Original Research Paper

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DETERMINATION OF HIV STATUS IN TRUENAT POSITIVE TUBERCULOSIS PATIENTS- AN OBSERVATIONAL STUDY.

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ABSTRACT **Background:** Tuberculosis (TB) is a communicable disease which is a leading cause of death worldwide. India has a high tuberculosis (TB) burden. Tuberculosis (TB) and HIV co-infections have a global prevalence with devastating morbidity and massive mortality, a significant percentage of TB cases are Human immunodeficiency virus (HIV) positive also. As the HIV epidemic is fuelling the global TB epidemic, the prevalence of the virus in TB patients is a sensitive indicator of the spread of HIV into the general population in many regions. **Aim & Objectives:** The aim of this study was to determine the prevalence of HIV-infection among Tuberculosis positive patients. **Materials And Methods:** This is an Observational study, conducted in Secondary care hospital in TB centre. This Study was conducted on positive TB cases from (January 1st 2023 to March 31st 2024). TB cases were defined as cases with positive Mycobacterium tuberculosis (MTB) by Ziehl neelsen method, Truenat or by radiological and clinical findings. TB cases were screened using a HIV Tridot spot test, followed by confirmatory diagnostic technique for detecting both (HIV 1& 2 Ag). **Results:** A total of 314 participants were diagnosed with TB. Those cases were tested for HIV coinfection. Out of which 102 (32.4%) were Sero-positive for HIV testing which is suggestive of co-infection with TB. Among 102 cases,Rifampacin resistance was 3.8% and 56.8% were Males and 43.1% were Females. Out of 102 cases, 50% belongs to stage 1, 44.1% to stage 2, 5.8% belongs to stage 3 of HIV depending on CD4 levels according to CDC guidelines. **Conclusion:** In this study the prevalence of TB-HIV co-infection was high (32.4%). The risk of TB/HIV occurrence was found to be high among patients. Furthermore, since clinical variables were associated with TB/HIV co-infection, health professionals should care for patients who are in WHO clinical stage III HIV, and patient who had lower CD4 counts. So, all TB patients should be assessed for HIV risk factors and further counselled for HIV testing. Conversely, all HIV-positive cases should be screened for TB.

KEYWORDS : HIV, TB, CD4 count, Truenat

INTRODUCTION

- Tuberculosis (TB) is an infectious and communicable bacterial disease caused by Mycobacterium tuberculosis.
- It is transmitted from one person to other via droplets from the throat and lungs of people with the active respiratory disease.
- Tuberculosis (TB) is a major cause of of mortality and morbidity and one of the leading causes of death worldwide.
- According to 2010 World Health Organization (WHO) global TB report, the annual incidence of TB was 9.4 million cases, of which 2 million cases were from India,
- 21.4 Lakh TB cases notified in 2021, **18% higher** than 2020 ,with two deaths occurring every three minutes.
- **Infection with both HIV and TB is called HIV-TB coinfection**
- Tuberculosis (TB) and HIV co-infections have a global prevalence with devastating morbidity and massive mortality, a significant percentage of TB cases are Human immunodeficiency virus (HIV) positive also.
- As the HIV epidemic is fuelling the global TB epidemic, the prevalence of the virus in TB patients is a sensitive indicator of the spread of HIV into the general population in many regions.

MATERIALS AND METHODS

Study Design:

- **Type of study:** Observational study
- **Study group and sample size:** 200 TRUENAT Confirmed positive TB Patients.
- **Place of study**: Department of Microbiology, Tenali District hospital,Tenali,Guntur District
- **Study period:** January 2023 to March 2024 (15months)
- This is an Observational study, conducted in Secondary care hospital (District hospital Tenali)around Guntur.
- TB cases were defined as cases with positive Mycobacterium tuberculosis (MTB) by Ziehl-Neelsen stain, Truenat or by radiological and clinical findings.
- All tuberculosis patients who gave consent for HIV testing (after pre-test counselling) including in-patient and out-patient wards of the Department of Medicine were participated in the study.

Study Procedure:

- Collection of specimens from a presumptive TB/known TB Patient
- Liquefaction and lysis of specimen using the Trueprep AUTO MTB sample pre-treatment pack
- Extraction and purification of DNA using Trueprep AUTO v2 Universal Cartridge-based sample prep kit and Trueprep AUTO v2 Universal Cartridge-based sample prep device
- Amplification of extracted DNA by the Truelab Real-time micro-PCR analyzer using freeze dry PCR reagent in microtubes on a Truenat MTB chip (35 minutes)
- DNA from positive test results is tested using Truenat MTB RIF Dx chip as a reflex test
- The positive TB cases were tested for HIV using three tests for confirmation as per NACO guidelines.
- As in first test COMBAIDS Immunodot Immunochromatography test kit is used to interpret the result as REACTIVE or NON REACTIVE.
- When test is reactive, HIV test kit 2 is used which detects antibodies to HIV 1/2.
- The test is proceeded and confirmed by using HIV 1/2 IMMUNOCONCENTRATION test kit. It detects HIV antibodies based on immunoconcentration assay .

Interpretation:

If in first test it is reactive ,only then it is proceed with second and third test ,where if either of them shows negative ,the sample is again repeat for testing after 3 months and the result is given as INDETERMINATE.

RESULTS:

- A total of 314 participants were diagnosed with TB.

