Volume : 5 | Issue : 7 | July 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Original Research Paper

"Prevalence of Mdr Tb in Hiv Seropositive and Negative Patients at Ghccd, Visakhapatnam

Medical Science

KEYWORDS :

DR RAGHUMANDA SUNIL KUMAR	MD ASSOCIATE PROFESSOR, DEPT OF PULMONARY MEDICINE, ANDHRA MEDICAL COLLEGE.
DRCHAPPA RAMA NAGA BHUSHANA RAO	MD , DTCD , ASSOCIATE PROFESSOR, DEPT OF PULMONARY MEDICINE, ANDHRA MEDICAL COLLEGE
DR GORANTLA SAMBASIVA RAO	MD, PROFESSOR OF PULMONARY MEDICINE, DEPT OF PULMONARY MEDICINE, ANDHRA MEDICAL COLLEGE
DR KONDA SIREESHA	MD . DEPT OF PULMONARY MEDICINE, ANDHRA MEDICAL COLLEGE

INTRODUCTION

A case of MDR TB was defined as TB patient whose sputum is culture positive for mycobacterium tuberculosis, and is resistant in vitro to INH and rifampicin with or without other anti-tubercular drugs based on DST results from a RNTCP accredited culture and DST laboratory 1.

A new case of TB was defined as patient who has never had treatment for TB or who has taken anti TB drugs for less than 1 month.

Retreatment cases of TB were of 3 types.

a) Patient previously treated for TB, who is started on a retreatment regimen after previous treatment has failed (treatment after failure).

b) a patient previously treated for TB who returns to treatment after previously defaulted more than 2 months (defaulter).

c)a patient who was previously declared cured or treatment completed and is diagnosed with bacteriologically positive (sputum smear or culture) TB (Relapse) 1.

Tuberculosis is one of the most important public health problem worldwide. The emergence of resistance to drugs used to treat TB and particularly MDR TB has become a significant public health problem in number of countries and an obstacle to effective TB control. HIV infection is the most powerful risk factor for progression of TB from infection to disease with 21-34 times more chances to develop the disease as compared to those who are HIV negative 1. Global HIV infection epidemic has increased the burden of TB in many countries. TB is also the leading cause of death in HIV infected persons and may accelerate the course of HIV infection. In addition to increase in TB burden in general HIV infection may also contributing to increase in MDR TB prevalence among patients with TB and has been associated with many MDR TB outbreaks. A better understanding of association between HIV infection and anti TB drug resistance is therefore critical to the future of HIV treatment and control of global TB epidemic 1..

The diagnosis of MDR-TB requires sophisticated laboratories with highly skilled microbiologists. Patients with MDR-TB require a much longer

treatment period, usually 24 months, compared with the 6–8 months required for drug-susceptible TB . Additionally, treatment requires the use of "secondline" drugs, which are more toxic and prohibitively more expensive, with MDR-TB drug costs alone that are, on average, 100- to 300-fold higher than those associated with drug-susceptible TB. Furthermore, patients with MDR-TB have lower cure rates and

higher mortality than do patients with drug-susceptible

TB. In well-performing MDR-TB programs in settings with a low HIV infection prevalence, treatment success is generally 70%–80%; by comparison, treatment success for drug-susceptible TB in well-performing

TB programs can exceed 90% .Many countries have limited capacity to appropriately diagnose and treat MDR-TB.

AIMS&OBJECTIVES

- To study the prevalence of MDR TB in HIV seropositive and seronegative cases and also in new and previously treated cases of pulmonary tuberculosis.

SOURCE OF DATA

- Patients attending Department of government hospital for chest and communicable diseases, Andhra medical college, Visakhapatnam.

STUDY DESIGN

- Prospective observational cross sectional study of new& previously treated pulmonary TB patients from December 2013 to September 2015.

STUDY PERIOD

- From December 2013 to September 2015.

SAMPLE SIZE

- 150 Consecutive cases of patients with symptoms suggestive of pulmonary tuberculosis.

