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Research Article
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Study of cross-referrals between Integrated Counselling & Testing Centre and RNTCP-Designated Microscopy Centre at a tertiary care hospital in Bengaluru, Karnataka

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Introduction: HIV and TB infections continue to fuel and amplify each other. The present study was designed to assess the socio-demographic profile of the clients visiting ICTC and to assess the pattern of cross referrals between ICTC and RNTCP Designated Microscopy Centre at a private medical college in Bengaluru, Karnataka. **Materials & Methods:** This was a descriptive study comprising of all the clients visiting ICTC and TB Suspects visiting RNTCP DMC during the study period from April to December 2018. Data entry was done in MS excel and analyzed in SPSS software. **Results**: A total of 9405 clients visited ICTC during the study period, 68(0.73%) of them were diagnosed to be HIV positive. HIV Seropositivity was found to be higher among 35-49 yrs age group 28(41.17%), male clients 37(54.41%) and among semiskilled workers 19(27.94%) followed by housewives 18 (26.50%). There were 9 HIV concordant couples. 252(19.06%) of the TB suspects visiting the DMC were TB positive. 8(3.17%) clients had HIV-TB Co-infection. Statistically significant association was observed between HIV status and TB status of the study subjects ($p < 0.05$). **Conclusion:** ICTC is an excellent site for both HIV testing and screening for TB. Similarly, RNTCP DMC is instrumental in TB case finding and also for detecting individuals at high risk for HIV seropositivity. Appropriate cross referral between these two centres plays a pivotal role in reducing the burden of both infections.

Keywords: Cross referrals, Designated Microscopy Centre, HIV, RNTCP, TB

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Introduction

India has the world's highest burden of tuberculosis (TB) and third largest number of people living with HIV in the world; it also ranks third in the world for HIV-associated TB. India's national AIDS control programme (NACP) and the revised national TB control programme (RNTCP), were established in 1992 and 1993, respectively.

Both programmes have been instrumental in impacting the burdens of HIV and TB in India. To address the burden of HIV-associated TB, collaborative TB/HIV activities have been implemented by NACP and RNTCP since 2001[1].

Implementation of TB/HIV collaborative activities in India started in 2001 with six high HIV prevalence states. Early collaborative activities included joint training of TB and HIV programme staff and cross-referral of patients.

The cross-referral included intensified case-finding (ICF) at HIV testing and counselling (HTC) centres and referral to RNTCP Designated Microscopy Centres (DMCs), as well as referral of TB patients at high risk of HIV for HTC [1].

HIV-associated TB is fatal if not treated. Early detection and prompt treatment is critical to minimize mortality. Early detection requires effective implementation of provider-initiated HIV testing and counselling in TB patients and intensified TB case finding among PLHIV.

In India these activities are executed by two separate and strong vertical national programmes: RNTCP and NACP. Close collaboration between the two programmes is necessary to ensure 100% detection and ART for all HIV-positive TB patients [1].

RNTCP is facilitating provision of HIV testing services through TB microscopy centres (DMCs) using existing human resources. These efforts aim to optimize utilization of existing resources and make the interventions sustainable [1].

For more than a decade, medical colleges have been providing diagnostic services (Designated Microscopy Centres), treatment [Directly Observed Treatment (DOT) Centres] referral for treatment, recording and reporting data, carrying out advocacy for Revised National Tuberculosis Control Programme (RNTCP) and conducting operational research relevant to RNTCP [2].

This study was conducted to assess the pattern of cross-referrals between ICTC and DMC in order to find areas for improvement for better case finding and reporting of HIV-TB co-infection which is essential for effective management and better prognosis of these cases.

Objectives

01. To assess the socio-demographic profile of clients visiting the Integrated Counseling and Testing Centre (ICTC) at Raja Rajeswari Medical College and Hospital (RRMCH), Bangalore
02. To assess the pattern of cross-referrals between Integrated Counseling and Testing Centre (ICTC) and Revised National Tuberculosis Control programme (RNTCP) - Designated Microscopy Centre (DMC)

Materials and Methods

Study setting: Integrated Counselling and Testing Centre (ICTC) and RNTCP-Designated Microscopy Centre (DMC) at Raja Rajeswari Medical College and Hospital (RRMCH), Bengaluru

Study design: Descriptive study

Study period: Nine months (April 2018 to December 2018)

Study subjects: All the clients visiting ICTC and all the TB suspects visiting RNTCP-DMC at RRMCH during the study period.

