Is Screening For HIV In Female Tuberculous Patients Cost Effective?

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MSM UU conceived idea, UU drafted the study, UU collected data, MSM UU did statistical analysis & interpretation of data, MSM UU critical reviewed manuscript, Both approved final version to be published.

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The Authors declares that there is no conflict of interest.

Abstract

Background: Tuberculosis is one of most ancient documented disease and yet with so much progress in medicine, it still in top ten deadly diseases. HIV has changed the scenario when it combines with TB. TB which was initially thought to be disease of developing countries is now a major public health problem for developed nation as well. In two thousand seventeen 940,000 people died of AIDS-related illnesses. Pakistan ranks 5th among high burden tuberculous patients countries. Fortunately, HIV is less prevalent here. As most of health committees recommend screening for HIV at the time of diagnosis of TB. No study to our date has been done specifically in female population with this context to evaluate the prevalence and cost effectiveness of HIV screening.

Objective: Objective of the present study was to see the prevalence of HIV among female tuberculous patients presenting to pulmonology ward Gulab Devi Chest Hospital Lahore.

Methodology: This was cross sectional study that was carried out from July 2018 to August 2018. Only female patients with age more than fourteen years were enrolled. Physician based diagnosis or bacteriological positive tuberculous patients were eligible for study. Both pulmonary and extrapulmonary tuberculosis patient were included. Once consent given for HIV test, patients were tested for HIV by screening.

Results: Four hundred and ninety two patients were presented and counselled for screening in the study period. Total of 426 patients were enrolled in the study with mean age of 39.2+17.7 years. Pulmonary tuberculosis (PTB) was commonest form of TB i.e. 91.3% (n= 368). Pleural effusion was the most common extra-pulmonary (EP) form of tuberculosis 10.3% (n= 44). Majority of patients were new cases 95.3% (n= 406). HIV screening was negative in most of patients 99.5% (n= 424).

Conclusion: Although tuberculosis is common here, HIV is less prevalent here. Screening for HIV, during routine workup for TB is beneficially in high burden countries for HIV. This study shows that it is not cost effective to screen our female population for TB, as HIV is less prevalent here when compared to male population. Moreover, with tightening economic situation and already heavy burden on health system, the screening for HIV will add to the cost of diagnosis of female tuberculosis patients, with little or no clinical benefit.

Key words: Human Immune Deficiency Virus (HIV); PTB; Extra-pulmonary tuberculosis (EPTB)

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Introduction

Gone are the days when the tuberculosis (TB) was considered only the disease of developing nation. With the spread of human immunodeficiency virus (HIV), the prevalence of TB increases dramatically despite adequate primary prevention in developed countries as well. Thus, HIV continues to be a major global public health issue. Unfortunately, 35.4 million people have died of AIDS-related illnesses since the first isolation and death reported in relation to HIV complications.[1] In 2017 alone, an estimated 36.9 million people were living with HIV and 940,000 people died of AIDS-related illnesses.[1]

There are still lots of patients who are suffering from HIV who have poor access to AIDs control program. In two thousand seventeen, only 59% of all patients living with HIV were accessing treatment and out of those, 47% were virally suppressed1. The poor control of HIV exposes the patients to long term effects of immunodeficiency that includes increase chances of opportunistic and non-opportunistic infections. TB is one of the main infectious agents with prevalence of 17% among HIV positive patients.[2] Without proper treatment, nearly all HIV-positive patient with TB will die.3 Thus, TB is a leading cause of death in HIV-positive patients and 40% of HIV deaths were due to TB globally.[3]

Seven countries globally account for 64% of the total burden of TB. Unfortunately, Pakistan ranks fifth among high burden countries.[3] According to UNAIDS program, there were about 130000 peoples living with AIDs in Pakistan. Among them 19000 were new cases and 5500 deaths were attributed to AIDS in two thousand sixteen alone.[3]

Fortunately, prevalence of HIV in our population is low (< 0.1%). Males are affected more as compared to females with 10:1 ratio.[4] Females who are HIV-positive usually belongs to certain groups such as female sex workers or male HIV-positive sex partner.