INCLUSION CRITERIA

Patients of more than 18 years of age with symptoms and signs suggestive of pulmonary TB {cough, fever, weight loss, haemoptysis} with/without radiological evidences {exudation, infiltration, cavitation, pleural effusion} are included in the study.

Volume : 5 | Issue : 7 | July 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

EXCLUSION CRITERIA

1. Patients <18 years of age
2. Patients having concurrent psychiatric illness/serious medical illness
3. Pregnant women
4. Extra pulmonary TB cases

Statistical analysis

- For demographic and DST data frequencies and percentages were calculated.
- Difference the groups was analysed by chi-square test.
- P value less than 0.05 is considered statistically significant.

RESULTS AND OBSERVATIONS

This is a prospective observational cross sectional study of patients with symptoms and/signs suggestive of pulmonary tuberculosis, attending 'GOVERNMENT HOSPITAL FOR CHEST AND COMMUNICABLE DISEASES' ,Visakhapatnam.

In the present study 150 cases of PTB suspects are screened for active TB by sputum AFB. Among these 93 cases are sputum positive and 57 cases are sputum negative for AFB. Sputum culture for Mycobacterium tuberculosis was done for these 57 smear negative cases, among these 3 cases showed positive tuberculous growth. So in 96 cases mycobacterium tuberculosis was isolated either by sputum smear/culture. These 96 cases are further investigated by DST testing.

Among the 96 PTB cases 27 cases are newly diagnosed and 69 cases are previously treated PTB. HIV was positive 19 cases and negative in 77 cases. Among the 96 PTB cases MDR TB was isolated in 12 cases. No case of MDR TB was detected in newly diagnosed PTB cases. All 12 cases of MDR TB were from previously treated PTB patients.

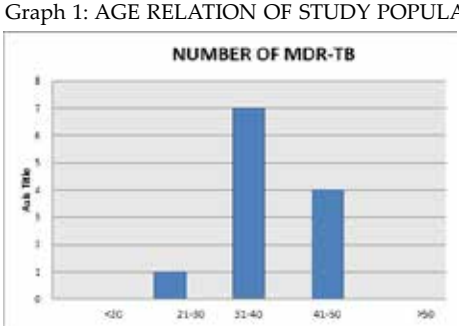
Out of the 12 MDR TB cases 3 cases were in HIV positive patients and 9 cases were in HIV negative patients. These 12 MDR TB isolates are further followed up to 6 months, for 3 and 6 months smear and culture conversion rate.

Table 1: AGE RELATION OF TOTAL STUDY POPULATION

AGE GROUP	NUMBER OF PATIENTS
<20	3 (3.125%)
21-30	18(18.75%)
31-40	32(33.33%)
41-50	18(18.75%)
>50	25(26.041%)
TOTAL	96

Majority of the PTB cases were in 31-40 years of age group, followed by >50 years of age group.31-50 years of age group constituted 50% of cases.

Graph 1: AGE RELATION OF STUDY POPULATION



The mean age of the study population was 40±12.010.

Table 2: SEX WISE DISTRIBUTION OF TOTAL STUDY POPULATION

GENDER	NUMBER
MALES	77(80.208%)
FEMALES	19(19.791%)
TOTAL	96

In the present study males were more common than females and male to female ratio was 4.06:1