Exclusion criteria: Pregnant women visiting ICTC during the study period.

Method of data collection: The study subjects comprised of all the clients attending the ICTC facility during the study period, either voluntarily or after being referred by various departments and all TB suspects attending the DMC and referred to ICTC during the study period. The records pertaining to the HIV status, socio-demographic variables, relevant information regarding TB suspects and cross-referrals from April 2018 to December 2018 were retrieved and analyzed.

Ethical approval was obtained from Institutional Ethics Committee

Statistical analysis: The data was compiled in Microsoft (MS) Excel worksheet and analyzed using SPSS (Statistical Package for Social Sciences) software version 20.0. The descriptive statistics-Qualitative variables were presented as frequency

And percentages. Quantitative variables were presented as mean and standard deviation (this sentence is to be removed). Chi square test of significance was applied to know the association between variables and p value of less than 0.05 was considered statistically significant.

Results

During the study period of nine months, a total of 9405 clients visited ICTC and underwent HIV counseling and testing. It was observed that majority 3058(32.51%) of the clients were above 50 years of age and majority 4747(50.48%) were female clients as shown in Table 1.

Occupation wise, 2096(44.21%) of female clients were housewives and among males, semiskilled workers constituted the majority 1280 (27.44%) [Table 2].

Of the total 9405 clients visiting ICTC, 68(0.73%) were diagnosed to be HIV positive [Table 3] and among them majority 28(41.17%) belonged to the age group of 35-49 years and HIV seropositivity was observed to be higher 37(54.41%) among males, majority of the HIV sero positives 19(27.94%) were semiskilled workers by occupation, followed by housewives 18 (26.50%) as observed from Table 4.

As far as HIV testing of spouses of seropositive ICTC clients was concerned, there were 14 discordant couples. Among the 9 concordant couples HIV seropositivity was observed to be higher 5 (55.56%) among female spouses of male HIV positive clients as compared to male spouses 4 (44.44%) of female HIV positive clients [Table 5].

Table-1: Socio-Demographic characteristics of clients tested at ICTC (N=9405)

Variable	Number	Percentage
Age(years)		
<14	206	2.21
15-24	1378	14.65
25-34	2159	22.95
35-49	2604	27.68
>50	3058	32.51
Gender		
Male	4658	49.52
Female	4747	50.48
Total	9405	100.00

Table-2: Gender wise distribution of ICTC clients according to their occupation (N=9405)

Occupation	Male	Females	Total
Semi professional	1075(23.05)	955(20.14)	2030(21.60)
Skilled	413(8.86)	15(0.32)	428(4.55)
Semi skilled	1280(27.44)	617(13.01)	1897((20.17)
Unskilled	730(15.65)	272(5.73)	1002(10.65)
Student	390(8.40)	303(6.40)	693(7.37)
Truck driver	117(2.40)	0	117(1.24)
House wife	0	2096(44.21)	2096(22.29)
unemployed	650(14.00)	474(9.99)	1124(11.95)
Others	9((0.20)	9(0.20)	18(0.18)
Total	4664(100.00)	4741(100.00)	9405(100.00)

Table-3: Distribution of ICTC clients according to their HIV status (N=9405)

HIV status	Frequency	Percentage
HIV positive	68	0.73
HIV negative	9337	99.27
Total	9405	100.00

Table-4: Distribution of clients tested at ICTC according to socio-demographic characteristics and HIV status (N=9405)

Variable	HIV Status		Total no. of clients tested at ICTC
	HIV Negative No. (%)	HIV Positive No. (%)	
Age			
<14	206(2.20)	0(0)	206(2.21)
15-24	1373(14.70)	5(7.35)	1378(14.65)
25-34	2143(22.95)	16(23.53)	2159(22.95)
35-49	2576(27.60)	28(41.17)	2604(27.68)
>50	3039(32.55)	19(27.95)	3058(32.51)
Gender			
Male	4621(49.49)	37(54.41)	4658(49.52)
Female	4716(50.51)	31(45.59)	4747(50.48)
Occupation			
Semi professional	2016(21.60)	14(20.60)	2030(21.60)
Skilled	423(4.53)	5(7.35)	428(4.55)
Semi skilled	1878(20.11)	19(27.94)	1897((20.17)
Unskilled	997(10.70)	5(7.35)	1002(10.65)
Student	691(7.40)	2(2.94)	693(7.37)
Truck driver	115(1.23)	2(2.94)	117(1.24)
House wife	2078(22.25)	18(26.50)	2096(22.29)
unemployed	1121(12.00)	3(4.41)	1124(11.95)
Others	18((0.20)	0(0)	18(0.18)
Total	9337(100)	68(100)	9405(100.00)

