 9 months and showed promising results in MDR-TB patients with non-complicated tuberculosis (excluding extrapulmonary tuberculosis and pregnancy) [17].

The major social determinants of tuberculosis and poor disease outcome are social and economic inequalities, high level of migration, rapid urbanization. Such determinants determine the polarization of the public health interventions, poor housing, low environmental conditions, malnutrition, geographic and cultural barriers in access of the health care [1, 8, 9]. It was identified a strong association of social isolation, poverty, unhealthy nutrition and persistence of tuberculosis in extremely poor populations: gipsies, drug users, alcohol consumers, homeless people, migrants [4]. There are several risk factors that influence disease outome: a) the infection with resistant strains (is linked with the prevalence of MDR-TB patients in the community, high population density, urban residence, poor indoor ventilation and pollution); b) the patient's biological characteristics (male sex, phtysiogenic ages (early childhood, adolescence, early and late adulthood), patient's immune suppressed status: HIV infection, diabetes, cancer, silicosis, chronic respiratory diseases, gastrointestinal diseases, underweight, other immune suppressive conditions (chronic immune supressive treatment with corticosteroids, immune modulators and anti-neoplastic diseases), lack of BCG vaccination, harmful habits (tobacco smoking, alcohol abuse, illicit drug using); d) patient's low accessibility to tuberculosis screening methods and health care and poor treatment compliance [1].

According to the WHO estimations RM remains a high risk zone showing an inadequate concern regarding the social determinants of the health. In the actual globalizational process, the major risk factors involved in the disease epidemic state are: lack of social protection and medical insurance, geographic and economic barriers, cultural behaviour and stigma [16]. Only the complementarity of the primary health care and specialised sectors, and community/social support can ensure the maximum effectiveness of TB control actions. The aim of the study was to assess the determinants of tuberculosis patient's loss to follow up and the role of the social support.

Materials and methods

It was performed a retrospective selective, descriptive study on social, economic and epidemiological risk factors, case-management, diagnosis, radiological aspects and microbiological characteristics of 272 lost to follow up Moldovan patients with pulmonary tuberculosis. The inclusion criteria were: age > 18 years old, diagnosis of pulmonary tuberculosis, patient treated after a previous loss to follow-up in the period 01.01.2010—31.1201.2016, signed informed consent. The investigational schedule included demographic, social and epidemiological data: sex (male/female ratio), age (distribution in age groups), demographic characteristics (urban/rural residence), educational level, socio-economic status (employed, unemployed, retired, disabled, student), health insurance status, migration and detention history, close contact with an infectious source, co-morbidities (HIV-infection, diabetes, psychiatric diseases, immune suppressive treatment), health care seeking behavior, way of the patient's detection. All selected patients were diagnosed and managed according to the national clinical protocol.

For the assessment of patient's social requirements it was performed a pre-designed interview-schedule containing open-ended and close-ended questions, reflecting various aspects of the social state: civil status, number of the family members, patient's monthly income, stigma signs, his necessities for the social support, the nearest social supporting institution and its accessibility. The sample size was 151 interviewed patients, which were 55.51% cases of the selected group. They were informed about the purpose of the study, were assured about their confidentiality and anonymity and the informed consent was taken. Statistic analysis was carried out using the quantitative and qualitative research methods. Statistical survey was performed using Microsoft Excel XP soft.

Results and discussion

Clinical study established the predominance of male sex and a male/female ratio = 3.85/1. Repartition of the patients into three age groups, identified that the largest represented was 35—54 aged group, followed by the 18—34 years group (Fig. 1).

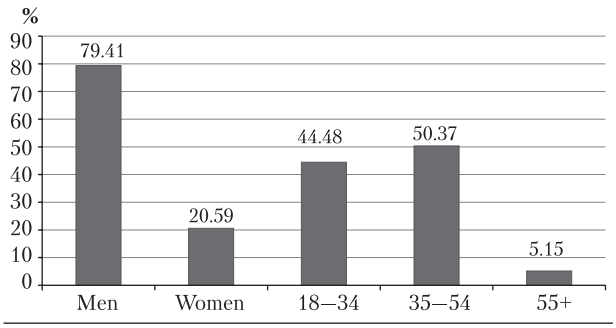

Fig. 1. **Distribution of the patients according to sex and age groups**

Note. 18—34 years group, 35—54 years group, 55 years old and more.