Graph 2:SEX DISTRIBUTION OF STUDY POPULATION

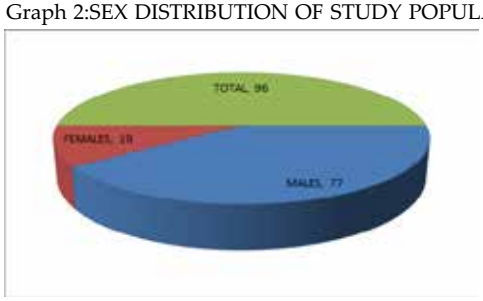
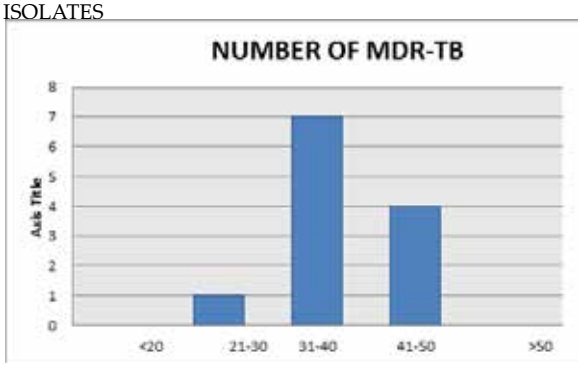


Table3: AGE WISE DISTRIBUTION OF MDR ISOLATES

AGE GROUP	NUMBER OF MDR-TB
<20	0(0%)
21-30	1(8.33%)
31-40	7(58.33%)
41-50	4(33.33%)
>50	0(0%)
TOTAL	12

Majority of MDR TB isolates were in 31-40 years of age group, probably because of more number of PTB cases were in this age group.

GRAPH SHOWING AGE DISTRIBUTION OF MDR TB ISOLATES



Mean age of the MDR TB population was 38.08±7.292
5

Table4: GENDER WISE DISTRIBUTION OF MDR-TB ISOLATES

GENDER	NUMBER
MALES	9(75%)
FEMALES	3(25%)
TOTAL	12

Out of the 12 MDR TB isolates 9(75%) were males and 3(25%) were females.

male to female ratio in MDR TB isolates was 3:1

GRAPH 4 : SEX DISTRIBUTION OF MDR TB ISOLATES

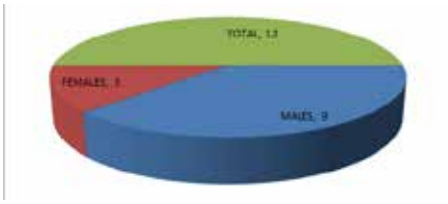


Table5. MDR ISOLATES IN RELATION TO NEW/PREVIOUSLY TREATED CATEGORY

TB CASE	NUMBER	MDR TB ISOLATES
NEW CASES	27(28.2%)	0(0%)
PREVIOUSLY TREATED CASES	69(71.8%)	12(17.39%)
TOTAL	96	12(12.5%)

Out of the 96 PTB cases,27(28.2%) were new cases and 69(71.8%) were previously treated cases. out of the 27 new cases no MDR TB case was isolated. out of the 69 previously treated cases MDR TB was isolated in 12(17.39%) cases.

GRAPH5: MDR ISOLATES IN RELATION TO NEW/PREVIOUSLY TREATED CATEGORY

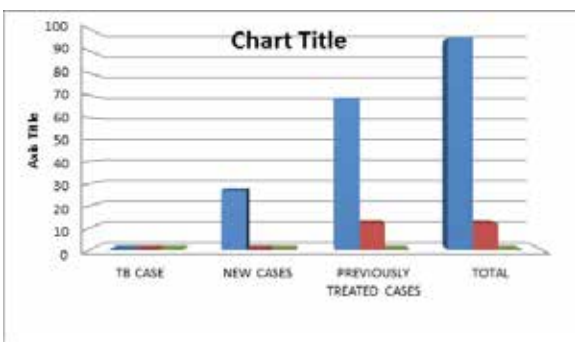


Table6: MDR ISOLATES IN RELATION TO CATEGORY OF PREVIOUSLY TREATED PATIENTS

PREVIOUS TREATMENT CATEGORY	MDR TB ISOLATES
TREATMENT FAILURE	2(16.66%)
RELAPSE	4(33.33%)
DEFAULTER	6(50%)
TOTAL	12

About half (50%) of the MDR TB isolates occurred in defaulters.