Objective

To see prevalence of HIV among female tuberculous patients presenting to Pulmonology ward Gulab Devi Chest Hospital Lahore.

Methodology

This was cross-sectional study carried out from July 2018 to August 2018.

Results

Eight patients were included in the present study including two female and six men. The mean age of patients was 39 years. The common clinical symptoms in all patients were dull chest pain and shortness of breath. Three out of eight patients had a past history of tuberculosis. None of the patients had a history of malignant tumour. No underlying cause was identified in five cases and were labelled as idiopathic. In all eight patients BAL was negative for any infection. Serology for immune and connective tissue disorders were negative in all eight cases. Biopsy samples through mediastenoscopy from the mediastenal lesion revealed no malignant or granulomatous tissues, though it revealed fibrous tissues. On CT two patients had diffuse involvement of mediastinum and six patients presented with local mass. Calcification was present in five cases. There was no contrast enhancement in all eight cases. Six of eight cases revealed narrowing of mediastenal structures, with two cases showing pulmonary artery narrowing, three with superior vena cava obstruction, two with tracheal narrowing and one with pulmonary vein narrowing. Right ventricular dilatation was seen in two cases. Three out of eight cases had additional pulmonary findings. One patient had localized interstitial pulmonary edema due to pulmonary venous compression and additional findings of pulmonary arteriovenous malformation in left lung. Segmental atelectasis with pneumonia was present in three cases. All eight patients were followed by follow up CT which revealed stable findings with slight progression of findings due to slow disease process

Samples and Data collection procedure:

Only female patients with age more than 14 years admitted to Pulmonlogy ward were included in the study. The patients enrolled were either diagnosed at DOTS facility or referred for treatment, or physician-based tuberculosis diagnosis. Both pulmonary and extra-pulmonary tuberculosis patients were included in the study. Written permission was taken from all enrolled participants/patients that their clinical and laboratory findings may be published scientifically without disclosing their identity.

Procedure:

Once the patient gave the consent for testing for HIV, standard procedure at bedside was performed to check their HIV status. It included

1. Pin prick of any finger pulp.
2. Draw the blood into capillary provided with the kit.
3. The HIV checking kit was then opened, and blood was transferred to the kit.
4. The solvent was then added to the kit (provided with kit).
5. After exactly 20 minutes the kit was read.
6. If only controlled line appeared, it was labelled negative.

7. If controlled and HIV line appeared, patient was labelled positive.
8. If HIV positive line appeared, but no control line, test was labelled as equivocal.

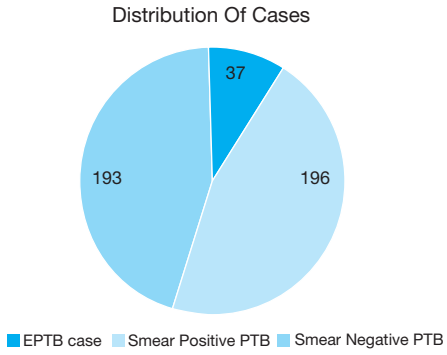
Statistical Analysis:

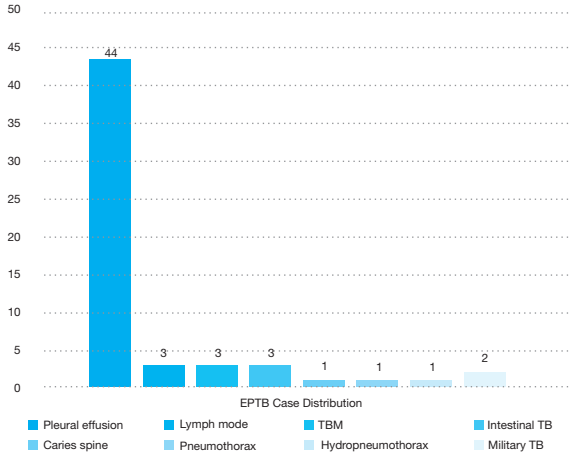
Descriptive statistics of all continuous variables were calculated as means and standard deviation, whereas categorical data were expressed as percentages. All analyses were done with SPSS version 20.0 for Windows.