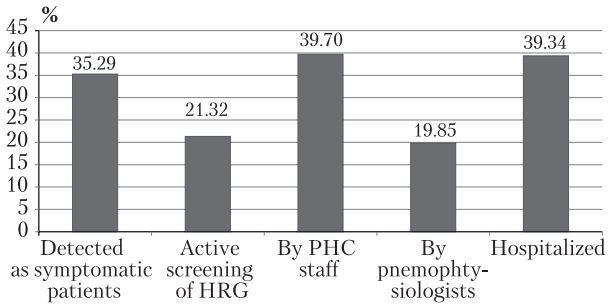

Fig. 2. **Distribution of the patients according to detection particularities**

Note. HRG — high risk groups, PHC — primary health care.

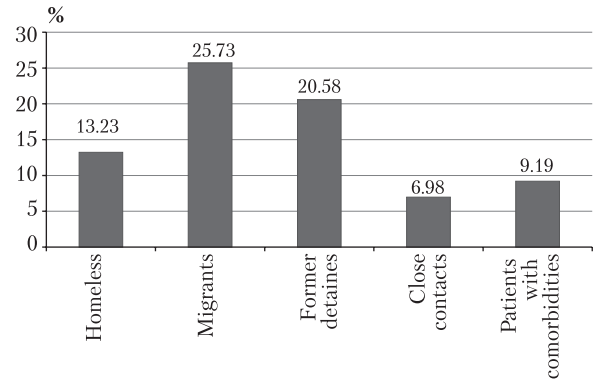

Fig. 3. **Distribution of the patients in high risk groups**

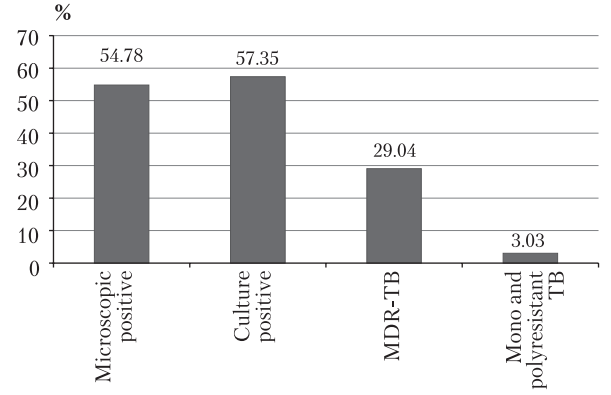

Fig. 4. **Distribution of the patients according to the microbiological features**

Studying detection case-management it was identified that general medical staff of the primary health care units was involved in the detection of the one third of the sample 108 (39.71 %), of which two thirds as symptomatic patients and one third during the screening of the high risk groups. Pulmonologists detected only every fifth patient: 54 (19.85 %) cases. A high number of patients, 107 (39.34 %), came to the specialized hospitals avoiding primary health care settings (Fig. 2).

Distributing patients in high risk groups for tuberculosis morbidity was identified that the highest rate represented those epidemiological endangered, such as persons with a history of migration in the last year and former detainees. They constituted one half of the sample. Close contacts with sick people were established in a low proportion due to the low quality of the cross-examination of the tuberculosis clusters. Patients with co-morbidities were in low proportion (every tenth), of which HIV infected were 25 (9.19 %), diabetes had 2 (0.73 %) and psychic disorders — 4 (1.47 %) cases. Alcohol abused or were chronic alcoholics 26 (9.56 %) cases, were active tobacco smokers 178 (65.44 %) and drug users 5 (1.84 %) patients (Fig. 3).

When assessing the laboratory features of the enrolled patients, it was identified that one half of the sample was microscopic positive for acid-fast-bacilli and had positive results for culture on solid Lowenstein-Jensen either liquid MGIT BACTEC media. Drug sensitivity testing identified that one third of the sample was multidrug-resistant and in a lower proportion were identified patients infected with mono- or poly-resistant strains (Fig. 4).

Distributing patients according, to the previous disease history, it was established that one half of the sample was treated with the standard regimen for new cases and one half received re-treatment regimen. Patients with a previous lost to follow-up were every fifth (Fig. 5).

