Tuberculoma of the Central Nervous System: Optimal Treatment and Post-Surgical Management

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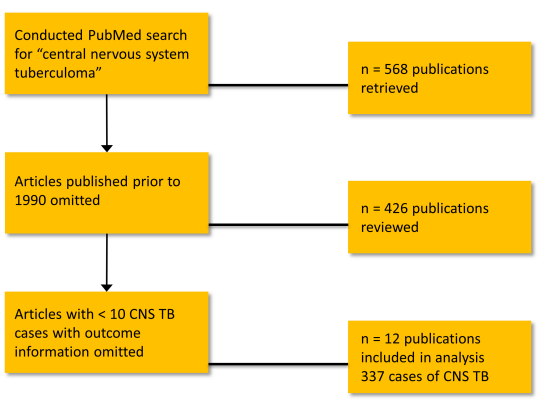
Introduction

Tuberculosis remains one of the most lethal infectious diseases with nearly 9 million new cases and 1.5 million lives claimed each year. Central nervous system tuberculosis (CNS TB) is the most devastating manifestation of tuberculosis. An estimated 90,000 cases of CNS TB presented in 2010 and worldwide prevalence is currently on the rise[1]. Diagnosis of CNS TB remains challenging due to the insidious nature of the infection. The aim of this study was to identify the ideal diagnosis and treatment strategy for CNS TB, measured by overall patient outcome, through a systematic analysis of the published literature.

Methods

An English language search was conducted through PubMed using the terms "central nervous system tuberculoma." Institutional experiences and studies of at least 10 patients with CNS TB, published between January 1990 and May 2012 with treatment and outcome information were included. Parameters including demographic information, anatomical location, treatment modality, follow up time, and overall clinical outcome were recorded.

CNS TB Study Inclusion Flow Chart



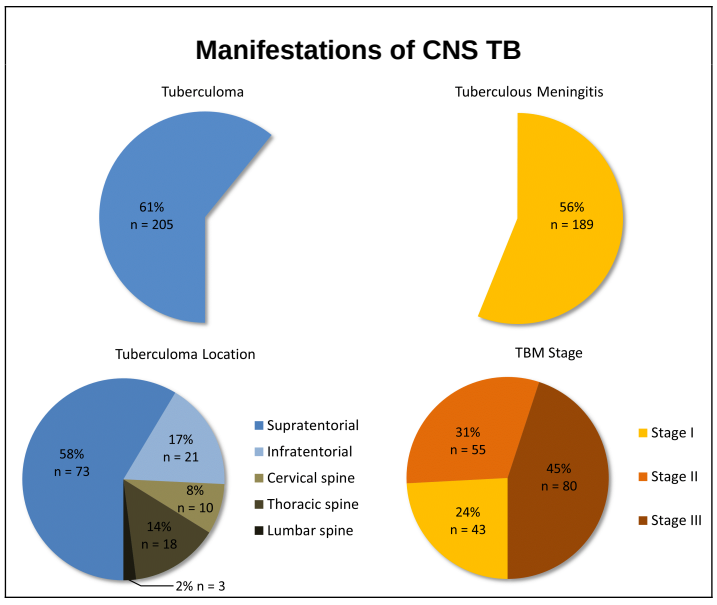
Results

337 cases of CNS TB were identified in 12 published studies. The mean age at presentation was 26.3 years and 177 (53%) were male. 205 (61%) of the patients presented with tuberculoma and 189 (56%) had tuberculous meningitis. Imaging findings included diffuse basal enhancement and ring enhancing lesions. Anatomical location of tuberculoma was 58% supratentorial, 17% infratentorial, 14% thoracospinal, 8% cervicospinal, and 2% lumbospinal. Surgical intervention was performed in 133 (39%) of the cases, and anti-tuberculosis chemotherapy (ATT) was administered in 237 (70%) cases for an average duration of 14.4 months. Average follow up time was 17.9 months. 133 (40%) patients experienced symptom free recovery, 40 (12%) died and 113 (34%) retained neurological deficit at the time of follow up.

References

[1] WHO. Global Tuberculosis Control 2011. In: WHO, ed. World Health Organization. Geneva; 2009:1-258.

Manifestations of CNS TB



Conclusions

Diagnosis of CNS TB remains challenging using noninvasive methods. Therefore, obtaining biopsies of suspected lesions is invaluable in distinguishing tuberculomas from pyogenic abscesses or malignant neoplasms. In the absence of extraneural lesions, image guided stereotactic biopsy is preferred to open biopsy. Neurosurgical referral is indicated in cases with intracranial hypertension or intractable seizures. While medical treatment provides excellent results in the majority of cases, surgical excision may prove beneficial in facilitating symptomatic recovery in cases of intraventricular and intramedullary tuberculoma. Maintaining suspicion of CNS TB is essential to achieve an accurate diagnosis and expedite the appropriate treatment.

Learning Objectives

1) Describe the importance of early diagnosis and treatment in central nervous system tuberculoma.
2) Discuss, in small groups, the relevant findings of this study, and present interesting questions to be addressed in future investigation.
3) Identify an effective treatment strategy for intracranial and spinal tuberculoma.

Clinical Characteristics and Outcome

	# of cases	(%)		# of cases	(%)
Male:Female Ratio	177:160	53:47			
Age at Presentation (Years)	26.3		Diagnosis		
Form of CNS TB			CT	168	50%
Tuberculoma	205	61%	MRI	27	8%
Supratentorial	73	58%	Histology	74	22%
Infratentorial	21	17%	CSF Culture/Smear	63	19%
Cervical Spinal	10	8%	PCR	14	4%
Thoracic Spinal	18	14%	HIV +	11	3%
Lumbar Spinal	3	2%	Treatment		
Tuberculous Meningitis	189	56%	ATT	237	70%
Stage I	43	24%	ATT Duration (Months)	14.4	
Stage II	55	31%	Surgical Intervention	133	39%
Stage III	80	45%	Outcome		
Presenting Symptoms			Follow Up (Months)	17.9	
Headache	68	20%	Excellent Recovery	133	39%
Seizure	75	22%	Neurological Sequelae	113	34%
Neurological Deficit	101	30%	Mortality	40	12%