ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 16, Issue 7, 2023

Online - 2455-3891
Print - 0974-2441

Research Article

TREATMENT OUTCOME OF CHEMOTHERAPY AND ANTIRETROVIRAL THERAPY AND COTRIMOXAZOLE PREVENTIVE THERAPY IN TUBERCULOSIS PATIENTS WITH HUMAN IMMUNODEFICIENCY VIRUS COINFECTION

GIRIJA SHANKAR UDGATA[1]*, SRIKANTA DASH[1], SARITA BEHERA[2], SASMITA MEHER[1], ANANYA UDGATA[3], HOTA S[4]

[1]Department of Pulmonary Medicine, BBMCH, Balangir, Odisha, India. [2]Department of Medicine, BBMCH, Balangir, Odisha, India. [3]Department of Pharmacology, BBMCH, Balangir, Odisha, India. [4]Department of Ophthalmology, BBMCH, Balangir, Odisha, India.
Email: girijaudgata777@gmail.com

Received: 04 March 2023, Revised and Accepted: 12 May 2023

ABSTRACT

Objective: In developing countries like India, the fatality rate of tuberculosis (TB) coinfected with human immunodeficiency virus (HIV) is still at high rate and imposes significant challenge among the physicians. The present study was conducted to evaluate management outcomes of combined antiretroviral therapy (ART) and chemotherapy or cotrimoxazole preventive therapy (CPT) in TB/HIV co-infected patients.

Methods: The study was conducted on 3512 confirmed TB patients who were treated with ART and CPT therapy. Out of these, HIV positive was 58 cases and HIV negative was 3414 cases. HIV cases the algorithm KHB- Statpak- Unigold were used. Patient started CPT.

Results: Percentage of TB and HIV coinfection was 58 and the coinfection was greater in 20–40-year age groups and 2 times higher in PTB sputum-positive cases. Among the extrapulmonary TB cases, 76% took CPT + ART. The treatment success was 86%.

Conclusion: Thus, CPT therapy must be established in all centers and compulsory HIV screening must be implicated throughout the country.

Keywords: Tuberculosis, Human immunodeficiency virus, Tuberculosis and human immunodeficiency virus coinfection, Antiretroviral therapy, Cotrimoxazole preventive therapy.

 DOI: http://dx.doi.org/10.22159/ajpcr.2023v16i7.48370. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

Tuberculosis (TB) and human immunodeficiency virus (HIV) coinfection exhibits as a chief community well-being hazard which occurs universally [1,2]. Globally, the prevalence rate was found to be more than one third of population existing with HIV (PLHIV) who seems to be infected with TB [2,3]. Among ten million cases infected with TB were observed in the year 2019, 8.2% has the coinfection of PLHIV [4]. Approximately 70% of PLHIV-infected cases were found to be prevalent among from sub-Saharan African countries [5]. In spite of the southeast Asian region (SEAR) goes through with 34% reduced TB incidence amid PLHIV in an 11-year period till 2013, high TB-HIV ailment problem was quiet perceived among Indonesia, Myanmar, Thailand, India, as well as Nepal [6]. To decrease the occurrence of TB ailment between PLHIV infections, 32% PLHIV registered for HIV care in SEAR countries established TB preventive therapy in 2019 [7]. In the year 2020, approximately 208,000 TB death cases have been perceived between PLHIV whereas in the year 2000, a reduced observation of roughly 678,000 TB death cases was observed [4].

As per the World Health Organization guidelines, a very high burden of TB has been documented whereas the infection with *Mycobacterium tuberculosis* positions leading amid opportunistic infections producing comorbidity with HIV infection [8]. The potentiating effect among HIV and TB was found to be fine recognized among various researches from Africa whereas the indication occurs progressively increasing between the regions of Asian and Pacific areas. Swift spread of HIV may lead to accumulative problem of TB. In India, burden approximately 2.5 million populations were found to be suffered with HIV. Between these cases, roughly 40% suffers because of this coinfection with TB [9]. There is wide difference in HIV seropositivity among TB cases in India, reaching from 9.4% reported in New Delhi whereas 30% documented in Mumbai [10]. In a resource-limited setting comparable India, this might have distant reaching significances [11].