Identifying the radiological forms it was established that pulmonary infiltrative tuberculosis prevailed in the selected sample, however severe types such as fibro-cavernous and disseminated forms were diagnosed in every fifth patient. When distributing patients according to the number of the affected lungs, it was established that both lungs were affected in two thirds of the sample and lung destruction was established in one half of the group. Associated extrapulmonary localizations were established in a limited proportion (Fig. 6).

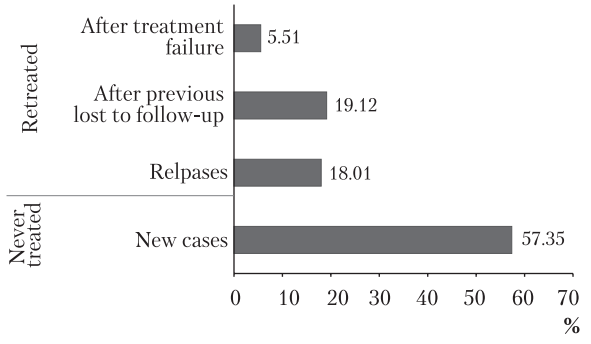

Fig. 5. **Distribution of the patients according to previous history of the tuberculosis treatment**

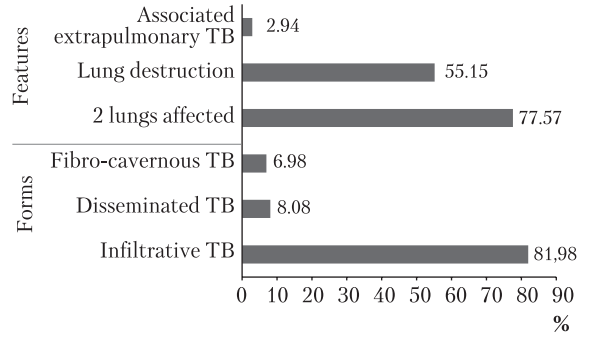

Fig. 6. **Distribution of the patients according to the radiological features of tuberculosis**

Fig. 7. **Distribution of the patients according to economic state**

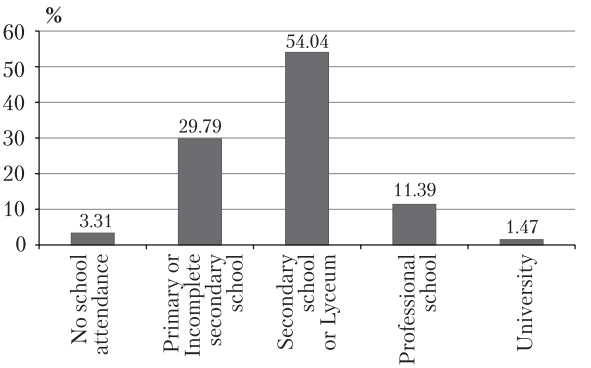

Fig. 8. **Distribution of the patients according to the educational level**

Distributing patients in groups according to the economic status, it was established that employed persons, contributing to the health budget by paying taxes, health insurance policy and social taxes were in a very low proportion. The low rate of disease disabled and retired patients demonstrated the low accessibility of social funds for tuberculosis patients. The majority of the sample was constituted from unemployed patients. Health insurance represents the major condition for accessing health care in the RM regardless the free of charge of tuberculosis case-management. Patients without insurance were in high proportion: 102 (86.03%) cases (Fig. 7).

Assessing the educational level, it was established that one half of the sample graduated secondary school or lyceum. However, every third patient had low level of education (primary or incomplete secondary) or even had no studies. Professional school or college graduated every tenth patient and the university level was established in a limited number of cases (Fig. 8).