Graph6: MDR ISOLATES IN RELATION TO CATEGORY OF PREVIOUSLY TREATED PATIENTS

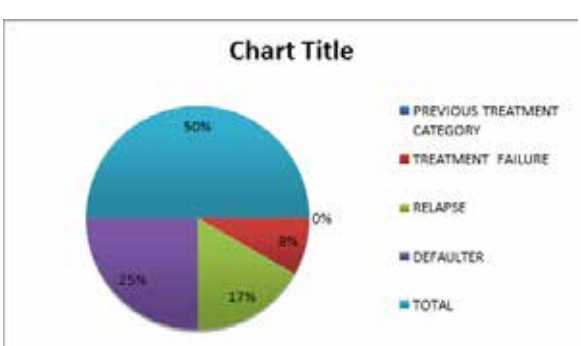


Table7. HIV STATUS IN STUDY POPULATION

HIV	NUMBER
POSITIVE	19(19.79%)
NEGATIVE	77(80.21%)
TOTAL	96

out of the 96 study population 19(19.79%) cases were HIV positive and 77(80.21%) were HIV negative

Prevalence of HIV in the study population was 19.79%.

Graph7: HIV STATUS IN STUDY POPULATION

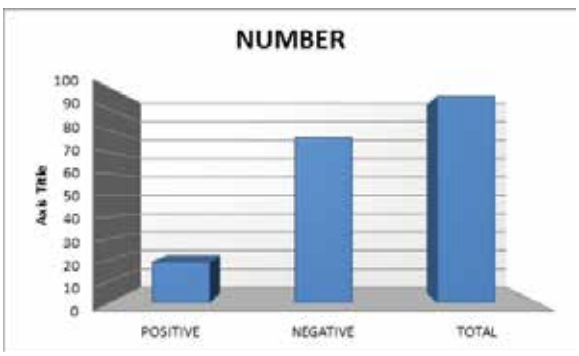


Table8: MDR ISOLATES IN RELATION TO HIV STATUS

HIV	NUMBER	MDR-TB
POSITIVE	19	3(15.78%)
NEGATIVE	77	9(11.68%)
TOTAL	96	12(12.5%)

Out of the 19 HIV positive cases MDR TB was isolated in 3(15.78%) cases. and in 77 HIV negative cases MDR TB was isolated in 9(11.68%) cases.

Graph8: MDR ISOLATES IN RELATION TO HIV STATUS

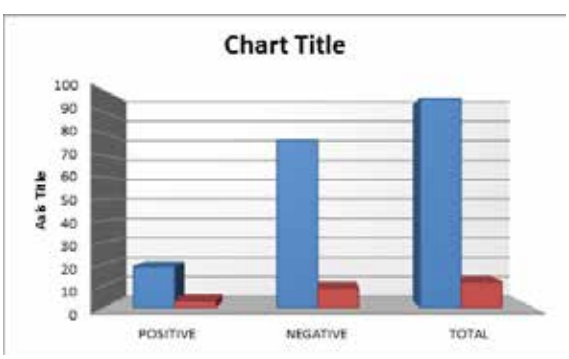


Table9: CD4 COUNT IN HIV POSITVE MDR-TB PATIENTS

CD4 COUNT	NUMBER
<50	0
50-200	2(66.66%)
>200	1(33.33%)
TOTAL	3

out of the 3 MDR TB cases in HIV positive patients,2(66.66%) cases had CD4 count between 50-200 and 1(33.33%) case had CD4 count >200.

Volume : 5 | Issue : 7 | July 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Graph9: CD4 COUNT IN HIV POSITVE MDR-TB PATIENTS

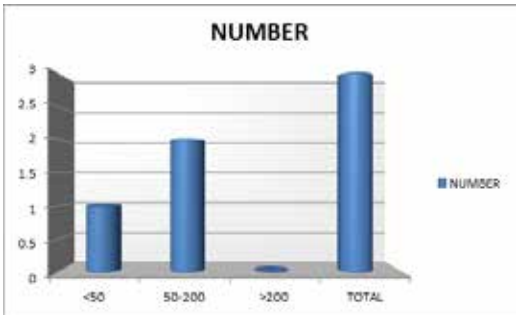


Table10: FOLLOW UP SPUTUM MICROSCOPY IN HIV/ MDR-TB AT THE END OF 3 MONTHS

SPUTUM MICROSCOPY	NUMBER
POSITIVE	0(0%)
NEGATIVE	2(100%)
NOT AVAIABLE DUE TO PATIENT DEATH	1

Out of the 3 MDR TB in HIV positive patients 1 case died before 3 months, and sputum microscopy was negative for the remaining 2 (66.66%) cases at the end of 3 months.

