Internal Medicine Section

TB-DOTS Outcome in Relation to HIV Status: Experience in a Medical College

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ABSTRACT

Background and Objective: There is scarce information regarding TB associated with Human Immunodeficiency Virus (HIV) infection treated under routine program conditions in medical colleges of India. This study evaluates the clinical profile and outcome of TB-DOTS treatment by HIV status.

Methods: Total two hundred and eighty TB patients registered under Revised National Tuberculosis Control Program Revised National TB Control Program (RNTCP) during January 2011 and December 2012 in a teaching hospital of South India were enrolled in the study. The demographic profile, treatment related data of these patients was obtained from RNTCP treatment card and the DOTS outcome of all enrolled cases depending on their HIV status was evaluated. Data was analysed using descriptive statistics and chi-square test.

Results: Among 280 TB patients enrolled 41 were HIV positive patients and 239 HIV negative. About 21% patients were retreatment patients. Over all, pulmonary TB was still the commonest form of TB among the registered patients. However, Extra Pulmonary (EPTB) was high among HIV positive TB patients. Treatment success among HIV positive TB patients was lower than HIV negative TB patients (61% vs. 79%). Further, 19.5% HIV positive and 8.3% HIV negative patients died. The proportions of defaulters and failures were similar in HIV positive and HIV negative patients.

Conclusion: HIV co-infected TB patients responded poorly to DOTS as evidenced by lower success rates and higher mortality than HIV negative TB patients. A significant proportion of retreatment patients in our study is the matter of concern.

INTRODUCTION

The worldwide spread of HIV infection has undermined human defence against *Mycobacterium tuberculosis (Mtb)*. HIV infection is the strongest risk factor for the progression of latent *Mtb* infection to active disease [1,2]. People living with HIV who are also infected with TB are much more likely to develop TB disease than those who are HIV negative [3].

HIV infection is also associated with unusual clinical presentations of TB, increase in extra-pulmonary and acid-fast bacilli (AFB) smear negative pulmonary disease, and atypical findings on chest radiography, all making the diagnosis of HIV associated TB problematic [4].

RNTCP in India uses a fully intermittent thrice weekly rifampicin containing regimen for all TB patients including those who are HIV infected [5].

The treatment success in TB patients is a major challenge in TB programmes, which is influenced by number of factors including HIV co-infection [6]. The mortality rate from HIV associated TB in developing countries is high, it is due to failure of anti TB treatment or complications of HIV [7]. Yet, there is limited information on impact of HIV co-infection on TB treatment outcome from a Directly Observed Treatment Short Course (DOTS) centre of a medical college. This study was conducted to evaluate the clinical profile and outcome of DOTS in relation to HIV status.

MATERIALS AND METHODS

This prospective observational study was conducted at a tertiary care teaching hospital of South India. A total of 280 patients registered under RNTCP during January 2011 and December 2012 were enrolled in the study. The study group comprised of 41 HIV positive and 239 HIV negative patients and informed consent was taken from all the patients. All the enrolled patients were treated

following RNTCP guidelines and followed up for 6-8 months and those HIV co-infected TB patients were treated at Anti Retroviral Therapy (ART) centre of the hospital as per National AIDS Control Program (NACO) guidelines. The demographic profile, type of TB, HIV status, treatment outcome of DOTS at the end of the treatment was recorded from TB treatment card. All enrolled patients were stratified depending on various age groups, gender, type of TB and HIV status. Treatment outcomes of all the cases were in accordance with RNTCP definitions and classified as cured, treatment success, defaulters, treatment failure and deaths. Data was analysed to evaluate various types of TB and the outcome of DOTS in relation to HIV status of the enrolled cases

STATISTICAL ANALYSIS

Data was entered into Microsoft excel and analysis was done using Graph pad Instat statistical software. Descriptive statistics was used for calculating proportions. The Chi-square test or alternatively Fisher's Exact test was used to determine if there were associations between categorical variables. All tests were evaluated at a significance level of 0.05

RESULTS

Among 280 TB patients included during the period of study, 41 (14.6%) were HIV positive and 239 (85.4%) were HIV negative. Their demographic characteristics are given in [Table/Fig-1]. Majority of the patients were males in the age group 15-44 years.