When assessing the civil state, patients were distributed in groups: single state, which included unmarried, divorced and widows, and married or

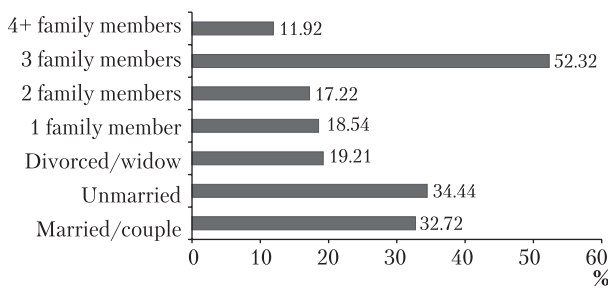

Fig. 9. **Distribution of the patients in civil groups and number of the family members**

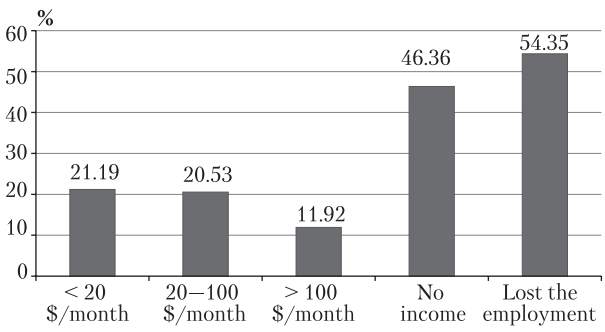

Fig. 10. **Distribution of the patients in economic groups**

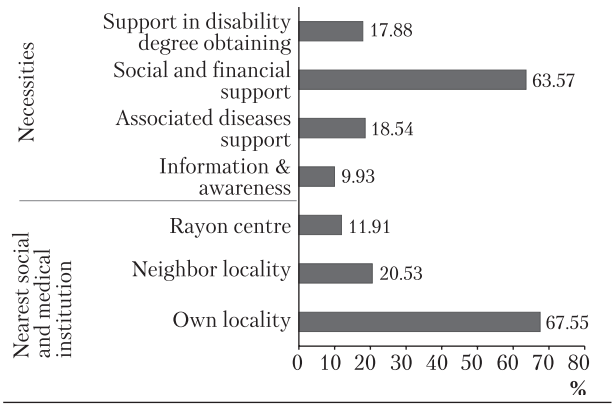

Fig. 11. **Distribution of the patients according to the accessibility of the social assistance and their necessities**

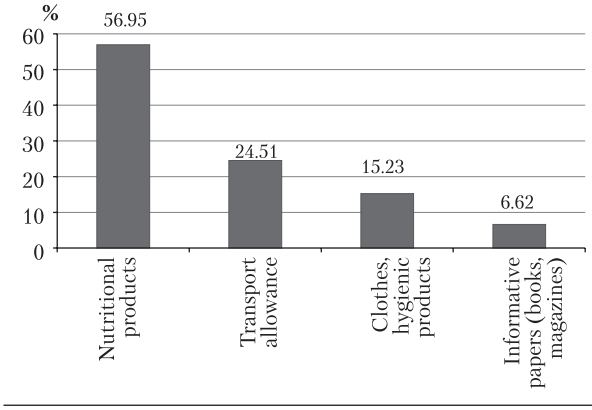

Fig. 12. **Distribution of the patients according to the desired social assistance**

living in couple group. Single state had one half of the sample and married was every third patient. A minor proportion did not declare the civil state. However, when they were asked about the number of the family members, two thirds of the sample declared having three and more family members (Fig. 9).

The major research outcome was the assessment of the real social-economic state of the patient and perceived stigma. When patients were asked about the personal income, one half of the sample answered «lack of income» and one half answered «lost the job/employment due to the disease». Every fifth before being sick had less than 20 $ per month personal income (Fig. 10). Exposed data could be defined as stigma signs. At the question if the financial support represents a measure for improving the treatment compliance 88 (58.28%) patients answered «yes».

When the patients were asked about their assistance requirements the most of them, 96 (63.57%), answered «social and financial support» and in a lower proportion asked for the «support of the associated diseases» and support in the, «disability degree obtaining». Disability degree document permits to the patient to have social and financial conventional assistance. A minor part asked for information about the «disease evolution and awareness regarding the treatment» (Fig. 11).

When they were asked about the accessibility of the social assistance organizations, the most of them (67.55%) answered the presence in the «own locality» and one third mentioned the necessity to take medium and large distance buses for arriving at the social assistance services. When they were asked what type of the social assistance is needed, one half answered «nutritionalproducts» and every fifth asked for the «transport allowance» for coming every day to the specialized out-patient setting to receive the treatment. A low rate of the sample asked for the clothes, hygienic products and written informative papers such as books, magazines or newspapers (Fig. 12).

