

LATENT TUBERCULOSIS; JAIL AS A RISK FACTOR

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ABSTRACT... Objectives: To assess the degree to which Latent Tuberculosis exist among long-term inmates in jail. **Study Design:** Prospective Cohort Analytic Experimental Quantitative Data. **Setting and Period:** Jails at Bahawalpur between 2009-2010. **Methods:** We monitored the Moutex Test of prisoners within 48 to 72 h and those who were 10 mm or more were considered positive and for HIV positive 5 mm criteria were set to declare positive. **Group 1**-who were in jail for more than a year and those, **Group 2**-who were in jail for less than one month. Data was collected on a proforma. Each prisoner had thorough clinical examination with detailed clinical history and Chest X-ray. **Inclusion Criteria:** 1. All those prisoners who never had tuberculosis in past. 2. All those prisoners who were not on Anti Tuberculous Therapy. 3. All those prisoner whose chest x ray was normal and had no symptoms of tuberculosis. **Exclusion Criteria:** 1. All those who had tuberculosis in past or were on antituberculous treatment currently. 2. All those who were having chronic cough. **Results:** Total number of prisoners in group 1 were 298 and number of prisoners in group 2 were 128. Latent tuberculosis was found in total of 31(10.40%) of prisoners in group 1 and none of prisoners in group 2 were having latent tuberculosis. **Conclusions:** Jail inmates for more than 1 year did show more numbers of latent tuberculosis patients than the new inmates. These results suggest that the close contacts harbor the live tubercle bacilli and in future they may convert into active cases.

Key words: latent tuberculosis and jail in Pakistan, latent tuberculosis.

INTRODUCTION

The latent tuberculosis is the form of tuberculosis which never shows signs and is without any symptoms. Instead, the diagnosis of latent infection needs measurement of host immune responses for the presence of live mycobacteria¹. And this is done by doing Tuberculin Test. Recently interferon γ release assay (IGRA) has been introduced as more reliable technique for its diagnosis¹. IGRA detects the release of IFN- γ in response to Mycobacterium tuberculosis– specific antigens^{1,2}. But considering the cost and availability of IGRA, Moutox Test is still popular.

According to a survey in Pakistan the prevalence of Latent tuberculosis is 40% and approximately 50 million people are suffering from this problem. This number is far more than the number of active cases that exist in the community (more than a half million)³.

During 1999-2000, the prevalence of latent tuberculosis in USA was 4.2%. Much remains unknown about latent infection with Mycobacterium tuberculosis but still its importance became evident when USA not only treated

active cases but also latent tuberculosis cases to decrease the burden of disease in the community⁴.

Prisons have been identified as having high TB infection prevalences and high transmission risks^{5,6}.

Tuberculosis is one of droplet infections and about 1-2 percent of close contacts may develop active tuberculosis disease while 31 to 36 percent will have LTBI and among these 3 to 5 percent will develop tuberculosis within 2 years of infection. Relative risk factors for developing active tuberculosis are, Silicosis, Diabetes mellitus, chronic renal failure and hemodialysis, gastrectomy, jejunoileal bypass, renal and cardiac transplant and carcinoma of head and neck⁷.

Furthermore it proven that contact investigations are an effective method for identifying high risk persons⁸. The purpose of our study was strictly about the identification of those subclinical cases that are at future risk of developing active tuberculosis.

This is the priority of most countries, national

tuberculosis (TB) elimination strategies to reduce the pool of persons infected with Mycobacterium tuberculosis in order to prevent future TB cases due to progression from latent TB infection (LTBI). This can only be done by treating such cases^{9,10}.

As far as treatment for latent tuberculosis there are studies available that proves that rifampicine and isoniazide treatment has been shown to be acceptable and well tolerated by jail inmates and tuberculosis controlling societies can build on these successes to expand its successful use to eliminate tuberculosis in the country¹¹.

METHODS

In this Prospective Cohort Analytic Experimental Quantitative Data 426 inmates were included who were in jail between 2009-2010 . Data was collected on a Performa. Each prisoner had thorough clinical examination with detailed clinical history and Chest X-ray.