Cases with TB-HIV without antiretroviral therapy (ART) incline to report lesser TB results when associated with persons who are on ART [12]. ART must not been deferred particularly amid MDR-TB cases through HIV coinfection [13]. A documented research revealed that the rate of ineffective MDR-TB therapy was found to be proportionally rising with the accumulative frequency of neglected hospital appointments [14]. TB infection with dawn exhibition and HIV investigation are additional risk issues for ineffective TB therapy outcomes between cases with TB-HIV [15]. Hence, the current work has been carried out to evaluate the management outcomes of combined ART and chemotherapy or cotrimoxazole preventive therapy (CPT).

METHODS

All diagnosed patients were receiving treatment for TB since January 2019 to January 2021 was included in the observation. The district Balangir comprises a population of 1,616,971 and with 17 CHC and 2 numbers of UG CHC. Most laboratory personnel were degree holder and in Government Job.

Diagnosis of PTB in Bhima Bhoi Medical College and Hospital, Balangir, was done clinically and by ZM microscopy. Biological specimen for identification of PTB was composed by spot-morning-spot sample gathering strategy. Extrapulmonary TB (EPTB) cases were identified by CBNATT, X-ray, ultrasound, and pathological techniques. The diagnosed cases were given 2EHRZ + 4 HRE. HIV cases the algorithm KHB- Statpak- Unigold were used. Patient started CPT. Once a HIV case diagnosed among TB cases, it was enlisted in HIV chronic care.

Inclusion criteria

Patient with thorough demographic and scientific data (regardless of age, groups, sex, types of TB, and HIV status) has been encompassed into this study. Patient whose record data were missing has been exempted from this study.

Study population

An overall of about 3512 patients who existed treated during the study period were included. Among these, microbiological confirmed case was 1668 and clinically diagnosed was 1844 and CBNATT-positive case was 3306. Out of 3512 cases, HIV positive was 58 cases and HIV negative was 3414 cases.

RESULTS

The demographics characteristics of the study populace are presented in Table 1.

Table 1: Demographic and tuberculosis profile among the patient

Variables	n (%)
Sex	
Male	1931 (55)
Female	1581 (45)
Age	
<24	1404 (40)
25–45	1404 (40)
>46	704 (20)
Type of TB	
Sputum positive	1615 (46)
Sputum negative	1369 (39)
EPTB	526 (15)
Treatment out come	
Poor	351 (10)
Complete	3020 (86)
Transfer out	141 (4)
HIV Status	
Positive	58 (2)
Negative	3414 (97)
Unknown	40 (1)
CPT prophylaxis	
Yes	58 (100)
No	0
ART status	
On ART	44 (76)
Pre-ART	14 (24)
Treatment out come with	
ATT+ART	
Poor	13 (29)
Good+complete	31 (71)
Pre-ART	14 (100)

TB: Tuberculosis, EPTB: Extrapulmonary TB, HIV: Human immunodeficiency virus, CPT: Cotrimoxazole preventive therapy, ART: Antiretroviral therapy, ATT: Antituberculosis therapy

Table 2: Demographics factors associated with human immunodeficiency virus coinfection

Predictor variable	Coinfection	
	Yes	No
Sex		
Male	30	1531
Female	28	1931
Age		
<24	12	1404
25–45	36	1404
>46	10	704
Type of TB		
Sputum positive	32	1615
Sputum negative	18	1369
EPTB	8	528
Treatment outcome		
Poor	13	
Complete	31	
Pre-ART	14	

TB: Tuberculosis, EPTB: Extrapulmonary tuberculosis, ART: Antiretroviral therapy

The prognosticators of HIV coinfections are shown in Table 2. Among overall TB cases, 3512 all have been selected for HIV. Percentage of TB and HIV coinfection was 58 (2% coinfection was 3 times greater in 20–40-year age groups and 2 times higher in PTB sputum-positive cases. EPTB cases - 76% took CPT + ART. The treatment success was 86%.