When they were asked about where they desire to be treated, the most of them, 108 (71.52%) preferred the hospital, 35 (23.18%) treatment in ambulatory conditions (out-patient settings) and 7 (4.63%) medical specialized organizations from abroad. At the question if they will change the residence, as an important requirement for the patient's follow-up 111 (73.51%) answered «no» and 40 (26.49%) «yes».

The study assessed all social, economic and epidemiological risk factors, as well as disease related characteristics, such as tuberculosis radiological forms, severity, the microbiological characteristics of 272 patients treated after «loss to follow-up». The sample included patients treated during 6 years in the frame of the clinical subdivisions of the Institute of Pneumophtysiology.

Obtained data were in concordance with the national published papers [3, 4, 7]. Summarizing obtained data in the actual study it was argued that young, men are more exposed to drop up the tuberculosis treatment than the general tuberculosis cohort. Case-detection was performed in a similar proportion by primary health care staff, as well as during the direct addressing of the patient to the specialized hospitals. By the other hand, the general cohort of the tuberculosis patients usually use the primary health care level in detection, diagnosis and follow-up [7].

Epidemiological endangered patients, such as those with history of migration and imprisonment were in a higher proportion in our study comparing with the Moldovan series studies, demonstrating their vulnerability, as well as the higher risk of spreading the infection [6]. A higher rate of microbiological positive and drug-resistant patients, as well as the high rate of the retreated case with severe forms argued the importance of the epidemiological vigilance regarding those patients.

A Moldovan project report on the assessment of the risk factors associated with the treatment adherence of the drug-resistance patients established a similar high rate of the economical vulnerable patients, with low level of education and insufficient knowledge about the disease. The study established a lower proportion of the patients requiring the social assistance as our study [3].

The actual study identified a high rate of stigmatized patients assessed through the loosing the employment due to tuberculosis, having no any social assistance provided by the state or community organizations and desiring to be treated in the hospital due to high social and economic vulnerability. The same problems were defined by the international studies [8—10]. The social and financial support was required by the most of the patients, by the other side the low accessibility of the social supportive organizations was established in a high proportion, as in published data [10]. Transport allowance and the desire to change the place of residence showed a greater risk to drop-up the treatment in the future.

Conclusions

After a national implementation of DOT strategy the poor treatment outcomes, increased due to standardized approach of the tuberculosis patient.

The most of the patients treated after loss to follow-up were men, in early and middle adulthood, economically vulnerable, without social protection and from the epidemiological endangered groups.

Patient's avoidance of the primary health care staff, direct addressing to the hospital with severe forms of tuberculosis, microbiological positive status were the characteristics that showed the importance of a high vigilance regarding high risks for therapeutic drop-up.

When interviewing the most of the patients required the social and financial support, but the low accessibility of the social organizations was established in a high proportion.

Raising awareness among social vulnerable patients about the treatment completion, emphasizing that the treatment is free of charge and will not be started after the drop-up probably will improve treatment outcome.

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No conflicts of interest.
Participation of authors: concept and research design — E. Lesnic, L. Todoriko; collection of material — S. Ciobanu, A. Malic; collect of material — E. Lesnic; writing the text — E. Lesnic; statistical processing of data — S. Ciobanu, A. Malic; editing text — E. Lesnic, L. Todoriko.

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Е. Леснік[1], С. Чобану[2], Л. Тодоріко[3], А. Малік[1]
[1] Державний університет медицини і фармації імені Ніколая Тестеміцану, Кишинів, Республіка Молдова
[2] Інститут фтизіопульмонології «Кирило Драганюк», Кишинів, Республіка Молдова
[3] ВДНЗ України «Буковинський державний медичний університет», Чернівці, Україна

Детермінанти втрат відповідно до результатів спостереження за хворими на туберкульоз і роль соціальної підтримки

Туберкульоз є серйозною проблемою громадського здоров'я в усьому світі. Основними соціальними детермінантами туберкульозу та низької ефективності його лікування є соціальна й економічна нерівність, високий рівень міграції, швидка урбанізація.

