

Prevalence of Primary Drug Resistance in Tuberculosis

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Summary

The prevalence of primary Antitubercular drug resistance was found to be quite high in Meerut. The resistance to individual drugs was Pyrazinamide 20% , Inh 15.6%, Rifampicin 18.5%, Streptomycin 10%, Ehtambutol 0% . MDR was found to be 18.5% which is much higher than reported earlier.

Introduction

Tuberculosis happens to be one of the most common infectious diseases. India accounts for one third of global burden. Each year 18 lac new cases of tuberculosis occur in the country accounting for nearly 1000 deaths every day. It is a totally treatable disease if correct combination of drugs are given. Development of resistance is an important obstacle in its control. That is why it is important to know the sensitivity of bacteria in vitro in different areas nowadays. This study was undertaken to know the current sensitivity pattern of mycobacterium tuberculosis in and around Meerut & Modinagar U.P. (60 km from Delhi)

Objective : to find out the prevalence of drug resistance to primary line of drugs in treatment naïve sputum positive pulmonary tuberculosis patient in and around Meerut & Modinagar.

Material & methods : the patients presenting with pulmonary tuberculosis who had no past h/o anti tuberculous treatment were included in the study. Three sputum samples were sent for staining for a f b and one sputum was sent for bactec 960 culture for mycobacterium in a reputed pathological lab. All positive cultures for mycobacterium tuberculosis were subsequently analysed by the same lab for sensitivity to 5 primary line of anti tuberculosis drugs ie rifampicin, ethambutol, pyrazinamide, isoniazid and streptomycin by bactec 460 radiometric system.

Findings

120 consecutive treatment naïve patients were enrolled in the study from august 2006 to june 2008. There were 67 males and 53 females in the age group of 10 years to 70 years. Their sputum was sent for afb staining and bactec c&s. --- had at least one of the sputum + ive on staining. 80 cultures were found + ive 2 of which were contaminated. 40 samples did not grow bacteria. 2 of (78) these grew afb other than tuberculosis and thus excluded from the study. Of the remaining 76 samples, sensitivity reports of 6 were not available thus detailed c&s reports of 70 cultures specimens was available for analysis for sensitivity to all 5 primary drugs. 22 of 70 were found sensitive to all drugs tested. 48 were resistance to one or more drugs. 26 of these strains were resistance to one drug. In order of drugs showing maximum resistance were pyrazinamide > inh > rifampicin > streptomycin. No resistance was reported to ethambutol. While 13 (out of 70) were resistant to inh and rifampicin ie mdr tuberculosis. Thus in the current study prevalence of mdr tb in treatment naïve patients was found to be 18.5%. 10 isolates out of 70 were resistant to 3 drugs.

Discussion

The present study clearly indicate high resistance in treatment naïve pulmonary tuberculosis patients presenting to private practitioners in Meerut & IDST Modinagar U.P. MDR tuberculosis was found in 18.5% patients. (mdr has been defined as resistance to at least two most potent antituberculosis drugs rifampicin and isoniazid) this is much higher than reported in past studies in India (1 5%) even though the numbers of isolates tested is small, such high resistance should ring alarm bells in

mind of practitioners and policy makers alike. The population tested was a true representative of what a private practitioner is likely to encounter. Resistance to pyrazinamide was highest (20%). This finding is in contrast to previous studies which reported small or no resistance to this drug. The resistance to Inh was 15.6% equal to what was observed in other studies in India (2.9 to 32.8%). No resistance was reported to ethambutol. It matches low resistance to this drug found in other studies also in India and abroad (0.6% - 24.0%)

More studies are required to confirm the finding of this study. If this is the current resistance trend, newer practice guidelines need to be devised to counteract this high level of primary resistance.