All those prisoners who never had tuberculosis in past along those who were not on anti Tuberculous Therapy and whose chest x ray was normal and had no symptoms of tuberculosis e.g. cough, hemoptysis, lymphadenopathy were included in the study.

Those who met the inclusion criteria were subjected to Moutox test. The study group was divided into two ,

Group 1-who were in jail for more than a year and those, **Group- 2**-who were in jail for less than one month.

However All those who had tuberculosis in past or were on antituberculous treatment currently along those who were having chronic cough with or without chest x-ray

abnormalities were excluded from the study.

We monitored the Moutox Test of prisoners within 48 to 72 h and those who were 10 mm or more were considered positive and for HIV positive 5 mm criteria were set to declare positive.

RESULTS

Total number of prisoners in group 1 were 298 and number of prisoners in group 2 were 128. Latent tuberculosis was found in total of 31(10.40%) of prisoners in group 1 and none of prisoners in group 2 were having latent tuberculosis.

The percentage of incidence proportion of latent tuberculosis in group one was 10.40%. The risk difference was 0.1040 per person per year.

DISCUSSION

Contact investigations look cumbersome and require significant time and cost. The ultimate goals of these efforts are not to only identify the cases of latent tuberculosis but also to complete treatment of latent TB infection as an integral part of the contact management process.

The risk (cummulative incidence or incidence proportion) of latent tuberculosis in our study was 10.40%. Person-time incidence rate is 31 per 298 persons-year. In our study although the risk in group 2 was zero thus contributing the zero relative risk to the study population but risk difference was 0.1040 per person per year (10 people per 100 develop disease in a year) . Whereas the incidence of latent tuberculosis in two different jails of USA in 1989-91 and 1993-94 were 5.91% and 8.37% respectively. This incidence further reduced to 0.53% during years 2000-2001¹². while in Brazil during 1992-93

Table. Results

Risk (cummulative incidence or incidence proportion)	Person-time incidence rate	Risk in Group 2	Relative risk to the study population	Risk difference
10.40%	31 per 298 persons-year	-	-	0.1040 per person per year (10 people per 100 developed disease in a year)

incidence rate was 30.9%¹². Similarly the risk difference showed a significant decline at USA prisons 130 per 2201 in 1989-91 and 49 per 9746 in 2000-2001 respectively. However the Brazilian prison has quite a significant risk of involvement 21 per 68 persons¹². This clearly shows that developed country like USA was successful in restricting the numbers of affected contacts even two decades ago.

According to a survey in Pakistan the risk (cumulative incidence or incidence proportion) of latent tuberculosis in our community was 29% which is higher than in jail in our study (10.40%). Person time incidence rate calculated was 50000000 per 172382000 persons³. The comparison ratio between community and jail was 4807692:1 (a greater inequality).

The treatment of latent tuberculosis is considered a main step to halt the process to conversion to active disease. This has been emphasized in many studies⁹. To ensure treatment compliance for this lengthy period most of the authors assessed the treatment outcome of latent tuberculosis patients using short course chemotherapy that also helps in reducing the risk of mono-resistance^{9,10,11}.

In Pakistan there are no guidelines being followed for the diagnosis and treatment of latent tuberculosis hence we were not able to assess the treatment response.

RECOMMENDATION

1. Future studies should measure the impact of latent tuberculosis treatment in prisons and in community in Pakistan.
2. And assess the population attributable risk of prison-to-community spread after its treatment. As currently we are releasing the prisoners without treating latent tuberculosis and they might have contributing to the increased incidence. Moreover Current CDC guidelines emphasizes the treatment of latent TB infection regardless of birthplace, age, previous BCG vaccine administration, skin test conversion¹¹.
3. Active case finding must focus on identified risk groups for tuberculosis, such as prisoners/close

contacts.

4. Diagnosis and treatment of LTBI must be introduced in the prisons/national/Pakistan Chest Society guidelines to "speed up" the elimination of TB.

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The policy of being too cautious
is the greatest risk of all.

Jawaharlal Nehru (1889-1964)