PRIMARY DRUG RESISTANCE OF MYCOBACTERIUM TUBERCULOSIS TO ANTITUBERCULOSIS DRUGS

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Abstract

Thirty two positive sputa from 104 untreated cases of pulmonary tuberculosis, were tested for sensitivities against antituberculosis drugs. Twenty four were positive on direct smear as well as culture while 8 were only culture positive. Nine (28%) were resistant to Isoniazid, 3 (9.4%) to Streptomycin and 2 (6.3%) were resistant to both the drugs. All the 32 were sensitive to Rifampicin and Ethambutol(JPMA 38: 73 , 1988).

INTRODUCTION

Tuberculosis is a major health problem of developing countries includbg Pakistan. Considerable advancement has been achieved in the management of the disease with the introduction of new more potent and less toxic drugs, but the problem of drug resistance has also increased. In the economically advanced countries primary drug resistance has been reported in 3-5% of cases[1]. From Hong Kong, a prevalence rate of 15% of primary thug resistance has been reported[2], in Latin America, it is as high as 22%. From Peru primary resistance to INH of 7.3%, Rifampicin 1.5%, Streptomycin 73% and to combination of Rifampicin, NH and Streptomycin of 1.5% has been reported[3]. Primary resistance in Korea was found to be 3 1%[4] while in Haiti 32% of patients had resistant organisms to one or two antituberculosis drugs[5]. Haphazard use of antituberculosis thugs is common in Pakistan. Combination of Streptomycin and Penicillin is also in use for common infections. This study was undertaken at PMRC Research Centre at Khyber Medical College to document the prevalence of primary drug resistance to the commonly used antituberculosis drugs.

MATERIAL AND METHODS

From 3890 patients who attended the district Tuberculosis control centre during the period May 1981 to August 1983, 104 new patients were selected for the study. The criteria for selection were:
1. Patient with no history of previous antituberculosis treatment, or combination of Streptomycin, Penicillin (combiotic) for more than 5 days.
2. Chest X-ray showing a cavity or infiltrations in the upper lobe or upper segment of lower lobe or any other shadow consistent with the disease.
An early morning specimen of 10—20 ml sputum was collected from each patient. In patients who could not produce the required quantity, 24 hours collection of sputum was carried out. The sputum sample was transferred to a centrifuge tube with a screw cap. An equal volume of 1-cystemine sodium hydroxide was added, mixed well and the mixture allowed to stand for 30 minutes. Distilled water was then added and the mixture centrifuged at 3000 rpm for 30 minutes. A smear was prepared from the sediment and stained for acid fast bacilli. A portion of the sediment was also inoculated on to two tubes of Lowen Stein Jenson (U) slants. A third tube of Li. containing sodium salicylate was also inoculated for species identification. These L.J. Slants were incubated at 37°C and examined for growth at weekly intervals for maximum of 8 weeks. Colonies from positive cultures were trans ferred to a sterile tube containing 6-8 glass beads and 3 ml normal saline. The mixture was homogenised and then shaken for

10-15 minutes. Serial 10 fold dilutions were then prepared in sterile distilled water. These were inoculated on to drug containing media and incubated at 37°C for one week to study drug sensitivity patterns.

RESULTS

Of the 104 sputum samples studied, 32 (30.8%) gave a positive culture for mycobacterium tuberculosis (human). Of these eight were smear negative (Table).

TABLE
Proportion of Culture Positive Cases and Their Drug Sensitivity Pattern.

Total Cases Studied	=	104	
Culture Positive	=	32(30.8%)	
Smear and Culture Positive	=	24	
Smear Negative Culture Positive	=	8	

Name of Drug	Total Cases Tested	Sensitive	Resistant
Streptomycin	32	29	3(9.4%)
INH	32	27	5(15.6%)
INH & Streptomycin	32	30	2(6.2%)
Rifampicin	32	32	—
Ethambutol	32	32	—

The sensitivity pattern is thown in the table. ALl were sensitive to rifampicin and ethambutol. Three (9.4%) were resistant to streptomycin while 9(28%) exhibited resistance to INH. Two (6.3%) were resistant to the combination of INH Strep tomycin.

DISCUSSION

This study gives two important informations regarding tuberculosis in the area. Firstly, during the 18 months period of the study, of the 3890 patients registered at the T.B. Control Centre, only 104 (2.67%) were new cases. The rest were patients who had been visiting various clinics, practitioners and hospitals and had been taking irregular treatment. This shows that although case finding may be an

important problem in the management of the disease, case holding is a greater problem. Patient compliance and uniformity of treatment are aspects of the T.B. problem which require special consideration. Secondly, the initial drug resistance to commonly used antituberculosis drugs i.e., Streptomycin and INH is quite high. Previous studies in Pakistan showed a high resistance to S.M. , INH and PAS in treated cases[1]. In the study of Jafri, [2] drug resistance in untreated cases was not significant and this author concluded that the danger of spread of resistant bacffli in a population is more apparent than real. Snider et al[3] from USA have also reported that despite the widespread use of antituberculosis drugs, primary resistance is not increasing. This is attributed to the low pathogenicity of the drug resistant tubercle bacilli as compared to drug sensitive mycobacteria. Our study shows a high prevalence of primary drug resistance but since previous figures from this area are not available, we cannot comment whether any increase has occurred. Our results are comparable to those of Latin American and South East Asian countries[3-6]. The obvious explanation for the very high primary drug resistance prevalence in our population is due to irregular and inadequate use of drugs and low patient compliance.

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