About 24.4% HIV positive and 20.5% HIV negative were retreatment patients. EPTB was higher among HIV positive (48.7%) as compared to HIV negative patients. [Table/Fig-1]. Lymph node involvement was most common in both HIV positive and negative patients (45% and 49%) [Table/Fig-2]. Over all smear positivity was lower in HIV positive as compared to HIV negative patients (61.9% vs 71.8%) [Table/Fig-1].

Characteristics	Total (n)	%	HIV Positive (n)	%	HIV Negative (n)	%
Overall	280		41	14.6	239	85.4
Gender						
Male	182	65	28	68.3	154	64.4
Female	98	35	13	31.7	85	35.6
Age at registration						
<14	18	6.4	1	2.4	17	7.1
15-29	87	31.1	5	12.2	82	34.4
30-44	93	33.2	22	53.7	71	29.7
45-59	55	19.6	12	29.3	43	17.9
>60	27	9.7	1	2.4	26	10.9
Type of TB						
New cases						
New smear positive	93	42.1	9	29.1	84	44.2
New smear negative	48	21.7	6	19.3	42	22.1
Extrapulmonary	80	36.2	16	51.6	64	33.7
Re-treatment cases						
Smear positive	45	76.3	4	40	41	83.7
Smear negative	9	15.3	2	20	7	14.3
EPTB	5	8.4	4	40	1	2
Overall Type of TB						
Overall pulmonary	195	69.6	21	51.2	174	72.8
Overall extrapulmonary	85	30.4	20	48.7	65	27.2
Treatment outcome						
Treatment Success	214	76.4	25	60.98	189	79.1
Cured	89	64.49	7	53.8	82	66.6
Died	28	10	8	19.5	20	8.3
Default	20	7.14	3	7.3	17	7.1
Failure	15	5.36	2	4.8	13	5.4

[Table/Fig-1]: Baseline characteristics and treatment outcome of all registered TB cases by HIV status

[Table/Fig-2]: Type and form of TB in relation to HIV status

The lower treatment success rate and higher death rate observed in HIV positive compared to HIV negative patients was not statistically significant (p>0.05). But, the treatment outcome by smear status showed significant results (p<0.05) [Table/Fig-3].
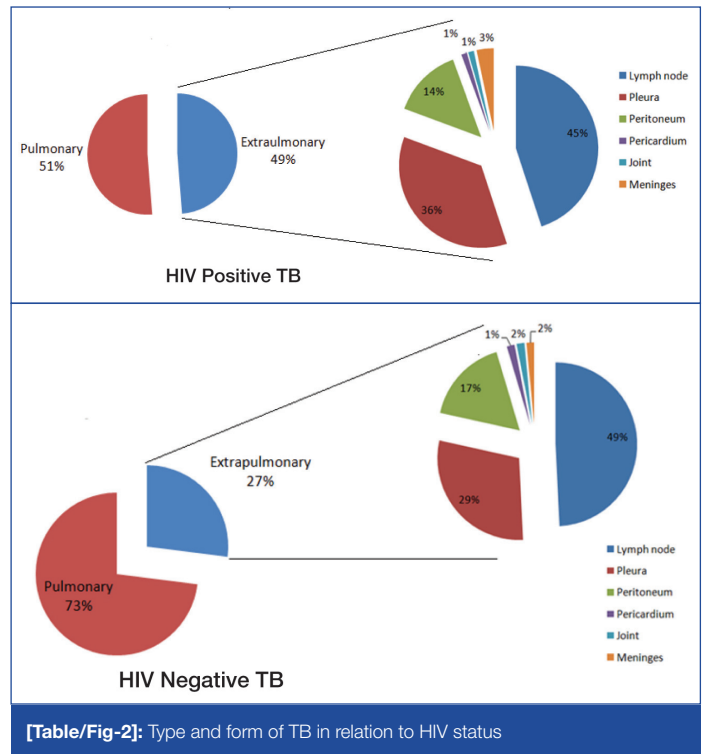
DISCUSSION

Our study evaluated the clinical profile and treatment outcome of DOTS by HIV status of patients. This study reports a maximum prevalence of HIV-TB co-infection in the economically productive age group of 15-44 years with male preponderance which was also observed in earlier Indian studies [8,9].