Table-5: Distribution of spouse of HIV positive clients according to their HIV test result (n=23) (Please note this table had row percentages previously now it is changed to column percentages)

Variable	HIV Status		Total no. of clients tested at ICTC
	HIV Negative No. (%)	HIV Positive No. (%)	
Spouse*			
Male	3(21.43)	4(44.44)	7(30.44)
Female	11(78.57)	5(55.56)	16(69.56)
Total	14(100.00)	9(100.00)	23(100.00)

*Spouse of HIV positive clients

Table-6: Distribution of HIV status among the TB suspects referred from DMC to ICTC (n= 1322)

	HIV positive No. (%)	HIV negative No. (%)	Total No. (%)
TB positive	8(3.17)	244(96.83)	252(100)
TB negative	3(0.28)	1067(99.71)	1070(100)
Total	11(0.83)	1311(99.16)	1322(100.00)

Chi square value: 70.55 df =1 p=0.000031

With regard to the cross referrals from DMC to ICTC, there were a total of 1322 referrals, of which 252 (19.06%) were TB positive. Of these 252 TB positives, 121 were sputum positive for TB, 9 were sputum negative TB and 122 were extra pulmonary TB.

It was observed that among that 252 TB patients referred from DMC to ICTC, 8(3.17%) patients were found to be HIV positive (i.e., HIV–TB co-infection). Among the TB negative suspects referred to ICTC 3(0.28%) were found to be HIV seropositive [Table 6].

This association between HIV status and TB Status was found to be statistically significant (p= 0.000031). Among the 8 patients who were both HIV and TB positive, 7 were sputum positive TB and 1 was extra pulmonary TB.

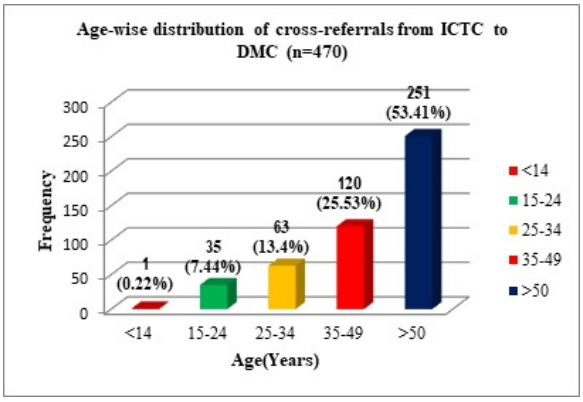

Figure-1: Age-wise distribution of cross-referrals from ICTC to DMC (n=470)

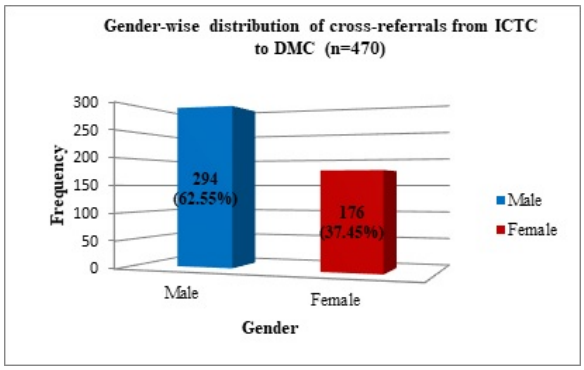

Figure-2: Gender-wise distribution of cross-referrals from ICTC to DMC (n=470)

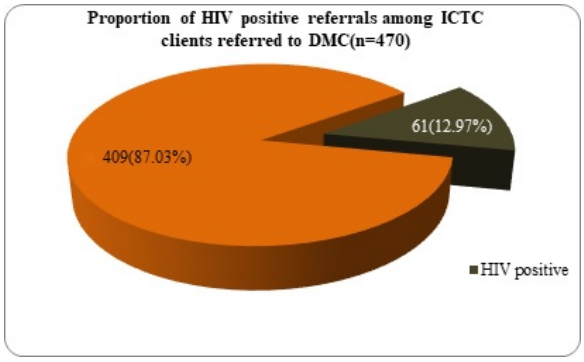

Figure-3: Proportion of HIV positive referrals among ICTC clients referred to DMC (n=470)