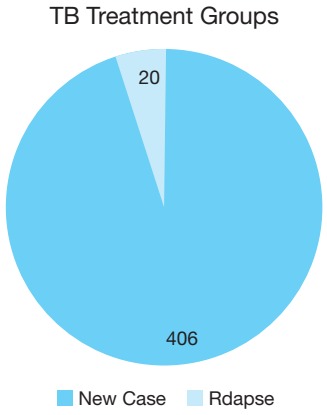
Results

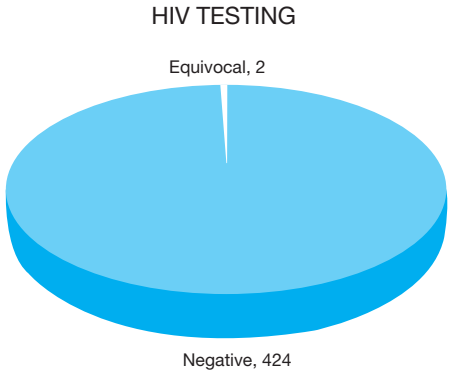
Four hundred and ninety two patients were presented and counselled for screening in the above period time and majority of patients agreed for screening. 426 patients were enrolled in the study.

The mean age was 39.2+17.7 years. Pulmonary tuberculosis (PTB) constitute highest number of patients 91.3% (n= 368). Pleural effusion was the most common extra-pulmonary manifestation of tuberculosis i.e. 10.3% (n= 44). In our study majority were new cases 95.3% (n= 406). HIV screening test was negative in most of patients 99.5% (n= 424).









Discussion

Tuberculosis and HIV when present together pose an immense challenge for clinician and patient, in terms of drugs treatment interactions and side effects. In HIV, risk of TB is multiplied by 20 to 40 times. Lifetime risk of TB after HIV infection is approximately 10%.[5] The diagnosis of HIV in TB is paramount as it changes the management and prognosis.

According to data published by Pakistan Chest Society, there were total 366061 cases reported in Pakistan in 2016, out of which new and relapse cases were 356390 and 8091 respectively.[5] Annual death rate from tuberculosis is 24 per 100,000 population.[5]

Centre of Disease Excellence recommends screening of each patient who is diagnosed with TB for HIV, unless the patient refuses.[6] Considering in mind the above facts and figures, present study was performed to evaluate the HIV status in female population and its cost effectiveness of screening as the prevalence of HIV in female patients is very low. In our study vast majority of patients were screened negative for HIV. Only two patients had equivocal testing and when ELISA was performed, they were also negative.

Our study data is very much comparable to Hasnain J. et al study, that showed prevalence of 0.03%.7 This figure is very low when compared to WHO figures which showed over all prevalence of 12%.[3] The probable explanation for this is HIV clustered in areas in Pakistan. According to Health Services academy Islamabad, city of Faisalabad had a highest prevalence of HIV in Punjab.8 In Pakistan, male-to-female ratio in HIV-positive patients is 10:1.[7] The main reason for this difference is "sex behavior". Sexual promiscuity has been reported uncommon among female population as compared with male population in Pakistan.[9,10] Even in male who are HIV positive, most of them has a history of travel abroad or they are working in foreign countries.[11] As most of the females are housewives or lives mostly indoors, that is another reason for such a low incidence of HIV among tuberculous patients.

