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Evaluation of the agreement between Quantiferon-TB assay and Tuberculin skin test in TB infected cases: Tehran, Iran

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Background: A recently developed whole-blood interferon (Quantiferon-TB) assay shows promise for the diagnosis of recent tuberculosis infection.

Objective: Comparison the agreement between the Quantiferon TB assay and the 5-TU dose of purified protein derivative (PPD) in the diagnosis of recent TB infection in house hold contact of of cases with proven active pulmonary TB in BCG-vaccinated population in Tehran.

Methods: A cross-sectional analytic study conducted in a tertiary referral hospital in Tehran, Iran (2009-2011) upon 59 recent household e contacts of active pulmonary TB (bacteriologically proven) selected by convince sampling. All the cases were immune competent;which had received BCG vaccine at birth; without treatment. The PPD was defined as positive at an induration of > or =5 mm. Each child who tested positive on the PPD was referred for medical evaluation. Results of QuantiFERON-TB assay and the PPD test compared in cases. *P*-values < 0.05were considered statistically significant. Mc Namara and computing kappa statistics used for assessing the concordance between the PPD and whole-blood IFN- assay.

Results: Among 59 cases:agewas: 1-69 years;Mean:.42 ± 17.84 years .42.7% (54) of cases were male; 57.6% (66) were female. family size was 1-8 persons;mean: 3.61-0.929. Overall, Induration size for PPD test was between 0-40 mm; mean:7.56 ±6.66 mm.

The overall agreement between the PPD and the QuantiFERON-TB assay in studied cases was fair to good.(= 0.556)

According to T-Test; a significant difference observed between cases with positive PPD (3.97 ± 2.295 mm) and negative PPD(0.85 ± 0.261 mm) in mean of Quantiferon -TB assay (T = 2.301;*P* =0.025)..PPD test in compare with Quantiferon -TB assay had sensitivity = 57.1%, specifity = 86.6%, Positive Predictive Value (PPV) =57.1%, Negative Predictive Value (NPV) =86.6%; positive likelihood ratio+ (LR + =4.29);negative likelihood ratio-(LR-=0.49).

Conclusion: It seems that Quantiferon -TB assay had greater specifity in compare with PPD and is a better indicator of the risk of *M tuberculosis* infection than PPD in Iranian cases as an intermediate tuberculosis-burden country with a BCG-vaccinated population. Adding the Quantiferon -TB assay to conventional PPD test (low sensitivity = 57%) is useful for definite diagnosis of TB infection in high risk groups

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The historical reconstruction of the "Beijing" genotype spreading of *Mycobacterium tuberculosis* in Russian Federation and former USSR countries by the methods of molecular epidemiology

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Background: The aim of this study was to determine the most epidemiologically important genotypes (spoligotypes) of *M. tuberculosis* strains in Russia and in neighboring countries and to propose scenario of it spreading. Different *M.* tuberculosis lineages are more prevalent in specific geographical regions. "Beijing" family of *M. tuberculosis* strains is distributed mainly in East and Southeast Asia and only marginally represented in Western Europe. In Russia and former USSR countries about 50% of isolated TB strain belonged to Beijing family. We described model of human migration waves on the territory of the USSR as a factor of the TB dissemination.

Methods: Spoligotype data were taken from online database SITVIT. In total it has been analyzed more than three thousand genotypes from Russia, Latvia, Estonia, Finland and Poland. This data were analyzed by SpolTool software. DESTUS software was used for identification emerging TB genotypes in each country.

Results: It was found that in Russia the epidemiologically important spoligotypes are ST1 (Beijing), ST53 (T1), ST252 and ST42 (LAM9), ST254 (LAM), ST1134, ST262, ST35 (Ural). All of these genotypes may be divided into three groups by their origin: European (T1 and LAM9), Asian (Beijing) and Russian (Ural). It should be emphasized that despite the fact that among countries border of Russia only for the ex-USSR countries (Latvia and Estonia) ST1 (Beijing) has epidemiological importance.

Conclusion: The process of dramatic spreading of ST1 (Beijing) genotype on the territory ex-USSR countries could have occurred in the beginning of 20th century when USSR had been created. At this time, large groups of people from the Russian-speaking communities in China (builders of the Chinese Eastern Railway) migrated to the USSR. After all they were arrested and imprisoned. The prison system (GULAG) perhaps has been the main route of the spreading of Beijing genotype in the USSR. In conclusion, we note that the prevalence of Beijing genotype in Russia requires special attention and possible application of the standards of treatment and diagnosis of tuberculosis used by the Public Health Service of East and Southeast Asian countries where Beijing is the principal genotype of TB.

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