DISCUSSION

With this observation, the incidence rate of TB-HIV coinfection was found as 1.65% and it was lower than the India TB report 2019, which indicates a HIV coinfection rate of 3.4%. In this study, mortality rate was 22% among the cases showing the infection of both TB and HIV. Likewise in another research performed by Kamath *et al*. among the South Indian population, cases with HIV-TB coinfections showed a complete fatality proportion nearly 25% [16]. Considering the prognosticators of mortality, CPT acts in defending aspect from mortality amid persons infected with HIV containing those on ART. In line with this conclusion, reports from South India revealed high risk of mortality amid cases not taking CPT [17].

Preceding reports established positive result of ART on persistence consequences of TB-HIV coinfected persons and maximum danger of death on HIV-positive cases as associated to HIV-negative cases [18]. These documents represented less threat of death between TB-HIV coinfected cases who took ART as associated to those cases that were not on ART [18].

Concerning the relationship among the category of TB and mortality, cases with additional pulmonary TB were found to be 17 times further probable to die than those of cases with pulmonary TB comprising smear positive also negative categories. Researches from Nigeria as well as Cameron together described uppermost risk of death between extrapulmonary TB persons. Extrapulmonary TB remains as determined problem and is related with great mortality proportions, particularly among HIV-suffered persons [19,20].

Numerous researches suggested that CTX protective treatment decreases mortality in HIV-infected cases [21]. An earlier the Treat Asia HIV Observational Database (TAHOD) report revealed highest complete survival advantage from PJP prophylaxis, principally through CTX, in cases with aCD4 count <50 cells/lL [22]. Whereas the present study exhibited better survival in persons using CTX, the result revealed only statistically significant in cases with present CD4 101–200 cells/lL probably because of decrease of the benefit by comprising single cases that had commenced cART in the existing investigation.

CONCLUSION

Therefore, routine HIV examination for entire TB cases would be supported inline with the nationwide procedures. Furthermore, establishment of CPT desires to be scaled up by implementing the country wide as well as worldwide recommendations.

ACKNOWLEDGMENT

Nil.

CONFLICT OF INTEREST

None to declare.

FUNDING SOURCES

Nil.

REFERENCES

1. Do Prado TN, Rajan JV, Miranda AE, Dias ED, Cosme LB, Possuelo LG, *et al*. Clinical and epidemiological characteristics associated with unfavorable tuberculosis treatment outcomes in TB-HIV co-infected patients in Brazil: A hierarchical polytomous analysis. Braz J Infect Dis 2017;21:162-70. doi: 10.1016/j.bjid.2016.11.006, PMID 27936379