About one percent of patients who are diagnosed incidentally with HIV during routine tuberculosis follow up/ treatment as per WHO. This is the data from endemic areas with high prevalence of HIV.[12] In those areas missing these patients, effects will be catastrophic. There will be high likely hood of poor response, delayed response, increase chances of complications and converting into MDR or XDR tuberculosis.[12] Thus, based on this WHO has advised for screening for all the patients who presents with diagnosis of TB.[15]

Our study has questioned the above approach as adopted by WHO and other agencies. The reasons behind that are

1. None of our female patients were positive for HIV.
2. Pakistan has low burden of HIV.
3. Most of the females are sexually not active, confined to indoors, less frequent traveler and little or no extra marital sex life. This protects them from getting HIV.
4. The average test cost of HIV by screening costs about 300 rupees. This figure rises to 2200 rupees if done by ELISA and 9500 rupees for PCR.[14]

Pakistan is a developing country with slow economic growth. Keeping this mind, it is justifiable to rethink the policy of screening for HIV in each female patient. What we suggest that we should try for find out the clusters of female population that are more prone for HIV and then screen them thoroughly. These clusters are female sexual workers, spouses of male IV drug abuser and spouses of male HIV-positive patients.

Our study has short comings. First the sample size is not large enough to draw the conclusion adequately. Larger study with different female group populations is required to confirm this finding. Second short coming is that the gold standard to diagnose HIV is by real time PCR. In our study we used the kit method which has less sensitivity and specificity as compared to PCR. We suggest that real time PCR should be used in study to confirm or negate our recommendation.

Conclusion

This study high light the fact that HIV is less prevalent in our country and in the female population it is almost negligible. Since, it is low burden country, screening here for female population is not beneficial. Instead it raises the cost of diagnosis of tuberculosis. We recommend the screening only of high-risk female population for HIV, when they are suffered with TB as well.

1. www.avert.org/global-hiv-and-aids-statistics (May 2019)
2. Giri PA, Deshpande JD, Phalke DB. Prevalence of Pulmonary Tuberculosis Among HIV Positive Patients Attending Antiretroviral Therapy Clinic. N Am J Med Sci. 2013 Jun;5(6):367-70
3. UNAIDS Data Book 2017, www.unaids.org/en/resources/documents/2017/2017_data_book (May 2019).
4. www.nacp.gov.pk (May 2019)
5. Pakistan Chest Society Tuberculosis Guideline 2017
6. Recommendations for Human Immunodeficiency Virus Screening in Tuberculosis Clinics, www.cdc.gov/tb/publications/factsheets/testing/hivscreening.htm (May 2019).
7. Hasnain J, Memon GN, Memon A, et al. Screening for HIV among tuberculosis patients: a cross-sectional study in Sindh, Pakistan. BMJ Open. 2012;2(5).
8. 7th Annual Public Health Conference 2016 at Health Services Academy, www.hsa.edu.pk/p=3625 (May 2019)
9. Li N, Boulay M. Individual, familial and extra-familial factors associated with premarital sex among Bangladeshi male adolescents. Sex Health 2010;7:471–7.
10. Bradby H, Williams R. Behaviours and expectations in relation to sexual intercourse among 18–20 years old Asians and non-Asians. Sex Transm Inf 1999;75:162–7
11. Shah SA, Khan OA, Kristensen S, et al. HIV-

infected workers deported from the Gulf States: impact on Southern Pakistan. Int J STD AIDS 1999;10:812–14.

12. World Health Organization . Global tuberculosis report. WHO/HTM/TB/2012.6. WHO; Geneva, Switzerland: 2012
13. Extensively drug-resistant tuberculosis as a cause of death in patients co-infected with tuberculosis and HIV in a rural area of South Africa. Gandhi NR, Moll A et al, Lancet. 2006 Nov 4; 368(9547):1575-80
14. Chughtailab.com/test-menu (May 2019)
15. World Health Organization TB HIV fact sheet 2016