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References

1. Gangadharan P.R.J: Drug resistance in mycobacteria, Boca Raton Florida, CRC Press Inc. 1984.
2. Telenti A., Imboden P., Marchesi F., Lowrie d., Colis, Colston M.J., Matterl, Shopfer K., Bodner T., Detection of R-resistant mutations in mycobacterium tuberculosis Lancet, March 1993, Vol341;647-650.
3. Canetti G., Froman S., Grosset J., Haudroy P., Langerova M., Mahler H.T., Meissner G., Mitchison D.A., Sula L: Mycobacterial laboratory methods for testing drug sensitivity and resistance. Bull, WHO, 1963; 29:565-578.
4. Collins T., Levett P.N: Radiometric studies on the use of selective inhibitors in the identification of Mycobacterium species. J. Med . Microbiology, 1989, 30/3 :pp.175-181.
5. Gupta A., Sharma S.K., Panda J.N.: Diagnostic methods for tuberculosis Ind. Jour. Chest Dis. And Allied Sc., 1993, 35/2: pp63-84.
6. Kim S.J., Hong Y.P.: Drug Resistance in Korea . Tub. and Lung Dis., 1992, 73: pp219-224.
7. Iseman M.D.: Treatment of drug resistant tuberculosis. NEJM. 1993, Vol. 329: No. 11, pp 784-790.
8. Raj B., Gupta K.B., Yadav R.: changing pattern of acquired drug resistance in patients of pulmonary tuberculosis. Lung India 1993, XI: No. 3, 83-85.
9. Overview of drug resistant TB in India by N. Paramasivan Indian Journal of tuberculosis, 1998, 45-73.
10. WHO/IUARD Global Project on Anti tuberculosis Drug resistance surveillance Report No. 3 WHO/CDS/TB/2004.
11. Drug resistance in tuberculosis in India /C.N. Paramasivan and P. Venkataraman Indian J of Medical Research 120 oct 2004 pp 377-386.
12. Mazouni L, Zidouni N, Boulahbal F, Chault P. Treatment failure and relapse cases of pulmonary tuberculosis within a national programme based on short course chemotherapy. Preliminary report. Tuberculosis Surveillance Reserch Unit of the International Union Against Tuberculosis and Lung Disease, Progress Report 1992, Vol 2: 36-42.
13. World Health Organisation. Anti-tuberculosis drug resistance in the world : Report No. 2 WHO/CDS/2000:278.
14. ICMR. Prevalence of drug resistance in patients with pulmonary tuberculosis presenting for the first time with symptoms at chest clinics in India Part I . Findings in urban clinics among patients giving no history of previous chemotherapy. Ind J Med Res 1968; 56: 1617-30.
15. ICMR Prevalence of drug resistance in patients with pulmonary tuberculosis presenting for the first time with symptoms at chest clinics in India Part II. Findings in urban clinics among all patients with or without history of previous chemotherapy Ind J Med Res 1969; 57: 823-35.
16. Krishnaswamy KV, Rahim MA Primary drug resistance in pulmonary tuberculosis. Indian J chest Dis 1976; 28: 233-7.
17. Trivedi SS and Desai SC , Primary anti tuberculosis drug resistance and acquired rifampin resistance in Gujrat , India . tubercle 1988; 69: 37-42.
18. Chandrasekaran S , Jagota P, Chaudhuri K . Initial drug resistance to antituberculosis drugs in urban and rural district tuberculosis program . Ind J Tub 1992; 39: 171-175.
19. Jain NK, Chopra KK, Prasad G. Initial and acquired Isoniazid and Rifampicin resistance to M. Tuberculosis and its implications for treatment . Ind J Tub 1992; 39: 121-4.
20. Jena J Panda BN, Nema SK, Ohri VC, Pahwa RS, Drug resistance pattern of M. tuberculosis in a chest diseases hospital of armed forces. Lung India 1995; 13: 56-9.
21. Vasantakumari R, Jagannath K Multidrug resistant tuberculosis A Tamil Nadu study . Lung India 1997: XV, 178-80.
22. Dhindra VK, Rajpal S, Bhalla P, Yadav A, Jain SK, Hanif M, Prevalence of initial drug resistance of M. tuberculosis in new sputum positive RNTCP patients J. Commu Dis 2003; 35 (2) : 82-89.