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Predictive exogenous conditions for tuberculosis treatment default

Objective — exogenous risk factors were studied at 142 new pulmonary TB cases with treatment default comparing with 105 succesfully treated patients under DOTS strategy.

Materials and methods. The high TB incidence (104.6/100.000 in 2012) and low treatment succes rate (62 % in 2012) is mainly due to a high default (7.8 % in 2012) and failure rate (3.5 % in 2012) and characterise the epidemiological situation in Republic of Moldova.

Results and discussion. According to predictible value, high risk factors for default were: male sex, economic disadvantaged state, single civic status, codependence, previously released from detention; medium risk factors — low education level, extrem poverty.

Conclusions. Social, educational support and withdrawl techics must be implemented to all patients exposed to risk factors for enhancing tuberculosis treatment result.

Key words

TB risk factors, treatment, epidemiology of TB risk.

Republic of Moldova reports a high TB incidence (104.6/100.000) and a low treatment succes rate (62 %) due to the high rate of default and failure rates. In 2001 was approved the first National TB Control Programme (NCP), started as a pilot project in the municipality Chişinău [1]. At the basis of NCP rests the DOTS strategy (Directly Observed Treatment Short Course Chemotherapy) with the basic principles: at least 70 % of symptomatic patients to be detected by passive way and direclty supervised 6 months treatment. Despite of high financial investment in laboratory equipment and patient's supporting measures the objectives were not achieved. The highest default rate is established during the continous phase of the treatment performed in out-patient settings. As consequence of non-adherence in 2013, 7.8 % of patients were lost/defaulted during DOTS treatment (27.3 % defaulted DOTS Plus), 11 % died, 3.5 % failed the treatment and 13 % weren't evaluated. Besides the continuous increasing of the epidemiological danger of unsuccesfully treated patients it is an evident increasing of MDR-TB rate. National surveillance study established that primary MDR-TB is repported at 25 % of new cases and acquired MDR-TB at 61 % of previously treated patients (in 2012) [1]. At the most of patients (90 %), the treatment interruption is determined by social risk factors and biological features (young age, male sex, some physiological conditions, comorbidities) [1, 2, 5]. Clinical factors (clinical improvement under treatment, adverse drug reactions), therapeutical factors (drug interactions with associated medication, iatrogenic treatment interruptions, individualised treatment) and management factors (interrupted suppling, suboptimal drug quality, non-observed treatment). Enumerated conditions prevale in low income regions with defficiencies in heath care delivery systheme. Sthereotip, non-adherent to treatment behaviour of patients with TB, encreases the severity of underlying related factors. Risk factors association have an more important impact on the treatment result than the expressivity of one risk factor [1, 2, 4]. Risk assessement of treatment default is mostly necessary before starting the treatment, for application of risk reduction measures for improving the treatment succes rate.

Table 1. **Educational level of the TB patients**

School level	Control group (M ± m), %	Study group (M ± m), %
Primary school	11.4 ± 3.01	14.8 ± 2.97
General incomplete	5.71 ± 2.26	14.1 ± 2.97
Secondary school	60.0 ± 4.78	55.6 ± 4.16
Medium professional	13.3 ± 3.31	10.5 ± 2.57
Superior studies	9.52 ± 2.87	1.41 ± 0.98*

Legend. * Statistical diference between groups. Same table 2—4.

Table 2. **Economical state of TB patients**

Economic state	Control group (M ± m), %	Study group (M ± m), %
Employed	28.57 + 4.41	8.45 ± 2.33*
Unemployed	56.19 ± 4.84	83.09 ± 3.14*
Retired/disabled	10.47 ± 9.89	6.33 ± 2.04
Student	4.77 ± 2.07	1.41 ± 0.98

Table 3. **Civil state of TB patients**

Indicator	Control group (M ± m), %	Study group (M ± m), %
Married	63.80 ± 4.03	37.6 ± 4.6*
Unmarried	21.91 ± 3.92	40.3 ± 4.6*
Divorced/widow	14.29 ± 3.41	18.3 ± 3.7

Table 4. **High risk groups structure**

Indicator	Control group (M ± m), %	Study group (M ± m), %
Active smokers	61.97 ± 4.07	80.7 ± 3.7*
Chronic alcohol abusers	16.2 ± 6.6	50.4 ± 4.7*
Drug users	0	4.5 ± 2.0*
From TB cluster	29.7 ± 7.5	26.6 ± 4.2
Migrants	29.7 ± 7.5	21.1 ± 3.2
Released from detention	0	16.5 ± 3.5*
Homelesses	0	1.8 ± 1.2
Living in limiting conditions	35.2 ± 6.6	66.9 ± 4.5*

Aim. Assessment of the predictive exogenous conditions of treatment default within DOTS strategy.

Materials and methods

Were studied exogenous conditions influencing treatment succes rate: social characteristics (economic state, educational level, matrimonial state, social harmful habits). Epidemiological characteristics were assessed considering the high frequence of the treatment default established in TB clusters. A selective, retrospective and case-control study of a total number of 247 new pulmonary TB cases, distribuited in a study group (SG), consisted of 142 patients which defaulted the treatment and a control group (CG) of 105 succesfully treated patients.

Results

The same distribution by gender was revealed in both groups, with significant predominance of males *vs* females ((80.28 ± 3.39) % *vs* (19.69 ± 3.39) % females in SG and (62.86 ± 4.07) % *vs* (37.14 ± 4.07) % females in CG; $p < 0.001$), male/female rate in SG was 4.07/1; in CG was 1.67/1. Young age (18—44 years) predominated in SG ((76.0 ± 3.24) % *vs* (58.1 ± 2.81) % $p < 0.01$). Concluding the data, male gender was apreciated as high risk factor for default with OR = 2.74 (CI 95 %: 1.53—4.89) and young age (< 44 years) was assessed as low risk factors (OR = 1.32 (CI 95 %: 0.96—1.57).

