

Socio-demographic and Clinical profile of HIV-TB co-infected adults and its association with tuberculosis treatment outcome, registered in various ART centres of Gujarat State

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Abstract

Background: World's top most deadly infectious diseases are HIV and TB. TB-HIV co-infection results in more mortality rates. India is at 2nd number in comparison of estimated HIV associated TB cases. **Objectives:** To know about HIV-TB co-infected patients' socio-demographic and clinical profiles and establish links between these factors and treatment outcome. **Methods:** A prospective observational study was carried out, from 1st July 2017 to 31st October 2018, on HIV-TB co-infected adults residing in 30 Talukas of Gujarat state, by interview method using a questionnaire. The selection of talukas was made by the cluster sampling method. **Results:** The majority of the 211 HIV-TB co-infected adults studied were males (74%) and belonging to age ranged 21-50 years, representing the most socioeconomically productive segment of the population. Most came from lower socio-economic stratum (78%), and the majority were educated only till primary school (60%). The majority of patients were presented with one symptom of 4s complex (Current cough, Fever, Weight loss and Night sweat) (83%). The most common adverse effects observed were gastrointestinal (62%). Patients having adverse effects had significantly poor outcomes ($p < 0.05$). **Conclusion:** TB-HIV co-infection was more common among males and the economically productive age groups. Approximately half of the patients experienced adverse effects during the treatment course, which were associated with poor treatment outcome

Keywords: HIV-TB co-infected, Socio-demographic profile, TB treatment outcome

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Introduction

The world's topmost deadly infectious diseases are HIV and TB. Worldwide, TB is the leading cause of death among people living with HIV[1]. TB-HIV co-infection results in more mortality rates. Around 25 per cent of all deaths among PLHIV are estimated to be due to TB[2]. TB occurs earlier in the course of HIV infection than other opportunistic infections[3]. The risk of having tuberculosis (TB) is estimated to be between 16-27 times greater in people living with HIV than among those without HIV infection[4]. The risk of death in co-infected individuals is twice that of HIV infected individuals without TB, even when antiretroviral (ARV) therapy is taken into account[3].

Globally, in 2018, 251,000 people who were co-infected with TB and HIV are estimated to have died. These deaths are in addition to the 1.2 million people who died from TB alone. India is at the second number (after South Africa) in comparison to estimated HIV associated TB cases[3]. Cases of HIV-infected people who go on to develop Tuberculosis (TB) is increasing in India, according to the India TB Report 2019. According to the 2019 report, amounting to a TB-HIV co-infection rate was 3.4 per cent in India which was 3 per cent in 2018[2]. This study was designed to obtain information about the socio-demographic and clinical profile of HIV-TB co-infected patients and to establish links, if any, between these factors and treatment outcomes.

Materials & Methods

Study sample size

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This prospective observational study was carried out on HIV-TB co-infected patients. Our sample size was 211. The sample size was calculated by cluster sampling. We selected 30 talukas of Gujarat state by cluster sampling.

After assessing exclusion criteria, all patients registered in various ART centres during the third quarter of 2017 (Jul - Sep) and the fourth quarter of 2017 (Oct-Dec) from these talukas were included in the study.

Study period

The study was carried out from July 2017 to October 2018

Inclusion criteria

HIV-TB co-infected patients who enrolled in the third quarter (Jul - Sep) of 2017 and fourth quarter (Oct-Dec) of 2017

Exclusion criteria

1. Patients with the age of below 15 years
2. Patients with drug resistance TB
3. Patients who were not willing to participate

Method of data collection

Data collection was started after obtaining clearance from the ethical committee of our institution. All study participants were communicated telephonically, and they were asked regarding socio-demographic profile, type of TB, adverse reactions, outcome etc.

All patients were asked every month from initiation of treatment up to the outcome of treatment. Data were analysed by Microsoft Excel 2010 and epi-info software.

Definitions

Type of TB patients as per RNTCP guidelines[5]

1. New patients: The TB patient has never had treatment with anti-TB drugs (ATT) or the TB patient who has taken the treatment

for less than one month.