2. Tiberi S, Carvalho AC, Sulis G, Vaghela D, Rendon A, Mello FC, *et al*. The cursed duet today: Tuberculosis and HIV-coinfection. Presse Med 2017;46:e23-39. doi: 10.1016/j.lpm.2017.01.017, PMID 28256380
3. World Health Organization. WHO Global Tuberculosis Report 2016. Geneva, Switzerland: World Health Organization; 2016. p. 214.
4. World Health Organization. Global TB Report 2020. Geneva, Switzerland: World Health Organization; 2020.
5. Ansa GA, Sifa JS. Tuberculosis and HIV integration in sub-Saharan Africa. Asian Pac J Trop Dis 2015;5:841-9. doi: 10.1016/S2222-1808(15)60927-6
6. World Health Organization. Ending TB in the South-East Asia Region: Broad Strategic Plan 2016-2020. Geneva, Switzerland: World Health Organization; 2016.
7. World Health Organization. A Situational Analysis of Programmatic Management of TB Preventive Treatment in the WHO South-East Asia Region. Geneva, Switzerland: World Health Organization; 2020.
8. Jaiswal RK, Srivastav S, Mahajan H. Socio demographic profile of TB-HIV co-infected patients in Bundelkhand Region, Uttar-Pradesh. Natl J Med Res 2012;2:149-51.
9. Marfatia YS, Sharma A, Modi M. Overview of HIV/AIDS in India. Indian J Sex Transm Dis AIDS 2007;28:1-5. doi: 10.4103/0253-7184.35702
10. Narain JP, Lo YR. Epidemiology of HIV-TB in Asia. Indian J Med Res 2004;120:277-89. PMID 15520482
11. Londhey VA. HIV and tuberculosis--a "cursed duo" in the HAART era. J Assoc Physicians India 2009;57:681-2. PMID 20329423
12. Tabarsi P, Chitsaz E, Moradi A, Baghaei P, Marjani M, Mansouri D. Treatment outcome and mortality: Their predictors among HIV/TB co-infected patients from Iran. Int J Mycobacteriol 2012;1:82-6. doi: 10.1016/j.ijmyco.2012.05.002, PMID 26787060
13. Smith JP, Gandhi NR, Shah NS, Mlisana K, Moodley P, Johnson BA, *et al*. The impact of concurrent antiretroviral therapy and MDR-TB treatment on adverse events. J Acquir Immune Defic Syndr 2020;83:47-55. doi: 10.1097/QAI.0000000000002190, PMID 31809360
14. Stephens F, Gandhi NR, Brust JC, Mlisana K, Moodley P, Allana S, *et al*. Treatment adherence among persons receiving concurrent multidrug-resistant tuberculosis and HIV treatment in KwaZulu-Natal, South Africa. J Acquir Immune Defic Syndr 2019;82:124-30. doi: 10.1097/QAI.0000000000002120, PMID 31513073
15. Gebremariam G, Asmamaw G, Hussen M, Hailemariam MZ, Asegu D, Astatkie A, *et al*. Impact of HIV status on treatment outcome of tuberculosis patients registered at Arsi Negele health center, Southern Ethiopia: A six year retrospective study. PLoS One 2016;11:e0153239. doi: 10.1371/journal.pone.0153239, PMID 27096159
16. Kamath R, Sharma V, Pattanshetty S, Hegde MB, Chandrasekaran V. HIV-TB coinfection: Clinico-epidemiological determinants at an antiretroviral therapy center in Southern India. Lung India 2013;30:302-6. doi: 10.4103/0970-2113.120605, PMID 24339487
17. Vijay S, Kumar P, Chauhan LS, Rao SV, Vaidyanathan P. Treatment outcome and mortality at one and half year follow-up of HIV infected TB patients under TB control programme in a district of South India. PLoS One 2011;6:e21008. doi: 10.1371/journal.pone.0021008, PMID 21814542
18. Sileshi B, Deyessa N, Girma B, Melese M, Suarez P. Predictors of mortality among TB-HIV Co-infected patients being treated for tuberculosis in Northwest Ethiopia: A retrospective cohort study. BMC Infect Dis 2013;13:297. doi: 10.1186/1471-2334-13-297, PMID 23815342
19. Alobu I, Oshi SN, Oshi DC, Ukwaja KN. Risk factors of treatment default and death among tuberculosis patients in a resource-limited setting. Asian Pac J Trop Med 2014;7:977-84. doi: 10.1016/S1995-7645(14)60172-3, PMID 25479627
20. Velasco M, Castilla V, Sanz J, Gaspar G, Condes E, Barros C, *et al*. Effect of simultaneous use of highly active antiretroviral therapy on survival of HIV patients with tuberculosis. J Acquir Immune Defic Syndr 2009;50:148-52. doi: 10.1097/QAI.0b013e31819367e7, PMID 19131895
21. Cheng W, Wu Y, Wen Y, Ma Y, Zhao D, Dou Z, *et al*. Cotrimoxazole prophylaxis and antiretroviral therapy: An observational cohort study in China. Bull World Health Organ 2015;93:152-60. doi: 10.2471/BLT.14.142745, PMID 25838611
22. Lim PL, Zhou J, Ditangco RA, Law MG, Sirisanthana T, Kumarasamy N, *et al*. Failure to prescribe pneumocystis prophylaxis is associated with increased mortality, even in the cART era: Results from the Treat Asia HIV observational database. J Int AIDS Soc 2012;15:1. doi: 10.1186/1758-2652-15-1, PMID 22281054