Graph10: FOLLOW UP SPUTUM MICROSCOPY IN HIV MDR TB AT THE END OF 3 MONTHS

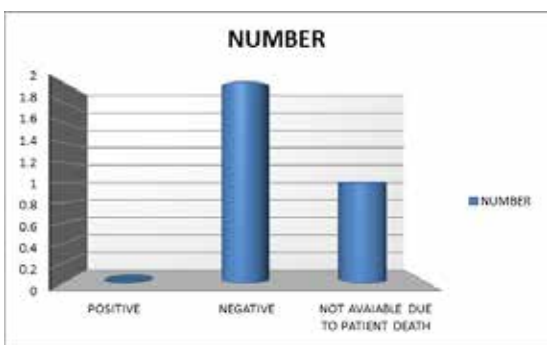


Table11: FOLLOW UP SPUTUM CULTURE IN HIV/MDR-TB AT THE END OF 3 MONTHS

CULTURE REPORT	NUMBER
POSITIVE	0(0%)
NEGATIVE	2(100%)
NOT AVAILABLE DUE TO PATIENT DEATH	1

Out of the 3 MDR TB cases in HIV positive patients 1 case died before 3 months and for the remaining 2 (66.66%) cases sputum culture was negative by the end of the 3 months.

GRAPH11: FOLLOW UP SPUTUM CULTURE IN HIV/ MDR-TB AT THE END OF 3 MONTHS



Table12: FOLLOW UP SPUTUM MICROSCOPY IN HIV/ MDR-TB AT THE END OF 6 MONTHS

SPUTUM MICROSCOPY	NUMBER
POSITIVE	1(50%)
NEGATIVE	1(50%)
NOT AVAILABLE DUE TO DEATH OF THE PATIENT	1

Out of the remaining 2 cases in HIV positive patients sputum microscopy became positive in 1(50%) case, and for 1 case sputum microscopy was continued to be negative by the end of 6 months.

Graph12: FOLLOW UP SPUTUM MICROSCOPY IN HIV/ MDR-TB AT THE END OF 6 MONTHS



Table13: FOLLOW UP SPUTUM CULTURE IN HIV/MDR-TB AT THE END OF 6 MONTHS

CULTURE REPORT	NUMBER
POSITIVE	1(50%)
NEGATIVE	1(50%)
NOT AVAILABLE DUE TO DEATH OF THE PATIENT	1

Out of the remaining 2 cases in HIV positive MDR TB patients culture was positive in 1(50%) case and negative in 1(50%) case by the end of 6 months

GRAPH13: 6 MONTHS FOLLOW UP CULTURE IN HIV/ MDR-TB

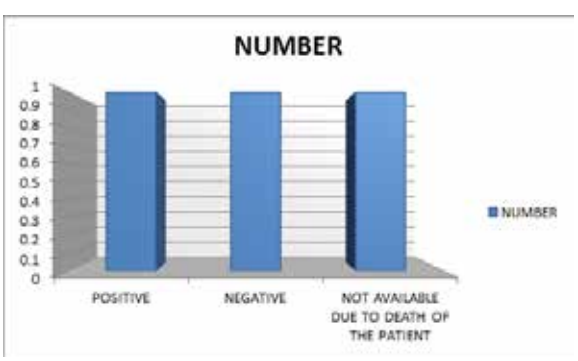


Table14: FOLLOW UP SPUTUM MICROSCOPY IN NON HIV/MDR-TB AT THE END OF 3 MONTHS

SPUTUM MICROSCOPY	NUMBER
POSITIVE	2(25%)
NEGATIVE	6(75%)
LOST FOR FOLLOW UP	1

Out of the 9 MDR TB cases in HIV negative patients, 1 case was lost for follow up, and out of remaining 8cases sputum microscopy was positive for 2(25%) cases and negative for 6(75%) cases.

