# PREVALENCE OF HIV AMONG TUBERCULOSIS OUT PATIENT ATTENDEES

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## ABSTRACT

**Background :** An estimated 2.47 million (2.0-3.1 million) people were living with HIV/AIDS in India by the end of 2006. Among those HIV infected individuals, TB was the commonest opportunistic infection and leading cause of mortality. HIV infection makes a person susceptible to both pulmonary and extra pulmonary forms of TB. Various studies have documented the occurrence of TB from 46 to 65 percent. However, provision of HIV screening services for Tuberculosis out patient attendees is limited at present.

**Aims :** To study feasibility of counseling for HIV screening and document the prevalence of HIV among TB out patient attendees.

**Methods :** This prospective explorative study included persons who sought TB screening at TB unit, Madurai from Jan 2003- Feb 2004. An interview schedule was developed to obtain information on socio-demographic profile, risk behavior profile and test results. Information collected includes socio-demographic profile, risk behavior profile and reaction to test results. Univariata and bivariate analyses were performed using Epi-info 6.04 (CDC, Atlanta, GA, July 1996). Chi-square test, student "t" test and one way ANOVA tests were performed to establish statistical significance between dependent and independent variables

**Results :** This study has found 57.66% chest symptomatic attending TB out patient ward were HIV positive. An analysis of risk profile versus positive results showed that 47(n=75) and 48(n=90) who admitted and denied high-risk behavior respectively, found to be positive to HIV screening test.

**Conclusion :** The researchers suggest that HIV counseling and testing services can be offered to all chest symptomatic attending TB out patient ward. This structural change will make HIV screening more effective and beneficial to patient community by ensuring early detection HIV infection.

## BACKGROUND

One third of the world's population is infected with *M. tuberculosis* and 75% of infected are in developing countries. A WHO review on analysis of the case notifications and overall tuberculosis situation and trend in the world shows that approximately one third of the world's population is infected with *M. tuberculosis*. In the past decades, an average of 2.5 to 3.2 million cases were notified every year globally.[1] The small decrease in notification rates in recent years being offset by population growth. Young people are disproportionately affected by HIV/AIDS due to the risk behavior practiced by this segment of population. Around half of the new infections are in people aged 15-24 years, the range in which most people start their

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sexual activity. Globally 50% of new infections are in women. Low literacy may also limit access to written, risk reduction information. In certain instances drug and/or alcohol abuse may impair judgment and limit the ability to practice safer sex.[2]

According to reports, in India almost 1.5 million people with TB were attending the Primary Health Institutes (PHI) and about one third of the TB burden is borne by the urban conglomeration. As a result about 4 lakh people die of TB every year.[3]

This is feared to increase in geometrical progression in the years to come, owing to growing epidemic of Human Immuno-deficiency Virus (HIV) infection. Even in developed countries where TB once considered to be totally eradicated, recorded a sudden high incidence rate. This renewed global interest in TB in the wake of emergence of HIV has led to a re-examination and refinement of current approaches to its control by international and national organizations.

HIV infection is generally a slowly progressive disease in which the virus is present throughout the body at all stages of the disease and weakens the body immune system and opens up for various infections. India ranks highest among the nations contributing to the global burden of Tuberculosis (TB). Disease burden and depleting immune systems makes an HIV infected individual an easy target for TB infection. Among estimated 2.47 million people living with HIV/AIDS in India, TB is the most common opportunistic infection [4,5] and leading cause of mortality.[6] HIV infection makes an infected person more susceptible to both pulmonary and extra pulmonary forms of TB. Various studies have documented the occurrence of TB among HIV infected patients ranged from 46 to 65 percent. [7,8,9,10,11,12]

With the introduction of Revised National Tuberculosis Control Programme (RNTCP) in 1997, 70% case detection and cure rate of 8 out of 10 TB patients has been achieved over a period of time.

Though HIV counseling and testing services were started in India in the year 1997, provision of HIV screening for TB out patients is limited. An integrated counseling and testing centre is a place where a person is counseled and tested for HIV, on his own free will or as advised by a medical provider. The main functions of an ICTC include:

1. Early detection of HIV.
2. Provision of basic information on modes of transmission and prevention of HIV/AIDS for promoting behavioral change and reducing vulnerability.
3. Link people with other HIV prevention, care and treatment services

Currently more than 4000 Integrated Counseling and Testing Centres (ICTCs), which are mainly located in government hospitals.[13]

Therefore the researchers have conducted this study to find out the feasibility of counseling TB symptomatics for HIV screening and document the prevalence of HIV among TB out patient attendees.

