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EVALUATION OF TUBERCULOSIS SENSITIVITY PATTERNS IN REACTION TO ANTI-TUBERCULOUS FIRST LINE DRUGS

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ABSTRACT

Objective: This study's main objective was to determine the tuberculosis sensitivity pattern for the first line of antibiotics. **Place and Duration of Study:** This study was conducted in Nishtar hospital Multan's Pulmonology department in 10 months between May 2019 and February 2020. **Type of Study:** Cross-sectional. **Materials and Methods:** Patients who were selected were older than 15 years without gender discrimination. Patients who had already used ATT were included in the exclusion criteria. For six weeks, the LJ medium was used for sputum analysis. Mycobacterium sensitivity was analyzed at the first antibiotic line. The standard doses used for LJ medium for sensitivity control were two mcg streptomycin, 100 mcg pyrazinamide, 0.2 mcg isoniazid, five mcg ethambutol, and one mcg rifampicin. **Results:** This study included a total of 115 cases. 72 (62.60 per cent) of these patients were males. Patients' average age was 35 years. Thirty-six (32.17%) drug resistance was observed, and in some cases, more than one drug was seen. Streptomycin was the most common medicine with resistance from Mycobacterium and included 19 (16.52%) cases. The second most common cause was isoniazid, with 17 (14.78 per cent). Resistance to only one drug was observed in 30 (26.08 per cent). Only 2 cases demonstrated resistance to 3 and 4 antibiotics. **Conclusion:** Almost every third case is TB resistant, and the highest resistance in streptomycin is observed.

KEYWORDS: MTB, Lowenstein Jensen medium, ATT.

INTRODUCTION

Tuberculosis is one of humanity's oldest diseases. In underdeveloped countries like Pakistan and India, the incidence rate is very high. Although the incidence rate initially declined in developed countries but with the increase in the incidence of HIV in developed countries is again on the rise. Site bases are classified as pulmonary or extra-pulmonary. Gold standard diagnostic research includes sputum culture, blood culture and radiological imaging of pulmonary tuberculosis. Extra-pulmonary tuberculosis is usually helpful in diagnosing EPTB. There are multiple diagnostic tests available, but gene Xpert is a gold standard and is less expensive than cultures. Initial standard therapy is four antibiotics, including rifampicin, ethambutol, isoniazid, and pyrazinamide. Streptomycin is injected in the first line of antibiotics. Various categories are available based on various MTB drug resistance. The therapy is very long, and these high-power antibiotics are linked to a variety of side effects. This long duration is the main reason for the development of resistance and reduced efficiency.

OBJECTIVE

This study's main objective was to determine the tuberculosis sensitivity pattern for the first line of antibiotics.

MATERIALS AND METHODS

This study was conducted in Nishtar hospital Multan's Pulmonology department in 10 months between May 2019 and February 2020. Patients who were selected were older than 15 years without gender discrimination. Patients who had already used ATT were included in the exclusion criteria. LJ medium was used for six weeks for sputum analysis. Mycobacterium sensitivity was analyzed in the 1st line of antibiotics. The standard dose of medications used in the LJ medium to check sensitivity was two mcg streptomycin, 100 mcg pyrazinamide, 0,2 mcg isoniazid, five mcg ethambutol and one mcg rifampicin.

RESULTS

This study included a total of 115 cases. 72 (62.60 per cent) of these patients were males. Patients' average age was 35 years. Thirty-six (32.17%) drug resistance was

observed, and in some cases, more than one drug was seen. Streptomycin was the most common medicine with resistance from Mycobacterium and included 19 (16.52%) cases. The second most common cause was isoniazid, with 17 (14.78 per cent). Resistance to only one drug was observed in 30 (26.08 per cent). Only 2 cases demonstrated resistance to 3 and 4 antibiotics.

Table 1: Study variables (n= 115).

Variable	Number	Percentage
Male	72	62.60%
Female	43	37.40%
Variable	**Mean ± SD**	**Range**
Age (years)	35.19±10.67	15-71
BMI (Kg/m2)	24.33±4.19	15-31
Duration of symptoms (months)	3.78±0.67	1-6

Table 2: Resistance to drugs (n= 115).

Drugs	Number	Percentage
Streptomycin	19	16.52%
Isoniazid	17	14.78%
Pyrazinamide	**5**	**4.35%**
Rifampicin	3	2.60%
Ethambutol	3	2.60%

Table 3: Number of drugs with resistance (n= 115).

Drugs	Number	Percentage
1 drug	30	26.08%
2 drug	07	6.08%
3 drug	**02**	**1.73%**
4 drug	02	1.73%
None	68	59.13%

DISCUSSION

Tuberculosis is one of humanity's deadly diseases, but a cure is possible with the development of modern drugs, which includes a long dosage and strict adherence. The emerging resistance to drugs caused by several factors, such as low patient conformity, lack of medicine, long-term duration and a high number of side effects, is the most critical problem. In the current study, 36 (32.17%) of drug resistance cases and more than one drug were found to be resistant in some cases. These results are in line with previous studies. A study conducted by Haq M et al. showed similar results that maximum numbers of cases showed streptomycin resistance in 19.05 per cent of cases. Second, isoniazid was most often observed in cases up to 14.9%, followed by ethambutol 3.4% and pyrazinamide 2.3%. The minimum resistance for rifampicin was observed, which included only 2,3% of cases. 6 The reason for high resistance can be attributed to the fact that the first drug for treating TB was streptomycin and that a high exposure rate led to resistance development. 18 30 (26.08%) cases showed resistance to only one drug in our study. 2 (1.73 per cent) cases had three and four resistance cases. Almost 4.8 per cent of all TB cases, as shown by WHO, have one or more drug resistance. The largest number of resistant TB cases in India and China reaches 50%. Pakistan is 4th among the rankings of tuberculosis resistant cases. The excessive abuse of streptomycin in straight infections in remote areas that led to increased resistance is attributed to this high incidence of resistant TB strains.

CONCLUSION

Nearly every third case is TB resistant, and streptomycin has the highest resistance.

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