Graph14: FOLLOW UP SPUTUM MICROSCOPY IN NON HIV/MDR-TB AT THE END OF 3 MONTHS

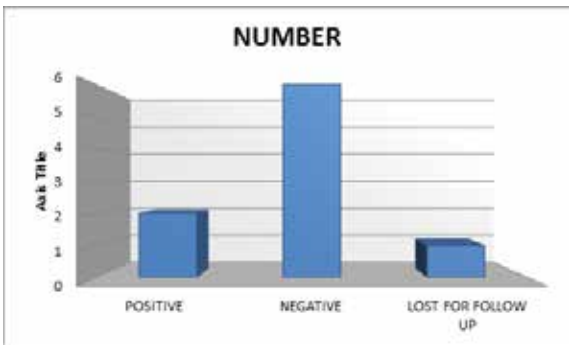


Table15. FOLLOW UP SPUTUM CULTURE IN NON HIV/ MDR-TB AT THE END OF 3 MONTHS

SPUTUM CULTURE	NUMBER
POSITIVE	1(12.5%)
NEGATIVE	7(88.5%)
LOST FOR FOLLOW UP	1

Out of the 9 MDR TB cases in HIV negative patients,1(12.5%) case remained smear positive ,7(88.5%) cases were smear negative by the end of 3 months and 1 case lost for follow up.

Graph 15: FOLLOW UP SPUTUM CULTURE IN NON HIV MDR TB AT THE END OF 3 MONTHS

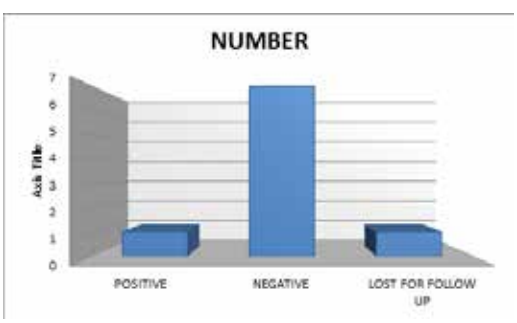


Table16. FOLLOW UP SPUTUM MICROSCOPY IN NON HIV/MDR-TB AT THE END OF 6 MONTHS

SPUTUM CULTURE	NUMBER
POSITIVE	0(0%)
NEGATIVE	8(100%)
LOST FOR FOLLOW UP	1

after 1 case was lost for follow up, in remaining 8 cases smear became negative by 6 months .So by 6 months no case was smear positive in non HIV MDR TB.

GRAPH16: FOLLOW UP SPUTUM MICROSCOPY IN NON HIV MDR TB AT THE END OF 6 MONTHS

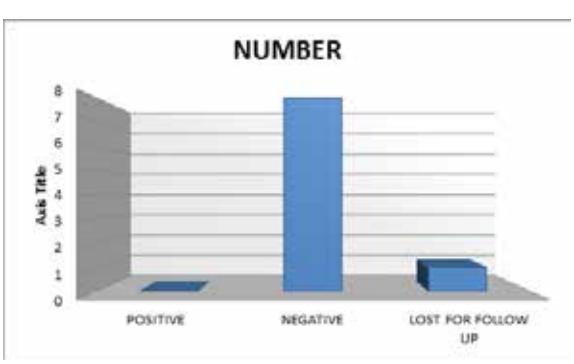
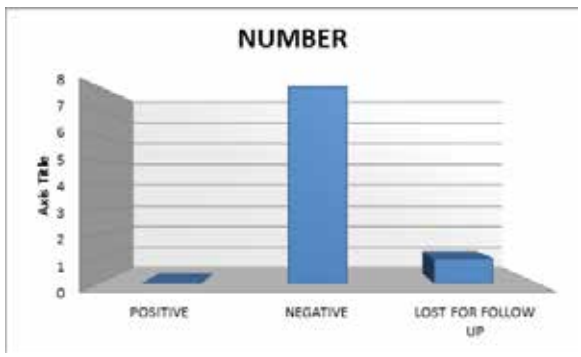