## MATERIALS AND METHODS

This prospective explorative study was carried out at Govt. Rajaji Hospital, Madurai. Pre-test counseling was offered to chest symptomatics and then screened for HIV. Blood for rapid test was drawn only after obtaining written informed consent.

## DATA COLLECTION

A semi structured interview schedule was developed and filled by direct questioning by the researchers after obtaining informed consent. Information collected include socio-demographic profile, risk behavior profile, reactions to test results.

This prospective explorative study included persons who sought TB screening at TB unit, Madurai from Jan 2003 - Feb 2004. Chest symptomatics aged 15

years & above, who attended for TB screening at TB out patient ward, Govt Rajaji Hospital Madurai, were met by the professional social worker. Professional social worker offered pre-test counseling and obtained informed written consent. All those who gave their consent were included for the study. Chest symptomatics who were 1) too old 2) too moribund, 3) mentally ill and 4) unwilling to give consent were excluded from the study. A Proforma in the form of an interview schedule with closed-ended questions was developed and filled by direct questioning by the interviewers. The interview schedule was pre-tested prior to administration. Subsequently the interview, which lasted for 15-20 minutes, was held after getting informed consent from the chest symptomatic.

## DATA ANALYSIS

Data collected includes socio-demographic profile, risk behavior profile and test results. Thus obtained data were edited and entered in Excel software. Further data cleaning and recoding was done in order to perform meaningful statistical analysis. Using Epi-info 6.04 (CDC, Atlanta, GA, July 1996), Univariate, Bivariate analyses were performed for interpretation. In order to observe statistical significance chi-square test, student "t" test and one way ANOVA were performed. Maximum likelihood ratio, odds ratio at 95% confidence intervals were used for bivariate analysis and interpretation.

## RESULTS

Socio demographic characteristics such as age, sex, marital status, occupation, education are given table-1. A total of 167 (107 male, 60 Female) respondents were interviewed, before and after undergoing HIV screening test. One third of male respondents belonged to 31-45 years age group. Half of male respondents and one fourth of female respondents were married. One fourth of male respondents were educated upto high school level and while one tenth of female respondents were illiterate. Sixty two percent of male respondents and 17.4% of female respondents were employed. Mean income of the respondents was INR 1628 with Standard deviation of 102.98. Mean income of women respondents was far less than men's income (Mean INR 868 SD 561). Chi-square test results were statistically significant between the variables such as sex, marital status, education and employment status of the respondents as p -.000.

## RISK PROFILE

Risk profile was collected for all the respondents. More than two third of men and one fourth of women respondents had reported pre marital and extra marital relationships (p=0.000). Respondents aged 30 years and above had reported higher incidence of extra and/or premarital contacts. Three fourth of employed respondents have reported extra and/or premarital contacts.

An analysis of risk profile showed that among those who have admitted high risk behavior 46 (n= 75) were sero-positive. Whereas 49 persons (n=92) who denied high risk behavior, found to be reactive to Rapid test.

Categorizations of risk behavior reveal that 15 persons had contact with neighbor and family women. Another 19 had extra marital contacts and contacts with CSW. Both skilled and unskilled labourers were prone to have equal chances of high risk behavior. Persons engaged in farming activities had third highest level of high risk behavior.[14]

An analysis of reactions versus results showed that, about 15 persons initially refused to accept the results and blamed their spouses for their HIV status. Equal number of respondent readily accepted the rapid test results. Another 34 respondents had experienced fear of death and fear of getting identified a feelings associated with shame. Five respondents felt extremely guilty and three respondents had attempted suicide.

