

To Evaluate the Efficacy of Short Term Intermittent Chemotherapy in Spinal Tuberculosis

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ABSTRACT

Introduction: Noncompliance in the treatment of spinal tuberculosis (ST) can lead to treatment failure followed by occurrence of drug resistance. In order to improve compliance, a short-course treatment with direct observation of drug intake is required. Very few authors have evaluated the efficacy of World Health Organization recommended Directly Observed Treatment Short Course (DOTS) strategy in osteoarticular tuberculosis. The present study was done to evaluate the efficacy of short term intermittent chemotherapy in directly observed treatment short-course intermittent (DOTS) regimen in spinal tuberculosis.

Material and Methods: A prospective study was performed on 24 patients with spinal tuberculosis from October 2008 to June 2010 in the Department of Orthopedics, DDU Hospital, New Delhi. All the patients were given the DOTS regime as recommended by WHO and followed up at intervals of one month during the treatment for assessing the clinical improvement and compliance to the therapy.

Results: In present study, there were 41.66% males and 58.33% female patients. Lumbar spine was most commonly involved [10 (42%)], followed by dorsal spine [6 (25%)]. ESR was found to be elevated in all patients. CRP was positive in 45.5% patients. Sixteen (80%) patients have shown increase in weight at the end of 6 month treatment. Clinical improvement was seen in all patients and 87.5% patients were fully compliant to the therapy.

Conclusion: DOTS intermittent therapy was effective in spinal osteoarticular tuberculosis and should be given for at least 8 to 10 months.

Keywords: Short term intermittent chemotherapy, spinal tuberculosis, DOTS regimen

INTRODUCTION

The prevalence of spinal tuberculosis (ST) is high in India and has become a one of the leading cause of morbidity and mortality.¹

The management of ST requires multifaceted approach including drugs alone or combined with surgery along with drugs. Now a day's drug treatment is recommended in specific indications to majority of patients with surgery.²

Irregular treatment with even effective drugs is associated with poor outcome in case of spinal tuberculosis.³

Now, World Health Organization (WHO) has recommended Directly Observed Treatment Short Course (DOTS regimen) for ST.⁴ It is based on intermittent drug intake and short-course therapy along with good management practices.

A study done by Chen et al reported the effectiveness of DOTS regime in patients having spinal tuberculosis.⁵

The present study was done to evaluate the efficacy of short term intermittent chemotherapy in DOTS regimen in patients of spinal tuberculosis.

MATERIAL AND METHODS

The present prospective study was done from October 2008 to June 2010 in the Department of Orthopedics, DDU Hospital, New Delhi. The study included 24 patients below 70 years of age who had spinal tuberculosis. A Written informed consent from all the patients and Ethical Committee approval was obtained before starting the study.

Cases of ST with immuno-compromised status such as HIV, cancer, severe protein energy malnutrition, diabetes or renal failure, age group of more than 70 years, defaulter and treatment failure cases, tuberculosis patients taking immunosuppressive drugs and cases of ST during pregnancy were excluded from the present study.

Investigations including blood, C-reactive protein, chest X- ray PA view, X-ray of the affected part of the body, Zeihl-Neelson and gram stain of aspirate /pus /tissue were performed.

MRI of affected part and polymerase chain reaction was done in selective cases who were not diagnosed by above mentioned routine investigations.

In doubtful cases of ST tissue biopsy was considered if the site is easily accessible without causing much morbidity to the patient to establish the diagnosis.

If the clinical condition of patient did not improve even after intensive phase and there was suspicion of multiple drug resistance then culture and sensitive of aspirate was done for diagnosis and guiding the therapy.

On the basis of investigations and clinical correlation the treatment was started. The DOTS regime recommended by WHO for ST category I patients was followed i.e. 2(HRZE)3 + 4(HR)3. Extension of the intensive phase was done for one month depending upon the response in clinical condition.

Surgery of the affected part was considered if a lesion was not responding favorably to the ATT or as advocated in the "Middle Path Regime" or if there was any doubt in diagnosis. The surgical intervention was done as per the conventional indications.

All the patients were regularly followed up at intervals of one month during the treatment for assessing the clinical im-

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provement and compliance of the patient.

The improvement was assessed with radiographs and heamogram with ESR and C-reactive protein at the interval of one month till the treatment was completed. The other clinical parameters such as increase appetite, weight gain, absence of other constitutional symptoms was also taken into account. Clinical parameters for evaluation include subjective sense of well being, improvement in constitutional symptoms like fever, anorexia, lassitude, subjective decrease in pain and gain in weight, decrease in size of abscess, healing of sinus, erythrocyte sedimentation rate and radiological sign of healing.

After completion of treatment patients were called at interval of every three month and assessed to find local recurrence of ST.

STATISTICAL ANALYSIS

All the data were analyzed using IBM SPSS- ver.20 software. Analysis was performed using chi-square test and independent sample student t test. P values <0.05 was considered to be significant.

RESULTS

In present study, there were 10 (41.66%) males and 14 (58.33%) females.

All patients (100%) had an elevated ESR at the time of presentation.

Among the spinal tuberculosis cases, 15 (63%) patients had a positive picture on X-ray and 9 patients had a positive picture on MRI.