Table17. FOLLOW UP SPUTUM CULTURE IN NON HIV/ MDR-TB AT THE END OF 6 MONTHS

CULTURE REPORT	NUMBER
POSITIVE	0(0%)
NEGATIVE	8(100%)
LOST FOR FOLLOW UP	1

Out of the 9 MDR TB cases in HIV negative patients 1 case was lost for follow up, and in remaining 8 cases culture became negative by 6 months .so by the end of 6 months no case was culture positive in non HIV MDR TB.

Graph17: FOLLOW UP SPUTUM CULTURE IN NON HIV MDR TB AT THE END OF 6 MONTHS



DISCUSSION

Emergence and spread of drug resistant Mycobacterium Tuberculosis is a serious threat to tuberculosis control programme because patients with drug-resistant bacilli respond less readily to therapy than those with sensitive bacilli, resulting in preferential spread of the drug resistant bacilli in the community.

while the treatment of drug-susceptible tuberculosis (TB) has excellent clinical outcomes even in the setting of human immunodeficiency virus (HIV) infection, the treatment of multidrug-resistant TB (MDR-TB), defined as resistance to at least isoniazid (INH) and rifampicin (RMP), results in longer time to culture conversion, less frequent cure rates, higher mortality, and more frequent toxicities compared with conventional treatment for drug-susceptible TB 17. Moreover, treatment outcomes in MDR-TB are further compromised by co-infection with HIV. In the era before highly active antiretroviral therapy (HAART), HIV-infected patients with MDR-TB had significantly poorer treatment responses and higher mortality compared to non-HIV-infected MDR-TB patients. Sputum culture conversion is an accepted surrogate endpoint in MDR-TB treatment. On an individual level, the treatment for both DR TB (particularly MDRTB) and HIV is prolonged, expensive, and complicated compared with the treatment for susceptible TB and HIV co-infection. The complexities of treatment increase the risk of patient harm (including the risk of treatment failure) to the patient through drug interactions, drug intolerance, and non-compliance. In addition, treatment outcomes appear to be poorer for HIV-infected patients who also have DR TB. Mortality rates in MDRTB and HIV co-infected people are higher than for HIV-infected patients with drug susceptible TB.

SUMMARY

In this study "Prevalence of MDR TB in HIV seropositive and HIV seronegative patients", 150 PTB suspects were screened. Out of which 96 PTB cases were detected. Males were more common than females and most of them were in the 31-40 years of age group, followed by >50 years of age group.

Volume : 5 | Issue : 7 | July 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Among the 96 PTB cases 12 cases were MDR TB. In the MDR TB population also males were more common than females and majority were in 31-40 years of age group probably because of more number of PTB cases were in this age group.

In this study Prevalence of MDR TB in the total study population was 12.5%.

In this study prevalence of MDR TB among newly diagnosed TB patients was 0%.

In this study prevalence of MDR TB among previously treated TB patients was 17.39%.

In previously treated TB patients half of the MDR TB isolates occurred in defaulters.

Prevalence of HIV positive status in the TB isolates was 19.79%.

Prevalence of MDR TB in HIV seropositive patients was 15.78%.

Prevalence of MDR TB in HIV seronegative patients was 11.68%.

Among the HIV seropositive MDR TB patients most of them (66.66%) had CD4 count between 50-200 at the time of MDR TB diagnosis.

Mortality rate in HIV positive MDR TB patients observed was 33.33% at the end of 6 months follow up.

No case mortality was detected in HIV negative MDR TB patients at the end of 6 months follow up.