**Table 1: Socio demographic profile of the respondents**

| | | Male | | Female | | Total | | Chi-Square | df | p-Value |
|---|---|---|---|---|---|---|---|---|---|---|
| Sex | | 107 | 64.1% | 60 | 35.9% | 167 | 100% | 13.228 | 1 | .000 |
| | | Count | Table % | Count | Table % | Count | Table % | | | |
| Age | 15-30 yrs. | 36 | 21.6% | 36 | 21.6% | 72 | 43.1% | 36.371 | 2 | .000 |
| | 31-45 yrs. | 56 | 33.5% | 20 | 12.0% | 76 | 45.5% | | | |
| | 46-60 yrs. | 15 | 9.0% | 4 | 2.4% | 19 | 11.4% | | | |
| | Total | 107 | 64.1% | 60 | 35.9% | 167 | 100.0% | | | |
| Marital status | Single | 20 | 12.0% | | | 20 | 12.0% | 308.240 | 4 | .000 |
| | Married | 84 | 50.3% | 39 | 23.4% | 123 | 73.7% | | | |
| | Separated | 3 | 1.8% | 1 | .6% | 4 | 2.4% | | | |
| | Divorced | | | 2 | 1.2% | 2 | 1.2% | | | |
| | Widowed | | | 18 | 10.8% | 18 | 10.8% | | | |
| | Total | 107 | 64.1% | 60 | 35.9% | 167 | 100.0% | | | |
| Education | Illiterate | 27 | 16.2% | 22 | 13.2% | 49 | 29.3% | 71.473 | 4 | .000 |
| | Primary Education | 34 | 20.4% | 16 | 9.6% | 50 | 29.9% | | | |
| | Secondary Education | 5 | 3.0% | 7 | 4.2% | 12 | 7.2% | | | |
| | High School | 40 | 24.0% | 14 | 8.4% | 54 | 32.3% | | | |
| | College Education | 1 | .6% | 1 | .6% | 2 | 1.2% | | | |
| | Total | 107 | 64.1% | 60 | 35.9% | 167 | 100.0% | | | |
| Employment status | Yes | 105 | 62.9% | 29 | 17.4% | 134 | 80.2% | 61.084 | 1 | .000 |
| | No | 2 | 1.2% | 31 | 18.6% | 33 | 19.8% | | | |
| | Total | 107 | 64.1% | 60 | 35.9% | 167 | 100.0% | | | |
| Income | | Mean | SD | Mean | SD | Mean | SD | | | |
| | | 1840 | SD 1036 | 868 | 561 | 1628 | 1032.98 | | | |

**Table 2: Demographic variables versus High Risk Behavior**

| | HRB | N | Mean | Std. Deviation | Std. Error Mean | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| Sex | Yes | 74 | 1.11 | .313 | .036 | -6.698 | 162 | .000 |
| | No | 90 | 1.56 | .500 | .053 | | | |
| Age | Yes | 74 | 2.77 | .673 | .078 | 1.516 | 162 | .131 |
| | No | 90 | 2.61 | .665 | .070 | | | |
| Marriage | Yes | 74 | 1.97 | .702 | .082 | -3.187 | 162 | .002 |
| | No | 90 | 2.49 | 1.238 | .131 | | | |
| Education | Yes | 74 | 2.45 | 1.315 | .153 | -.217 | 162 | .828 |
| | No | 90 | 2.49 | 1.211 | .128 | | | |
| Employment | Yes | 74 | 1.05 | .228 | .026 | -4.341 | 162 | .000 |
| | No | 90 | 1.31 | .466 | .049 | | | |
| Income | Yes | 69 | 1678.26 | 960.678 | 115.652 | .510 | 129 | .611 |
| | No | 62 | 1585.48 | 1119.111 | 142.127 | | | |

## SEROPOSITIVITY

Table-3 presents the sero positivity rate among respondents against socio-demographic variables. Among the subjects screened, 50 males and 45 females had reactive rapid test - a positivity rate of 56.83%. F–test produced results (F value-14.106,p-value.000) shows that positivity rate was statistically significant.

An analysis of risk profile showed that among those who had admitted high risk behavior, 46 (n= 75) were found reactive to Rapid test whereas 49 persons (n= 92) who denied high risk behavior, were found to be reactive to Rapid test.

Occupational distribution of respondents reveals that there was an even distribution of positive test results among both skilled (23) and unskilled laborers (24). Second highest number of positive test results was found among housewife (22).

Respondents within the age group of 31-45 had higher number of positive test results i.e., 27.3% (n= 75). Next higher prevalence rate was found among persons in the age group of 15 to 30 years (26.1%). Persons in 45– 60 years age group had fewer chances of getting infected with HIV.

Married men and women (40%) respondents had reported higher percentage of sero- positive results. Educational attainment had no influence in the seropositivity as it was evenly distributed among respondents with different levels of education as, 20.6% of illiterate, 15.8% of primary education and 15.8% with high school education respondents were found to be positive to rapid test. Employment related travel and economical independence have had some impact on the seropositivity (n=72).

