

Functional Outcomes in tuberculosis of spine including drug resistance tuberculosis of spine



Medical Science

KEYWORDS: Functional outcome, drug resistance, tuberculosis of spine

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ABSTRACT

Spinal tuberculosis is most common extra pulmonary manifestation. Spinal tuberculosis causes disability starting from limitation of daily activity to complete disability to patient. Due to emergence of development of resistance to first line drugs and some second line drugs, it is very important to diagnose these resistant cases and treat them with sensitive second line drugs and with operative management. In our study, patients have been followed up after getting drug sensitivity testing of individual patient. Each patient was treated with operative and medical management with antitubercular drugs. After 2 years, MDR tuberculosis of spine cases are increasing, patients who are having MDR tuberculosis are given second line drugs for 24 months of duration. As duration of treatment is more in MDR tuberculosis, incidence of side-effects are high. Most of patients who were diagnosed MDR tuberculosis of spine that have been started second line drugs also had good functional outcomes. Proper medical and surgical management of tuberculosis of spine including drug resistance tuberculosis can lead to excellent to good outcomes.

Introduction

Spinal tuberculosis is most common extra pulmonary manifestation. Spinal tuberculosis causes disability starting from limitation of daily activity to complete disability to patient. Due to emergence of development of resistance to first line drugs and some second line drugs, it is very important to diagnose these resistant cases and treat them with sensitive second line drugs and with operative management.

Materials and Methods

Our study is combined prospective and retrospective study. We had included 36 patients from indoor patients in whom tuberculosis of spine diagnosed in our hospital.

After growth of bacilli, drug sensitivity testing done using **BAC-TEC MGIT 960 kit (mycobacteria growth indicator tube)** for Isoniazid and Rifampicin. Drug sensitivity testing takes 4-14 days for results.

Patients have been followed up after getting drug sensitivity testing of individual patient. Each patient was treated with operative and medical management with antitubercular drugs.

Final Outcome Is Assessed Using:

- Neurological Component
 - VAS Scale for Back pain and Leg pain
 - Claudication Distance
- Radiographical criteria
 - Bridwell grading for Fusion
- Functional Ability
 - LIN'S Criteria

Results

In our study, 36 patients were having tuberculosis of spine have evaluated for drug resistant pattern, samples were collected either intraoperatively or USG/CT guided aspiration. Out of these 36 patients, 14 patients are having resistance to one or more First line drugs & rest 22 patients are sensitive to First line drugs.

Gender incidence

In Our study we have included 22 females and 14 males. Most of our patients belong to productive years of life. Two patients were below 20 years of age. Out of 14 male patients, 4 patients have resistance to Isoniazid, Rifampicin or both. And out of 22 females, 10 have resistance to Isoniazid, Rifampicin or both.

MDR TB: Patient who has resistance to both Isoniazid & Rifampicin

Resistance to other first line drugs: Patient who had resistance to Isoniazid or any other First line drugs. (except MDR)

Resistance to first line drugs

In our study involving 36 patients 13 patients were having resistance to Isoniazid, 7 pts were having resistance to Rifampicin, 3 pts were having resistance to Ethambutol and 2 pts were Streptomycin.

Table 1

Drug	No of patients	Percentage
Isoniazid	13 (7 MDR)	36.12%
Rifampicin	7 (all MDR)	19.45%
Ethambutol	3 (2 MDR)	8.30%
Streptomycin	2 (both MDR)	5.50%

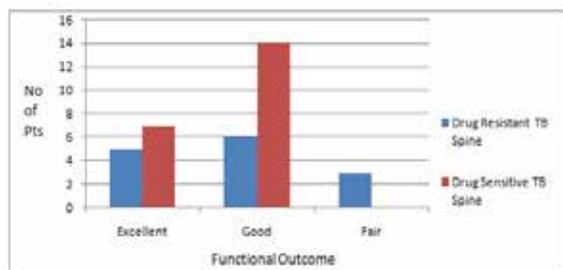
Percentage of pain scale in patients

In our study at the end of 6 months, 17 patients have no complaint of pain. 18 patients have mild pain & one patient has moderate pain.

Functional outcomes in patients

In our study, Excellent functional outcome have been found in 20 patients, out of which 5 were having Drug Resistant Tuberculosis of Spine. Good functional outcome have been found in 13 patients, out of which 6 pts had drug resistant tuberculosis of spine. Fair Functional outcome have been found in 3 pts all these 3 patients had drug resistant tuberculosis of spine.

Chart 1



Radiological Healing

In our study out of 36 patients, 11 patients were having Grade I fusion (Definite) & 24 patients were having Grade II Fusion (Probable)

Comparison with other Study

We had compared our study with another study in which they had studied pattern in 111 patients of drug resistant TB of spine using BACTEC MGIT 960 system conducted in Hinduja Hospital, Mumbai.