Distribution of lesions in patients of ST revealed that lumbar spine was most commonly involved 10 (42%) patients, fol-

lowed by dorsal spine 6 (25%). Other places involved were dorsolumbar [5 (21%)], lumbosacral [1 (4%)], cervical [1 (4%)] and cervico-dorsal [1 (4%)].

3 patients had positive history of pulmonary Koch's and 1 had active disease.

Spinal tuberculosis patients were started on WHO DOTS category-I. Clinical evaluation and estimation of weight, ESR and CRP was done every month.

Duration of treatment extended in 16 (66.66%) cases of spinal tuberculosis. 8 (33.3%) patients were given 6 months of treatment. Eleven (46%) patients were given 7 months of treatment, 2 (8.3%) patient were given 8 months of treatment, 2 (8.3%) patients were given 10 months of treatment and 1 (4.1%) patient was given 12 months of treatment. Clinical improvement was seen in all patients and 87.5% patients were fully compliant to the therapy.

DISCUSSION

World health organization has recommended the use of short-course chemotherapy (SCC) in ST in developing countries.⁶ Previous studies done by Konstam et al and Hahn MS reported no difference in gender distribution of the of the disease^{7,8} Present study had also not found any gender difference in spinal tuberculosis ($p>0.05$).

Watts et al did a study and showed that age distribution of tuberculosis was based on the endemicity of disease.⁹ In present study, skewedness of the disease towards young population signifies the endemicity of ST in our country.

In present study, young working class patients were mostly affected. However, close observation revealed that the ST involved housewives more (38%). This pattern might be due to the higher stress to the spine in case of housewives.

Previous studies have reported pain as the most common presenting symptom in their patients of ST. It was there in all of our patients.^{9,10} Among the ST patients, the most common presenting feature was constitutional symptoms (88%) and cold abscess was found in (25%) of cases.

In present study, elevated ESR was found in all the patients. But workers around the world are not in unison regarding the usefulness of ESR as an indicator of disease activity.^{9,11} A study done by Vaughn KD found an elevated ESR whereas Watts et al reported that ESR remained low in diseased patients and is non-specific in nature.^{9,11} Although ESR values fluctuate between a wide ranges, in present study an elevated value of ESR was observed along with presence of constitutional symptoms, both can be regarded as the important index of disease activity.

The reason why the present study had preferred ESR as marker of activity because consistently fall of ESR closely followed the activity of disease in majority of patients in first few months of treatment when even MRI was unable to

Parameters		ST
Age	<40	22 (91.66)
	≥40	2(8.330)
Gender	Male	10 (41.66)
	Female	14 (58.33)
Occupation	Students	6 (25)
	Housewife	9 (37.5)
	Manual worker	6 (25)
	Service	3 (12.5)
	Pre-school	0(0)
Clinical feature	Pain	20 (83)
	Constitutional symptoms	21 (88)
	Palpable abscess	6 (25)
	Neurological deficit	9 (38)

Data is expressed as no of patients (%), ST; spinal tuberculosis, EST; extra spinal tuberculosis

Table-1: Distribution of patients according to different parameters

Months			0	1	2	3	4	5	6	T-3	T-6	T-9	T-12
ST (n=24)	ESR*	M	62	49.6	37.3	30.4	25.2	29.3	27.9	17.7	16.9	16.4	15.7
	CRP	+ ve	10	2	1	0	0	2	1	0	0	0	0
	WG	M	45.5	46.9	47.8	48.9	48.8	48.8	50	50.3	50.9	51.5	51.8

*6 month of ATT, M; mean, N; no of patients, +ve; positive cases, ESR; erythrocyte sedimentation rate, CRP; C-reactive protein, WG; weight gain in Kg, ST; spinal tuberculosis

Table-2: Follow up of patients on therapy

show the healing changes and assessment of improvement was purely clinical. Also ESR estimation is cheap, save time and provide reproducible results.

All patients were started treatment with short term intermittent chemotherapy as per WHO recommendations.

There was significant relief in pain and also reduction in ESR at the end of 2nd month in all the patients. ESR was within normal limit at the end of treatment.

All 24 patients of ST showed signs of recovery as observed by ESR on follow up. Of these, 8 (33%) did not show any further deterioration afterwards till the termination of the treatment at 6 months. The remaining 16 patients (67%) showed some kind of deterioration during the continuation phase.

In present study, the fall in ESR at the end of 2 months was not significant, however at the end of 6 month was found to be significant. This implies that the fall in ESR value is not by chance in all forms of tuberculosis whether spinal or extra spinal tuberculosis. So, we can safely say that the spinal tuberculosis requires longer duration of therapy than the extra spinal tuberculosis as 87.5% patients required 6-8 months of chemotherapy.

In our study weight gain was found to be a very useful indicator of clinical improvement. Among the ST patients, 83% (21/24) had shown increase in weight gain after six months of treatment and all patient had shown weight gain after 1 year of treatment completion.

In present study all the patients had shown improvement, but for 66.66% patients treatment duration was extended.

The present study had few limitations like small sample size. Follow-up period was short. A prolonged follow-up of 5-10 years is essential to ascertain the actual rate of relapse.

CONCLUSION

Spinal tuberculosis is common orthopaedic problem in India that can be diagnosed early with judicious use of clinical evaluation. DOTS treatment needs to be titrated depending on the clinical, lab finding and radiological evidence. As per our observation spinal tuberculosis should be given at least 8 to 10 months of DOTS treatment.

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