The proportion of retreatment TB patients observed in the study was higher than the RNTCP norms. In HIV-infected patients, the risk of recurrent disease is higher, and previous work has demonstrated that this can be due to treatment failure, emergence of drug resistance during therapy or reinfection with a new strain of *Mtb* [10]. The reasons for higher proportions of retreatment cases among HIV negative patients need to be further evaluated.

In HIV positive TB patients pulmonary TB is the commonest form of TB [11]. Similar finding was observed in our study. The lower sputum positive detection rate and increasing frequency of EPTB (49%) in HIV positive patients might be due to unrecognized mycobacteremia in severely immunocompromised patients. The level of immunosuppression among HIV positive patients was not assessed in this study. Unrecognised TB in patients with HIV disease has far reaching consequences including delayed diagnosis, unacceptable therapeutic delay and even rapid progression to untreatable TB [8]. It has been observed that presence of a cough for more than three weeks is not sensitive enough on its own as a symptom of TB in HIV infected persons [12]. Mycobacterial culture is the gold standard for TB diagnosis and is now routinely recommended to assist the diagnosis of TB in HIV infected persons, although it is slow and costly [13].

The treatment success rate of all registered patients was lower than the RNTCP norms, district average [14] and national average for the corresponding year. The study revealed lower success rate among HIV positive compared to HIV negative TB patients (61% vs 79%) but, higher compared to other recent studies [15-17]. Lower success rate may be attributable to high mortality and default rate reported among HIV positive patients. The high mortality associated with HIV co-infected TB is also observed in several studies [9, 17] and closer to state average [3]. The reason for this could also be due to other opportunistic infections among HIV patients. Our analysis showed almost similar default and failure rates among HIV positive and HIV negative patients.

Treatment Outcome	n	HIV positive pulmonary TB		HIV negative pulmonary TB	
		Smear Positive n(%)	Smear Negative n(%)	Smear Positive n(%)	Smear Negative n(%)
Cured	89	7(53.84)	0	82(65.6)	0
Treatment completed	52	0	5(62.5)	0	47(96)
Death	22	3(23.07)	3(37.5)	14(11.2)	2(4)
Default	18	2(15.38)	0	16(12.8)	0
Failure	14	1(7.69)	0	13(10.4)	0
Total	195	13	8	125	49

[Table/Fig-3]: Treatment Outcome of Pulmonary TB Patients in Relation to Sputum Smear

Our results should be viewed in the light of certain limitations which was a single site study that may not be representative of the average standard of care in other resource limited areas. Using patient treatment card as a primary source may limit the accuracy of information. The potential factors like clinical manifestations, staging of HIV, occurrence of other opportunistic infections, duration of ART, which are likely to influence the outcome of DOTS, were not dealt with. The exact cause of death could not be ascertained. Despite these limitations, the study findings are useful to inform policy and programmes to improve management of TB/HIV in patients.

CONCLUSION

The study showed overall treatment success rate of DOTS was lower than RNTCP norms for the corresponding year irrespective of HIV status. The higher proportion of retreatment patients in study population is a matter of concern. The lower success rate among HIV positive patients compared to HIV negative TB patients observed might be due to atypical presentation, delayed diagnosis and drug resistant TB. The results of the study demonstrate that there is a need to strengthen the DOTS in our study area.

RECOMMENDATIONS

- Early diagnosis and access to faster diagnostic methods of TB in seropositive patients.

- Decentralization of ART centres like DOTS centre.

- Referral and linkage services should be improved and strengthened for enhanced treatment adherence.

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