## Table 3: Demographic variables versus sero-positive

| Demographic Factors | | Positive | | Negative | | Total | |
|---|---|---|---|---|---|---|---|
| | | Count | Table % | Count | Table % | Count | Table % |
| Sex | Male | 50 | 30.3% | 56 | 33.9% | 106 | 64.2% |
| | Female | 45 | 27.3% | 14 | 8.5% | 59 | 35.8% |
| | Total | 95 | 57.6% | 70 | 42.4% | 165 | 100.0% |
| Age | 16-30 years | 43 | 26.1% | 28 | 17.0% | 71 | 43.0% |
| | 31-45years | 45 | 27.3% | 30 | 18.2% | 75 | 45.5% |
| | 46-60years | 7 | 4.2% | 12 | 7.3% | 19 | 11.5% |
| | Total | 95 | 57.6% | 70 | 42.4% | 165 | 100.0% |
| Marital Status | Single | 7 | 4.2% | 13 | 7.9% | 20 | 12.1% |
| | Married | 66 | 40.0% | 56 | 33.9% | 122 | 73.9% |
| | Separated | 3 | 1.8% | 1 | .6% | 4 | 2.4% |
| | Divorced | 2 | 1.2% | | | 2 | 1.2% |
| | Widowed | 17 | 10.3% | | | 17 | 10.3% |
| | Total | 95 | 57.6% | 70 | 42.4% | 165 | 100.0% |
| Education | Illiterate | 34 | 20.6% | 14 | 8.5% | 48 | 29.1% |
| | Primary | 26 | 15.8% | 23 | 13.9% | 49 | 29.7% |
| | Secondary | 8 | 4.8% | 4 | 2.4% | 12 | 7.3% |
| | High School | 26 | 15.8% | 28 | 17.0% | 54 | 32.7% |
| | College | 1 | .6% | 1 | .6% | 2 | 1.2% |
| | Total | 95 | 57.6% | 70 | 42.4% | 165 | 100.0% |
| Occupational status | Yes | 72 | 43.6% | 60 | 36.4% | 132 | 80.0% |
| | No | 23 | 13.9% | 10 | 6.1% | 33 | 20.0% |
| | Total | 95 | 57.6% | 70 | 42.4% | 165 | 100.0% |

* 57.66% sero-positivity rate

## Table 4: High risk behavior, nature of high-risk behavior versus rapid test result

| | | Rapid test result | | | F | p-Value |
|---|---|---|---|---|---|---|
| | | Positive | Negative | Total | | |
| High Risk Behaviour | Yes | 47 | 28 | 75 | 1.454 | 0.230 |
| | No | 48 | 42 | 90 | | |
| | Total | 95 | 70 | 165 | | |

| Kind of High Risk Behavior | HIV RESULT | | |
|---|---|---|---|
| | Positive | Negative | Total |
| EMR with neighbor and family women | 15 | 12 | 27 |
| EMR with CSW | 20 | 14 | 34 |
| EMR with co workers | 6 | 1 | 7 |
| EMR with family members | 3 | 1 | 4 |
| Not Reported | 51 | 42 | 93 |
| Total | 95 | 70 | 165 |

*EMR-Extra marital relationship

**Table 5: Associated reasons for HIV screening and rapid results**

| | | Rapid result | | | F | Sig. |
|---|---|---|---|---|---|---|
| | | Positive | Negative | Total | | |
| Reasons | Dr Referral | | 1 | 1 | 8.487 | .004 |
| | Due to sickness | 49 | 52 | 101 | | |
| | Sex with Multi-partners | 5 | 4 | 9 | | |
| | Others | 27 | 9 | 36 | | |
| | Total | 81 | 66 | 147 | | |