Мета роботи — оцінити основні детермінанти втрат зі спостереження хворих на туберкульоз і роль соціальної підтримки.

Матеріали та методи. Проведено вибіркове ретроспективне описове дослідження соціальних, економічних та епідеміологічних особливостей діагностики та ведення випадків, оцінка радіологічних та мікробіологічних показників 272 пацієнтів із Республіки Молдова з туберкульозом легень, втрачених зі спостереження, з яких 151 був опитаний.

Результати та обговорення. Встановлено, що більшість пацієнтів були чоловічої статі молодого віку, економічно уразливі, без соціальної допомоги, які перебували в контакті з хворими на туберкульоз. Кожен третій пацієнт не звертався по первинну медико-санітарну допомогу, а приходив безпосередньо в спеціалізовану лікарню, де було діагностовано тяжкі форми туберкульозу, мікробіологічно позитивні, зі стійкими штамами.

Висновки. Після національної реалізації стратегії DOT збільшилася кількість випадків з поганими результатами лікування через стандартизований підхід до хворого на туберкульоз.

Більшість пацієнтів, яких лікували після втрати з-під подальшого спостереження, були чоловіки в молодому і середньому зрілому віці, економічно уразливі, без соціального захисту та з груп, що перебувають під загрозою епідеміологічного впливу.

Уникнення пацієнтом персоналу первинної медико-санітарної допомоги, пряме звернення до лікарні з тяжкими формами туберкульозу, позитивний мікробіологічний статус — ось ті характеристики, які засвідчили важливість особливої пильності щодо груп високого ризику стосовно переривання курсів терапії.

Ключові слова: туберкульоз, фактори ризику, втрати щодо спостереження.

Э. Лесник[1], С. Чобану[2], Л. Тодорико[3], А. Малик[1]
[1] Государственный университет медицины и фармации имени Николая Тестемицану, Кишинев, Республика Молдова
[2] Институт фтизиопульмонологии «Кирилл Драганюк», Кишинев, Республика Молдова
[3] ВГУЗ Украины «Буковинский государственный медицинский университет», Черновцы, Украина

Детерминанты потерь согласно результатам наблюдения за больными туберкулезом и роль социальной поддержки

Туберкулез представляет собой серьезную проблему для здоровья во всем мире. Основными социальными детерминантами туберкулеза и низкой эффективности его лечения являются социальное и экономическое неравенство, высокий уровень миграции, быстрая урбанизация.

Цель работы — оценить основные детерминанты потерь из-под наблюдения больных туберкулезом и роль социальной поддержки.

Материалы и методы. Было проведено выборочное ретроспективное, описательное исследование социальных, экономических и эпидемиологических особенностей диагностикии ведения случаев, оценку радиологических и микробиологических характеристик 272 пациентов из Республики Молдова с туберкулезом легких, потерянных из-под наблюдения, из которых 151 были опрошены.

Результаты и обсуждение. Большинство пациентов были мужчины молодого возраста, экономически уязвимые, без социальной помощи и находящиеся в туберкулезном контакте. Каждый третий не обращался за первичной медико-санитарной помощью, а приходил непосредственно в специализированную больницу, где были диагностированы тяжелые формы туберкулеза, микробиологически положительные с лекарственно-устойчивыми штаммами.

Выводы. После национальной реализации стратегии DOT количество плохих результатов лечения увеличилось из-за стандартизированного подхода к больному туберкулезом.

Большинство пациентов, которых лечили после потери из-под последующего наблюдения, были мужчины в раннем и среднем зрелом возрасте, экономически уязвимые, без социальной защиты и из групп, находящихся под угрозой эпидемиологического воздействия.

Избегание пациентом персонала первичной медико-санитарной помощи, прямое обращение в больницу с тяжелыми формами туберкулеза, положительный микробиологический статус — это те характеристики, которые показали важность высокой бдительности в отношении групп высокого риска прерывания курса терапии.

Ключевые слова: туберкулез, факторы риска, потеря из наблюдения.

Контактна інформація:

Леснік Евеліна Володимирівна, к. мед. н., асист. кафедри фтизіопневмології
MD 2001, Республіка Молдова, м. Кишинів, бульв. Штефан чел Маре, 165
E-mail: evelinalesnic@yahoo.com.

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