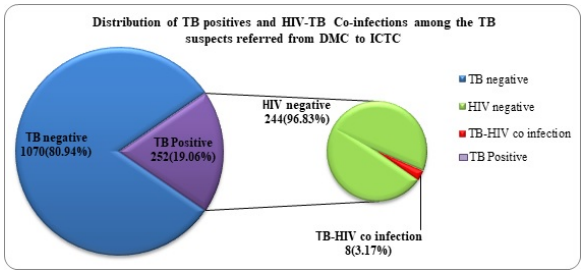

Figure-4: Distribution of TB positives and HIV-TB Co-infections among the TB suspects referred from DMC to ICTC (n=1322)

Among the cross referrals from ICTC to DMC, majority 251 (53.41%) were above 50 years of age [Figure 1] and male clients were 294 (62.55%) [Figure 2]. HIV positive TB suspects constituted 61 (12.97%) [Figure 3].

Figure 4 shows the proportion of TB positives 252 (19.06%) and TB negative 1070 (80.94%) patients among the total TB suspects (1322) visiting the DMC. It also depicts the proportion of HIV negatives 244(96.83%) and HIV positives 8 (3.17%) among the TB positive patients. The figure also reveals that TB-HIV co-infection in this study is 8 (3.17%).

Discussion

The HIV-TB collaborative venture was launched with the primary aim to promote early diagnosis and treatment of HIV in TB patients and of TB in HIV infected individuals. HIV-TB cross-referral and coordination is of utmost importance to improve the outcome and burden of both these infections [3].

An Integrated Counseling and Testing Centre (ICTC) is a place where a person is counseled and tested for HIV either on his own free will or as advised by a medical provider [4].

In our study a total of 9405 clients visited the ICTC during the study period of April 2018 to December 2018, among them majority, 3058(32.51%) of the clients were above 50 years of age this is in contrast to the study by Chauhan N et al [5] where, majority of the study subjects, i.e., 399(79.8%) belonged to age group of 15-49 years. Female clients were 4747(50.48%) whereas in the study by Haider S et al [6], majority was males 79 (68.1%).

Occupation-wise majority 2096(44.21%) of the female clients in our study were housewives and majority 1280 (27.44%) of the male clients were semiskilled workers similar to that of the study by Mishra S et al [7] in which most of the male attendees were semi-skilled(38.61%) workers and most of the females were housewives (72.09%).

The proportion of HIV seropositivity was 68 (0.73%) in our study similar to the study done by Roma C et al [8] where 1.24% of the clients were HIV reactive. However in the study conducted by Mathur A et al [4], 298 (12.35%) were found to be HIV positive.

The HIV seropositivity in our study was observed to be higher than the national values i.e., as per the recently released, India HIV Estimation 2017 report, National adult (15–49 years) HIV prevalence in India is estimated at 0.22% (0.16% – 0.30%) in 2017 [9].

In present study majority 28(41.17%) of the HIV positives belonged to the age group of 35-49 years this is similar to the study by Roma C et al [8] , where maximum sero-reactivity ($p< 0.0001$) was found in 31- 49years age group (42.59%) and HIV positivity was observed to be higher 37(54.41%) among males similar to the study by Chauhan N et al [5] where, out of the 500 sero-positive cases 316 were males (63.20%).

According to occupation majority of the HIV Seropositives, 19(27.94%) were semiskilled workers by occupation, followed by housewives 18 (26.50%) while in the study by Roma C et al [8], maximum seropositivity (32.10%) was found in agricultural workers among the females an alarming number of seropositives (38.57%) were detected in housewives. Housewives maintain the pool of infections [10].

In this study, majority 14 (60.86%) were discordant couples. Among the 9 (39.14%) concordant couples HIV seropositivity was observed to be higher 5 (55.56%) among female spouses of male HIV positive clients as compared to male spouses 4 (44.44%) of female HIV positive clients.