Educational status was revealed according accomplished study level. Despite of a similar group distribution, incomplete studies (that included primary and general incomplete school) prevaled in SG ((28.87 ± 3.81) *vs* (16.1 ± 3.59) % $p < 0.01$), being apreciated as medium risk factor for default with OR = 1.72 (CI: 95 %: 0.94—3.17) (table 1).

Assessing economical status it was established the predominance of unemployed patients in SG ((83.09 ± 3.14) % *vs* (56.19 ± 4.84) $p < 0.001$). The total economicaly disadvantaged persons (unemloyed, retired, disabled, students) predominated in SG ((91.55 ± 3.65) % *vs* (71.43 ± 4.41) % $p < 0.001$), their state being assessed as major risk factor for default with OR = 50.68 (CI 95 %: 11.90—215.78) (table 2).

Matrimonial level was assessed according legal civic status. Unmarried persons prevaled in SG ((40.3 ± 4.6) % *vs* (21.91 ± 3.92) %) and married persons — in CG ((63.80 ± 4.03) % *vs* (37.6 ± 4.6) % $p < 0.001$). Summing all single civic (unmarried, divorced, widows) patients, it was established their predominance in SG ((68.31 ± 3.91) % *vs* (37.14 ± ± 4.71) %; $p < 0.001$), their state being evaluated as high risk factor for defaulting the TB treatment with OR = 2.88 (CI 95 %: 1.50—5.52) (table 3).

All assessed harmful habits (active smoking, alcohol abuse and drug iv using) predominated in SG. In the this order smoking was a high risk factor OR = 2.92 (CI 95 %: 1.51—4.32), also alcohol abuse OR = 7.64 (CI 95 %: 3.01—19.38, both being appreciated as codependent habits; drug using had a low risk value OR = 2.11 (CI 95 %: 0.23—19.14). Epidemiological high risk groups of the general population (migrants, homelesses, patients from TB clusters) prevaled in SG, without reaching the statistic threshold. Apreciating their predictible value it was established that low risk factors were: belonging to TB cluster OR = = 1.31 (CI 95 %: 0.59—2.90), migration OR = 1.42 (CI 95 %: 0.73—2.79), extreme poverty OR = 2.33 (CI 95 %: 1.84—7.48); and high risk factor being assessed as the state of the released from the detention OR = 8.71 (CI 95 %: 2.36—137.55) (table 4).

Conclusions

High risk factors for default were: male sex, economic disadvantaged state, single civic state, codependence (active smoking, alcohol abuse), state of the released from detention. Medium risk factors are: incomplete education level, extreme poverty. Other exogenous conditions were assessed as low risk factors and only in absence of other controversial data. Social, educational support and withdrawl techics for harmful habits must be more intensively applied to all cathegories of patients exposed to enumerated risk factors for reducing the predictibility for treatment of default.

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Екзогенні чинники ризику як умови для боротьби з туберкульозом

Мета роботи — вивчення екзогенних чинників ризику в 142 нових випадках туберкульозу легень з неуспішним лікуванням порівняно з 105 успішно пролікованими хворими по DOTS-стратегії.

Матеріали та методи. Захворюваність на туберкульоз в Республіці Молдова на сьогодні досить висока (104,6 на 100 тис. у 2012 р.), ефективність лікування низька (62 % у 2012 р.) в основному через переривання програми терапії (7,8 % у 2012 р.) і відмов (3,5 % у 2012 р.), що характеризує епідеміологічну ситуацію як не цілком благополучну.

Результати та обговорення. До високих чинників ризику зараховують чоловічу стать, економічно несприятливу ситуацію в країні, високий рівень міграції, кількість звільнених з-під варти. До середніх чинників ризику зараховують неповну освіту і крайню бідність.

Висновки. Соціальна освітня та технічна підтримка повинні бути реалізовані для всіх осіб, які належать до груп ризику із захворювання на туберкульоз, з метою підвищення ефективності контролю за епідеміологічною ситуацією з цього інфекційного захворювання.

Ключові слова: чинники ризику з туберкульозу, лікування, епідеміологія туберкульозу, ризик.

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Контроль экзогенных факторов риска как условие для борьбы с туберкулезом

Цель работы — изучение экзогенных факторов риска в 142 новых случаях туберкулеза легких с неуспешным лечением по сравнению с 105 успешно пролеченными больными по DOTS-стратегии.

Материалы и методы. Заболеваемость туберкулезом в Республике Молдова на сегодняшний день достаточно высока (104,6 на 100 тыс. в 2012 г.), эффективность лечения низкая (62 % в 2012 г.) в основном из-за прерывания программы терапии (7,8 % в 2012 г.) и отказов (3,5 % в 2012 г.), что характеризует эпидемиологическую ситуацию как не вполне благополучную.

Результаты и обсуждение. К высоким факторам риска относят мужской пол, экономически неблагоприятную ситуацию в стране, высокий уровень миграции, количество уволенных из-под стражи. К средним факторам риска относят неполное образование и крайнюю бедность.

Выводы. Социальная образовательная и техническая поддержка должны быть реализованы для всех лиц, относящихся к группам риска по заболеваемости туберкулезом, в целях повышения эффективности контроля за эпидемиологической ситуацией по данному инфекционному заболеванию.

Ключевые слова: факторы риска по туберкулезу, лечение, эпидемиология туберкулеза, риск.

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