2. Previously treated patients: A TB patient who has received one month or more of anti-TB treatment (ATT)

The outcome of TB treatment as per RNTCP guideline[5]

1. Cured: A TB patient who was microbiologically confirmed for TB at the beginning of treatment but who is smear or culture negative at the end of the complete treatment
2. Treatment completed: A TB patient who completed treatment without evidence of failure or clinical deterioration but with no record to show that the smear or culture results of biological specimen in the last month of treatment were negative, either because the test was not done or because the result is unavailable
3. Treatment success: TB patients either cured or treatment completed are accounted in treatment success

4. Failure: A TB patient whose biological specimen is positive by smear or culture at the end of treatment
5. Lost to follow up (LFU): ATB patient whose treatment was interrupted for one consecutive month or more
6. Died: A patient who has died during the course of anti-TB treatment

Result

Around (89%) of patients were between 21-50 years of age group, representing the most socioeconomically productive segment of the population. The majority of patients were male (74%), male to female ratio being 35 females per 100 males (1: 0.35). The majority of patients (60%) were educated up to the primary level. The socio-economic status of most (78%) was low. The majority of patients (74%) were residing more than 10 km away from ART centres. (Table 1)

Table 1. Socio-demographic characteristics of HIV-TB co-infected patients

Age group (in completed Years)	Frequency (n=211)	Percentage
11-20	6	2.84
21-30	50	23.69
31-40	86	40.75
41-50	51	24.17
51-60	8	3.79
61-70	7	3.31
71-80	3	1.42
Sex		
Male	156	73.93
Female	55	26.06
Education		
Illiterate	66	31.27
Primary	60	28.43
Secondary	69	32.7
Graduation & post-graduation	16	7.58
Socio-economic class (Modified Prasad classification)		
1	10	4.73
2	17	8.05
3	19	9.00
4	95	45.02
5	70	33.17
Total	211	100
Distance between residing area and ART centre		
<2 km	7	3.32
Up to 5 km	10	4.74
Up to 10 km	37	17.53
>10 km	157	74.43

Out of the total of 211 HIV –TB co-infected patients, (80%) were newly diagnosed with TB infection while (20%) of patients were previously treated. Most of the patients(83%) had one or more symptoms from 4s complex. The four symptoms complex includes Current cough, Fever, Weight loss and Night sweat, and it is used for TB screening among HIV patients[5]. Out of the total cases, 18% of cases had a history of Tuberculosis infection in their families. Adverse effects were present in 49% of the cases after starting anti-tubercular treatment (ATT). TB treatment success rate was 85.78%. Around 7% of patients have died. (Table 2)

Table 2. Clinical profile of HIV-TB co-infected patients

Type of cases	Frequency (n=211)	Percentage
New	168	79.62
Previously treated	43	20.37
Family history of TB		
Present	38	18.00
Absent	173	81.99
Any Symptom of 4s Complex		
Present	176	83.41
Absent	35	16.59
side effects after starting		

of Anti Tubercular Treatment		
Present	103	48.81
Absent	108	51.18
Other illness		
Present	15	7.1
Absent	196	92.89
Outcome		
Treatment success	181	85.78
Loss to follow up	9	4.27
Failure	6	2.84
Died	15	7.11

The most common adverse effects observed were Gastrointestinal(62%) followed by skin rashes(23%) and Jaundice(6%). Few other adverse effects observed were dimness in vision (3%), Oedema (2%) and mouth ulcers (4%). (Figure 1)

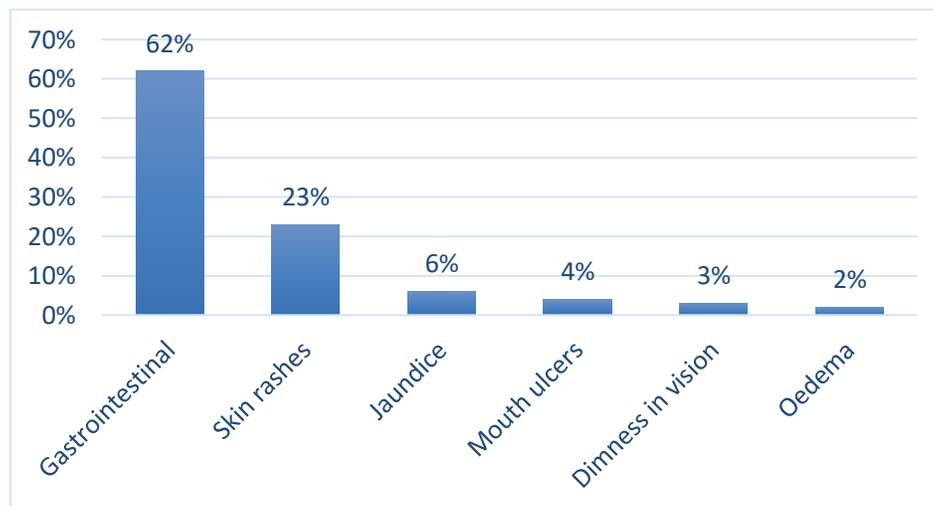


Fig 1: Distribution of cases having adverse effects with the treatment

The proportion of successful treatment was more among females than males and those aged less than 30 years than the older. The proportion of successful treatment was more among those who were educated above primary level, socio-economic class 1 & 2, those who reside in <10 km from ART centre. However, none of these differences was statistically significant ($p>0.05$). The treatment success rate was lower among those patients having side effects during treatment and, this difference was statistically significant ($p<0.05$). (Table 3)

