Overlapping Risk Factors But No Association Between HIV and Drug Resistance Among TB Patients in Kazakhstan

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Background:

Kazakhstan has a high prevalence of multi-drug resistance (MDR) among tuberculosis (TB) cases and a low, but growing, HIV prevalence.

Objectives:

Using the 2007-2011 national electronic TB register:
• Describe the epidemiology of MDR and HIV among TB cases.
• Establish whether there is an association between MDR and HIV among TB cases.

Results:

Patient characteristics
• In 2007-2011, a total of 146,416 patients diagnosed with TB were notified and started treatment.
• The notification rate per 100,000 populations went down from 184 in 2007 to 156 in 2011, and average relative annual decrease of 4%.
• Half of all TB patients diagnosed are young adults (15-34 years) and 60.5% are male.
• Excluding transfer-in patients for whom treatment history is unavailable in the electronic register, 20% of patients are diagnosed with new smear-positive TB, 45% with new smear-negative TB, and 35% with previously treated TB.
• Among new patients, 31.2% were smear-positive. Of all smear-positive TB patients 69.2% had a positive culture result registered compared to 16.6% of all smear-negative TB patients. Overall, 41.6% of patients have a positive smear at diagnosis, and 38.6% a positive culture. DST results are available for 92.7% of culture-positive cases.

HIV
• HIV-testing results were available for 142,349 (97.2%) TB patients. Among all TB patients HIV prevalence increased from 0.6% to 1.5%.
• HIV prevalence was the highest among patient returning after default (2.7%).
• Characteristics statistically significantly associated with HIV in multivariate analysis were drug use (OR=56.2, 95% CI 48.1-65.7), prison history (OR=5.7, 95% CI 4.7-6.8), alcoholism (OR=2.7, 95% CI 2.4-3.1) and homelessness (OR=2.8, 95% CI 2.4-3.3).

Drug Resistance
• Among the 50,859 (36%) notified TB patients with a HIV-test result and known drug susceptibility profile, 38.3% had TB sensitive to all first-line TB drugs, 8.5% had TB with mono-resistance to one of these first-line drugs, 17.1% had poly-resistant TB, and 36.1% had MDR-TB.
• The prevalence of MDR-TB patients did not show a clear trend over the years 2007-2011, also not when stratified by new and retreatment patients.

MDR was most prevalent among patients who failed previous TB treatment (56%) and among those who relapsed after successful treatment (48%), and least high among new patients (27%).
• Characteristics statistically significantly associated with MDR-TB were a history of previous treatment (OR=3.6, 95% CI 3.3-4.0), a history of imprisonment (OR=2.1, 95% CI 1.9-2.4), homelessness (OR=1.2, 95% CI 1.1-1.3), urban residency (OR=1.1, 95% CI 1.05-1.1) and younger age groups.

Association between MDR and HIV
• In univariate analysis, HIV-infection status was associated with an increased prevalence of MDR (OR=1.2, 95% CI 1.02-1.4).
• TB patients at particular risk for being infected both with HIV and MDR were those using drugs (12.5%), and those with a history of imprisonment (3.4%).
• In multivariate analysis, when adjusting for patient characteristics, the association between MDR and HIV disappeared (OR=1.0, 95% CI 0.86-1.2).

Conclusions:

Among TB patients in Kazakhstan, risk factors for HIV and MDR are largely overlapping. However, MDR-TB prevalence was not associated with HIV-status. TB patients from socially vulnerable groups were at particular risk for HIV/MDR co-infection. These patients are at an increased risk of being HIV positive and contracting drug-resistant TB, which increases their risk of mortality, complicates patient management, and may facilitate transmission of MDR-TB.

Recommendations:

Enhanced efforts are necessary to provide care to these socially vulnerable populations:
• Active case finding,
• ART for HIV positive individuals to prevent development of MDR-TB,
• Psychosocial support to successfully finish MDR-TB treatment.