However this difference was not found to be statistically significant ($p=0.47$). This is similar to the findings of the study by Roma C et al [8] where 44.90% were concordant couples and 55.10% were discordant couples.

In the present study, Out of the total 9405 clients tested at ICTC, only 470 (4.99%) TB suspects were referred to DMC similar findings were observed in the study by Ramachandran R et al[11], of the total of 18329 ICTC clients, 1065 (6%, range 5–8%) TB suspects were referred to the DMCs.

The present study shows that there is scope for improvement in identification, referral and documentation of TB suspects visiting the ICTC. Strong emphasis needs to be given to training ICTC counsellors with respect to cross referrals from ICTC to DMC as ICTC initiated TB screening is now being recognized as an important tool in detecting a large burden of TB cases (both among HIV sero-positives and HIV sero-negatives).

ICTC facilities are excellent sites for active TB case finding [3]. Among the cross referrals from ICTC to DMC, HIV Positive TB suspects constituted 61(12.97%).

While Mehra Bet al in their study revealed that of the total of 641 TB suspects and referred to the chest clinic, 264 (41.2%) were HIV sero-positive. In the study by Shrivastava S et al [12], of the 1446 clients counseled at ICTC, 132(9%) clients were HIV-positive TB suspects.

Majority 251 (53.41%) of the cross referrals from ICTC to DMC were above 50 years of age whereas in the study by Shrivastava S et al [12] majority 190(62%) were from 20 to 40 year age group [10].In this study, males were the majority 294 (62.55%) among cross-referrals from ICTC to DMC

Similar finding i.e., majority 175(57%) males was observed in the study by Shrivastava S et al [12].

Tuberculosis clinics have been found to form an important portal of entry for HIV diagnosis and treatment as well as to provide an opportunity for counselling, so that new infections can be prevented in the future [3]. In this study, 100% of the TB suspects visiting the DMC were referred to ICTC for HIV testing.

This was because of the strict implementation of intensified TB-HIV collaborative activities under RNTCP. Of the total 1322 referrals from DMC to ICTC 252 (19.06%) were TB positive. Our study revealed that among the total 252 TB positives 121 clients were sputum positive for TB and 9 were sputum negative TB and 122 were extra pulmonary TB.

Among the 8 (3.17%) clients with HIV-TB co-infection 7 were sputum positive TB and 1 was extra pulmonary TB while in the study by Shrivastava S et al [12]264 confirmed cases of TB were referred to ICTC for their HIV status. There were 33 extra-pulmonary TB (EPTB). HIV-positive sero status was found in 15(56%) sputum positive TB cases, 8(30%) sputum negative TB cases, and 4(15%) of EPTB cases.

The proportion of HIV positivity among TB confirmed cases in our study was 3.14%. Similar finding was observed in the study by Gupta A K et al [13] where total number of TB clients found HIV positive was 446(1.72%). Whereas in the study by Shrivastava S et al[12]and Giri P et al[14]the proportion of TB-HIV co-infection was 10% and 17% respectively.

(Please remove "This study highlights") ICTCs and TB clinics play a significant role of in diagnosing TB or HIV among the patients who have been collaterally referred. It also emphasizes the need for further strengthening the partnership between RNTCP and NACP to extend and expand diagnostic services to both cadres of patients [12].

Although, significant efforts are being made at the national level, it is essential to make efforts at the micro level to achieve system of cross-referrals with sustainable results [15].

Conclusion

The present study highlights the need for intensive training, motivation and supervision of ICTC counselors in order to ensure proper case detection And cross referrals. Regular scheduled interaction, feedback and documentation by the health workers of both ICTC and DMC is imperative for successful implementation TB-HIV collaborative activities.

Authors' contribution

Srividya V. Concept, design, literature search, data collection, finalization of manuscript, Vidusha KSS – Data analysis, interpretation and presentation of data and drafting of manuscript, Shyam A C- Data review, manuscript editing and revising it for intellectual relevance.

Relevance of the study: Against the backdrop of significant public health challenge posed by HIV and TB separately and as co-infection, this study underscores the importance of effective cross-referrals, documentation and feedback between ICTC and RNTCP-DMC for early detection and subsequent care and support of individuals with these infections.

Limitation

Information about cross referrals, data related to the outcome of cross-referrals from ICTC to DMC was found to be inadequate, hence it could not be assessed in this study.

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