Table 3. Association of socio-demographic and clinical factors with treatment outcome

		Dots outcome		
		Successful (%)	Unsuccessful (%)	
Gender	Male	132 (85%)	24 (15%)	Chi-square=0.66 $p>0.05$
	Female	49 (89%)	6 (11%)	
Age	<30 years (n=56)	51 (91%)	5 (9%)	Chi-square=1.74 $p>0.05$
	>30 years (n=155)	130 (84%)	25 (16%)	
Literacy	Upto primary level (n=126)	107 (85%)	19 (15%)	Chi-square=0.19 $p>0.05$
	Above primary level (n=85)	74 (87%)	11 (13%)	
Socio- economic Status	class 1 & 2 (n=27)	26 (96%)	1 (4%)	Chi-square=1.9 $p>0.05$
	class 3, 4 & 5 (n=184)	155 (84%)	29 (16%)	
Distance from ART Centre	< 10 km (n=54)	50 (93%)	4 (7%)	Chi-square=2.76
	> 10 km (n=157)	131 (83%)	26 (17%)	

				$p > 0.05$
Type of cases	New	142 (85%)	26 (15%)	Chi-square=1.07 $p > 0.05$
	Previously treated	39 (91%)	4 (9%)	
Side effects after starting of ATT	Present	79 (77%)	24 (23%)	Chi-square=13.6
	Absent	102 (94%)	06 (6%)	$p < 0.05$

Discussion

HIV-TB co-infected patients were mostly males, and the majority were in the 21-50 years of age group, representing the most socioeconomically productive segment of the population. Other studies also showed a similar trend. A study done by Ragini Ghiya et al.,[6] showed that the majority were males (68.7%) and in the 15-50 years of age group (82.5%). Another study done by Arunmohan M. V. et al.,[7] showed that males (73.5%) were more than females and most patients were in the 30-39 years of age group. More than two-thirds of patients were from lower socio-economic classes (4 & 5). Around 60% of patients were illiterate or educated up to the primary level. Only 8% of patients were graduated, or post graduated. These could be an essential factor to the current morbidity status (co-infection) of these patients as low educational status is a contributory factor for low awareness of the transmission of diseases and poorly ventilated housing conditions. Malnutrition is also a risk factor for TB infection. Similar findings were seen in a study done by Arun Mohan M. V. et al.,[7] where two-thirds of subjects belonged to low socio-economic status and were educated up to Middle- school.

The majority of TB cases were newly diagnosed (79.6%), while (20.4%) cases were previously treated. The study by Tiewsoh JB et al.,[8] showed that most patients were newly diagnosed with TB. Most of the patients (83%) had one or more symptoms from the 4s complex, which includes Current cough, Fever, Weight loss and Night sweat. 4 symptoms complex is used for TB screening among HIV patients as per national ART guideline[5].

Forty-nine per cent of cases felt adverse effects after starting ATT. The most common adverse effects observed were Gastrointestinal in 62%, followed by skin rashes in 23% of cases. The study done by Manisha Nagpal et al.,[9] showed that adverse effects were present in 44.4% of cases, and the most common adverse effects were gastrointestinal system related (63.9%) followed by fever and chills (28.8%).

There was no statistically significant association between observed clinical- demographic factors and TB treatment success rate. Although one variable (having side effects after starting ATT) showed a statistically significant association between TB treatment outcomes.

Conclusion

TB-HIV co-infection was more common among males as compared to females and the economically productive age groups. The majority of TB-HIV co-infection cases were belonging to a lower socio-economic class and were educated up to the primary level. Approximately 50% of patients experienced adverse effects during treatment, which were associated with poor treatment outcomes ($p < 0.05$). All HIV patients with the above-mentioned risk factors should be screened for TB, and

Conflict of Interest: Nil

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vice versa, all TB patients should be screened for HIV. Early diagnoses and prompt treatment can improve treatment outcomes in these patients.

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