**Table 6: High-risk behavior against background characteristics**

| Demographic Factors | | Yes | | No | | Total | |
|---|---|---|---|---|---|---|---|
| | | Count | Table % | Count | Table % | Count | Table % |
| Sex | Male | 66 | 40.2% | 40 | 24.4% | 106 | 64.6% |
| | Female | 8 | 4.9% | 50 | 30.5% | 58 | 35.4% |
| | Total | 74 | 45.1% | 90 | 54.9% | 164 | 100.0% |
| Age | 16-30 years | 27 | 16.5% | 44 | 26.8% | 71 | 43.3% |
| | 31-45years | 37 | 22.6% | 37 | 22.6% | 74 | 45.1% |
| | 46-60years | 10 | 6.1% | 9 | 5.5% | 19 | 11.6% |
| | Total | 74 | 45.1% | 90 | 54.9% | 164 | 100.0% |
| Marital Status | Single | 12 | 7.3% | 8 | 4.9% | 20 | 12.2% |
| | Married | 57 | 34.8% | 63 | 38.4% | 120 | 73.2% |
| | Separated | 2 | 1.2% | 2 | 1.2% | 4 | 2.4% |
| | Divorced | 1 | .6% | 1 | .6% | 2 | 1.2% |
| | Widowed | 2 | 1.2% | 16 | 9.8% | 18 | 11.0% |
| | Total | 74 | 45.1% | 90 | 54.9% | 164 | 100.0% |
| Education | Illiterate | 25 | 15.2% | 23 | 14.0% | 48 | 29.3% |
| | Primary | 19 | 11.6% | 30 | 18.3% | 49 | 29.9% |
| | Secondary | 3 | 1.8% | 8 | 4.9% | 11 | 6.7% |
| | High School | 26 | 15.9% | 28 | 17.1% | 54 | 32.9% |
| | College | 1 | .6% | 1 | .6% | 2 | 1.2% |
| | Total | 74 | 45.1% | 90 | 54.9% | 164 | 100.0% |
| Occupational status | Yes | 70 | 42.7% | 62 | 37.8% | 132 | 80.5% |
| | No | 4 | 2.4% | 28 | 17.1% | 32 | 19.5% |
| | Total | 74 | 45.1% | 90 | 54.9% | 164 | 100.0% |

## DISCUSSION

This study clearly shows that more than half of chest symptomatics attending TB out patient ward were seropositive. Previous studies looked at the occurrence of TB among HIV infected individuals. On contrary, this study has documented the prevalence of HIV among chest symptomatics.

Screening for HIV brings enormous psychological suffering and emotional disturbances. The present study also revealed that denial seems to be very high among those with reactive rapid test results. High-risk behavior was common among both skilled and unskilled labourers. Study results also showed higher incidence of the positive test results among females compared to men. In high income countries, the risk of female-to-male transmission is 0.04% per act and male-to-female transmission is 0.08% per act. For various reasons, lack of privacy,unhgienic sexual practice etc., HIV transmission rates are 4 to 10 times higher in low income countries.[7]

Another important point to be kept in mind is window period. Twenty nine respondents who admitted high risk behavior were negative to rapid test perhaps due to window period. Under these circumstances post test counseling could play an important role in early detection of HIV for further management. Similarly, gap between high risk behavior and negative test results need to be probed further.

Comparative analysis has shown that the rate of positivity is quite high among persons involved in business because of the fact that out of 6 screened 5 were positive. Therefore preventive education should be directed more towards people involved in businesses. Educational status of the respondents found positive to rapid test reveal high prevalence of HIV among those who had illiteracy or primary education. This study has brought out a penetrative need for directing the preventive education to the illiterates.

There is evidence to show that level of general awareness towards HIV/AIDS has increased in the population. However, knowledge and utilization about various services available for prevention, counseling, testing, care and treatment is low. This has resulted in sub-optimal utilization of various services. Counseling and testing services are an important components of prevention and control of HIV/AIDS in the country. Hence, the availability of their services should be popularised among public.

Therefore, to control the TB epidemic and emergence of MDR TB, issue of high prevalence rate of HIV among TB out patient attendees or chest symptomatics need to be dealt seriously. Provision of HIV screening services to all TB out patient attendees could ensure early screening and detection of HIV infection among chest symptomatics.

The present Voluntary Counseling and Testing Centers (VCTC) are recently termed as integrated counseling and testing centers (ICTC). The researchers, suggest that ICTC should be placed alongside TB out patient ward. This structural change will make HIV screening more effective and beneficial to patient community by ensuring early detection HIV infection.

The limitation of this study is that the persons with other High Risk Behavious like homosexuals, bisexuals, Men who have Sex with Men etc. were not studied. Study was carried out in a govt. setting where people belonging to lower socio economic strata tend to attend more. Under this situation it is difficult to judge the prevalence of HIV among persons belonging to higher economic strata and those seeking private health care. These results would vary among well educated persons belonging to high income groups. Due to shortage of time and money a large number of patients could not be covered. Therefore the researchers are of the opinion that, large sample, could have given much better results.

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