No significant difference was observed in the smear and culture negativity at the end of 3months, smear and culture conversion rates at the end of 6 months in follow up of MDR TB patients between HIV seropositive and seronegative group.

Based on Pearson chi square test statistically no significant difference was observed in the prevalence of MDR TB between HIV seropositive and HIV seronegative patients (p value 0.628)

CONCLUSION

In conclusion, no significant difference was seen in anti-tuberculosis drug resistance in HIV seropositive and seronegative tuberculosis patients. In view of the conflicting results from other studies and high prevalence of HIV-TB in our country, we feel that monitoring of anti-tuberculosis drug resistance pattern in TB patients in general and HIV seropositive tuberculosis patients in particular, would provide important data, which may be crucial for the National Tuberculosis Control Programme.

The present study emphasizes the need for strengthening laboratory diagnosis of MDR-TB and XDR-TB, infection control methods to avoid transmission to health care workers and in community. Research to be promoted for development of new diagnostic methods, drugs and vaccines for early detection and management of MDR-TB.

Overall, these findings emphasize the importance of continuing the systematic surveillance of M. tuberculosis isolates to monitor the trends of drug resistance in different patient categories as well as its association with HIV across the country to timely modify and strengthen the national programs in order to prevent the emergence of MDR-TB strains and avert the threat of XDR-TB.

REFERENCES

1. C.N.Deivanayagam et al,prevalence of acquired MDR TB and HIV coinfection, The indian J chest allied sci 2002,44:237-242.
2. Walls, Genevieve, et al. "Drug-resistant tuberculosis in HIV-infected patients in a national referral hospital, Phnom Penh, Cambodia." Global health action 8 (2015)
3. Sethi S, Mewara A, Dhatwalia SK, Singh H, Yadav R et al. (2013) Prevalence of multidrug resistance in Mycobacterium tuberculosis isolates from HIV seropositive and seronegative patients with pulmonary tuberculosis in north India. BMC Infect Dis 13: 137. doi:10.1186/1471-2334-13-137.
4. wells et al.,HIV Infection and Multidrug-Resistant Tuberculosis—The Perfect StormJ Infect Dis. (2007) 196 (Supplement 1): S86-S107 doi:10.1086/518665.
5. Otu A, Umoh V, Habib A, Ameh S, Lawson L, et al. (2013) Drug Resistance among Pulmonary Tuberculosis Patients in Calabar, Nigeria. Pulm Med 2013: 235190..
6. Campose PE ,Suarez PG,Sanchez J, et al. multidrug resistant mycobacterium tuberculosis in HIV infected persons ,Peru. Emerg Infect Dis 2003;9:1571-8
7. Magee MJ, Blumber g HM, Broz D, Furner SE, Samson L, Singh S, Hershow RC et al, 2012. Prevalence of drug resistant tuberculosis among patients at high risk for HIV attending out patient clinics in Delhi, India. South East Asian Journal of Tropical Medicine and Public Health; 43 (2): pp. 354-363
8. Oluwaseun E, Akinniyi P, Afolabi O (2013) Primary multi-drug resistant tuberculosis among HIV seropositive and seronegative patients in Abeokuta, South western Nigeria. American Journal of Research Communication 2013 ISSN: 2325-4076
9. Catherina H, Cobelens F, Kalisvaart N, van der Have JJ, van Gerven PJHJ, van Soolingen D. Tuberculosis drug resistance and HIV infection, the Netherlands. Emerg Infect Dis 2007; 13:776–778
10. Suchindran S, Brouwer ES, Van Rie A. Is HIV infection a risk factor for multi-drug resistant tuberculosis? A systematic review. PLoS ONE 2009;4:e5561.
11. Sanchez-Padilla E, Dlamini T, Ascorra A, Rüsch-Gerdes S, Tefera ZD, et al. (2012) High prevalence of multidrug-resistant tuberculosis, Swaziland, 2009-2010. Emerg Infect Dis 18: 29-37.