Resistance Pattern	Hinduja Hosp Study	Our Study
Isoniazid	16.72%	36.12%
Rifampicin	14.77%	19.45%
Ethambutol	9.3%	8.3%
Streptomycin	12.5%	5.5%
MDR TB	12.95%	19.44%

Discussion

Tuberculosis of spine is widely prevalent in developing countries like India. And anti tuberculous therapy is mainstay for treatment of spinal tuberculosis. It is quite necessary to detect sensitivity of anti tuberculous drugs for their effectiveness.

The Study was conducted in our Hospital. Cases have been selected from indoor and outdoor patients who were diagnosed to have tuberculosis of spine.

Drug-resistant TB have microbial, clinical, and programmatic causes. From a microbiological perspective, the resistance is caused by a genetic mutation that makes a drug ineffective against the mutant bacilli. An inadequate or poorly administered treatment regimen allows drug-resistant mutants to become the dominant strain in a patient infected with TB. However it should be stressed that MDR-TB is a man-made phenomenon – poor treatment, poor drugs and poor adherence lead to the development of MDR-TB. In our study of 36 patients, 13 patients had resistant to Isoniazid and 7 patients were MDR resistant to both Isoniazid and rifampicin. In addition 2 patients were resistant to streptomycin and 3 patients were resistant to ethambutol.

MDR and other drug resistant cases

We had found equal percentage of MDR and other drug resistant case of tuberculosis of spine Multi drug resistant tuberculosis have resistant to both most important first line drugs Isoniazid and Rifampicin.

Patients with having resistance to Isoniazid,they should be given levofloxacin for 6 months.

Patients with having resistance to both Isoniazid and Rifampicin, they have given category 4 regimen that includes injection kanamycin, cycloserine, ethionamide, pyrazinamide, ethambutol, levofloxacin for 6 months and in continuation phase ethambutol , ethionamide ,cycloserine and levofloxacin are given for further 18 months. They should be followed-up regularly for patient’s compliance & improvement in symptoms & general condition radiological healing.

Functional outcomes

In our study all the patients with Tuberculosis of spine were treated with both medical & operative management .we had operated each patient for posterior fixation &/ anterior reconstruction depending upon indication in each patient. After culture sensitivity report, each patient with drug resistance was started sensitive second line drugs, and followed –up regularly for patients ’ compliance and subsidence of symptoms .Most patients even with drug resistant tuberculosis of spine had good functional outcomes.

All patients with tuberculosis of spine should be treated with medical management and operative management depending upon indication; it may lead to good functional outcomes even in patient with drug resistant tuberculosis of spine.

We have compared our study with another study, they had studied **drug resistant pattern in 111 patients of drug resistant tuberculosis of spine using BACTEC MGIT-960 System which was conducted in Hinduja Hospital, Mumbai by Kapil Mohan et al.** They had taken 111 cases of drug resistant among 684 positive culture patients. They were found resistant to Isoniazid in 103 patients (16.72%), rifampicin in 91 patients (14.77%), MDR in 90 patients, ethambutol in 57 patients (9.3%) and streptomycin in 77 patients (12.5%). They have also studied drug sensitivity pattern for **second line drugs** but we could not include second line drugs because patients included in our study were mostly belonging to poor economic class and we have studied drug sensitivity pattern for first line drugs in **Tuberculosis laboratory centre** in our Hospital. In our study involving 36 patients 13 patients were resistant to Isoniazid (36.12%), 7 were resistant to Rifampicin (19.45%), 3 were resistant to Ethambutol (8.3%) & 2 were resistant to Streptomycin. (5.5%)

Results of both studies were almost similar **but we had found more percentage of resistance to first line drugs in patients with tuberculosis of spine.** The difference between results may be due to different area of study, difference in prevalence of drug resistant pulmonary tuberculosis in different area. **Most patients had resistance to isoniazid followed by rifampicin, ethambutol, Streptomycin.** Isoniazid and rifampicin are bactericidal and most important first line drugs. So patient with tuberculosis of spine who were having resistant to both of these drugs should be started category 4 regimen combined with operative intervention.

Conclusion

Tuberculosis of spine is very common in developing countries like India and nowadays there are increasing numbers of drug resistant tuberculosis of spine that affects patients treatment course and final outcome for the patient. And for diagnosis of drug resistant tuberculosis spine, culture of tuberculosis bacilli is mandatory.

Sample collection for diagnosis of resistant spine is done per-operatively or through ultrasound or CT guided aspiration. Culture of bacilli takes average two months, then drug sensitivity testing is done for tuberculosis bacilli and according to sensitivity of drugs for individual patient, further treatment is started. Newer techniques are developed that can detect drug resistance in tubercular bacilli early and lead to early detection and proper

treatment of drug resistant tuberculosis.

MDR tuberculosis of spine cases are increasing, patients who are having MDR tuberculosis are given second line drugs for 24 months of duration. As duration of treatment is more in MDR tuberculosis, incidence of side-effects are high.. Most of patients who were diagnosed MDR tuberculosis of spine that have been started second line drugs also had good functional outcomes.

Proper medical and surgical management of tuberculosis of spine including drugs resistance tuberculosis can leads to excellent to good outcomes.

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