- Out of which 10 cases reported rifampicin resistance in TB patients (3.18%),5 cases were resistance in TB-HIV infection patients(4.9%).
- Those cases were tested for HIV coinfection. Out of which 102 (32.4%) were Sero-positive for HIV testing which is suggestive of co-infection with TB.
- Among 102 cases, 56.8% were Males and 43.1% were Females
- Out of 102 cases, 50% belongs to stage 1, 44.1% to stage 2, 5.8% belongs to stage 3 of HIV depending on CD4 levels according to CDC guidelines. In this study HIV-TB Coinfection is more prevalent among age group between 31-40 years with (33.3%).
- Least is seen in the age group between 1-15 years with (2.9%).

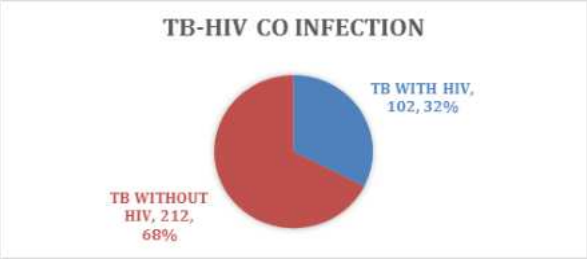

Figure 1: TB HIV Coinfection

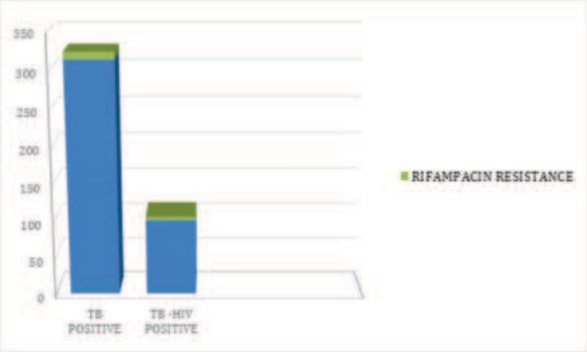

Figure 2: Rifampacin Resistance Among TB Positive And TB-HIV Positive Patients

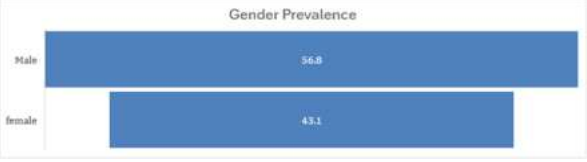

Figure 3: Gender Prevalence among TB-HIV co-infection

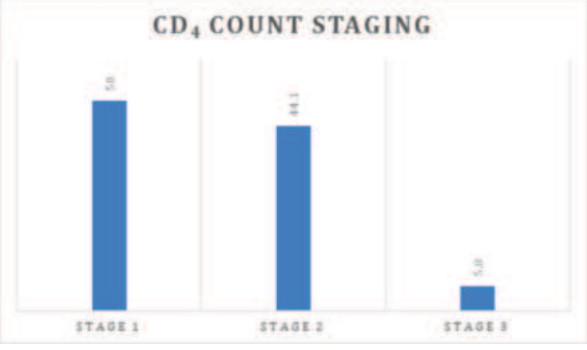

Figure 4: CD_4 Count Staging

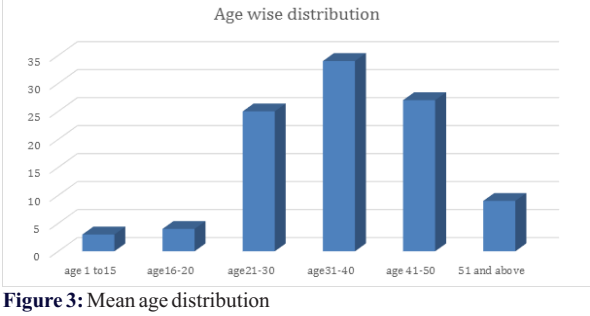

Figure 3: Mean age distribution

DISCUSSION:

Prevalence Rate

Author	Prevalence	Year	Place Of Study
G. Pennap	41.2	2010	AFRICA
V. C. Soyam	2.4	2015	DELHI
Magna Manjareeka	12.3	2013	EASTERN INDIA
Mohalleb A Alrayah	7.3	2019	SUDAN
G.E Sume	51.6	2008	africa
PRESENT Study	32.4	2024	Andhra Pradesh ,India

Gender Wise

Author	Year	Place Of Study	Prevalence More In Male Or Female
Mohalleb A Alrayah	2019	SUDAN	MALE >FEMALE
N.Adhikari	2019	nepal	MALE >FEMALE
Abia Ali Channa	2016	Pakistan karachi	MALE >FEMALE
G.E Sume	2008	AFRICA	FEMALE >MALE
PRESENT Study	2024	GUNTUR	MALE >FEMALE

Age Wise

Author	Year	Place	Highest Prevalent Age Group
N.Adhikari	2019	nepal	30 YEARS
Abia Ali Channa	2016	Pakistan karachi	19-40 YEARS
G.E Sume	2008	AFRICA	25-44 YEARS
S.K SAH	2015	NEPAL	35-39 YEARS
PRESENT Study	2024	GUNTUR	31-40 YEARS

CONCLUSION:

1. In this study the prevalence of TB/HIV co-infection was (32.4%) which is high with male preponderance and seen more prevalent among the age groups of 31-40 years.
2. Since clinical variables were associated with TB/HIV co-infection health professionals should care for patients who are in WHO clinical stage III HIV, and patient who had lower CD4 counts.
3. So, all TB patients should be assessed for HIV risk factors and further counselled for HIV testing.
4. Conversely, all HIV-positive cases should be screened for TB and therefore deaths can be prevented.
5. With proper care like screening, treatment and followup , TB can be prevented and cured .

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