

# Autonomic Function Test in Tuberculous Meningitis with Erectile Dysfunction : A Case Report

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## ABSTRACT

Tuberculous meningitis (TBM) is associated with many complications. We describe a case of TBM with erectile dysfunction (ED) in a 39 year old Asian male. He had fever and chills one year back. Increase TLC and mild deranged LFT was found. Patients managed with antibiotics, antipyretics, fluids and symptomatic management. His culture and sensitivity for microfilariæ came positive. He was given DEC. Antihypertensive treatment was also given. He was started on anti-tuberculous therapy and continued till 14 months. He had an uneventful recovery and was followed up for the past one year. His autonomic dysfunctions were seen on investigation.

**Keywords:** Tubercular meningitis, Autonomic function test.

## INTRODUCTION

Tuberculous meningitis (TBM) is associated with significant morbidity and mortality.<sup>[1]</sup> The approximate mortality due to TBM in India is 1.5 per 100,000 population.<sup>[2]</sup> It is difficult to diagnose TBM accurately in the peripheral health or medical institutions in the country. Diagnosis of TBM is often delayed due to late presentation with atypical clinical features. Other neurological complications associated with TBM are stroke, seizure, hydrocephalus, vision impairment, and hearing impairment.<sup>[3]</sup> The best ways to reduce mortality and morbidity associated with TBM are the timely diagnosis, recognition of complications, and appropriate treatment.<sup>[1]</sup>

In our case report, we have discussed a TBM patient with erectile dysfunction(ED) who improved on treatment. This report helps to highlight the role of timely diagnosis of complicated TBM with unusual presenting symptoms in reducing morbidity.

## Case Report

A 39 year old married male was admitted in causality with complain of fever for one month which was acute in onset, initially low grade and

then high grade fever. And he also had history of headache for 20 days which was acute in onset and progressive in nature and associated with vomiting. He had been admitted for detailed evaluation and further management. On the basis of history and examination sub acute meningitis suspected and investigated. He was diagnosed as a case of TBM based on cerebrospinal fluid (CSF) detailed report. His CSF had raised protein, low sugar and Lymphocytic pleocytosis. His CT head, MRI Brain and GENE expert was normal. He had managed conservatively and was being discharged with following advices. He was also diagnosed as hypertensive and antihypertensive treatment was started. He was started on Akurit ( Isoniazid 75 mg, Rifampicin 150 mg, Ethambutol 275mg, Pyrazinamide 400mg) 4 OD BBF, Tab Benadon ( Pyridoxine) 40 mg half OD, Tab Wysolone ( Prednisolone ) 40mg 1 OD After BF, Syp Arachitol Nano (Vit. D3 oral solution) 5 ml OD for 5 days then once weekly for 12 weeks and Tab Cefum ( Cefuroxime) 500mg 1BD for 5 days. After getting discharge, he developed atypical chest pain. Then again he was admitted to hospital and further investigations were done. ECG was normal. Angiography showed 35% stenosis of the lumen. Autonomic function tests were performed using three channels physiograph (AD Instruments). Following tests were performed:

- Heart rate variability : LF, HF, LF/HF ratio & LF/HF ratio power
- Heart rate response to standing (30:15 ratio)
- Heart rate response to deep breathing

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- Heart rate response to Valsalva Manoeuvre
- Blood pressure response to sustained hand grip exercise

Poincare plot of R-R interval showing relationship between sympathetic and para sympathetic nervous

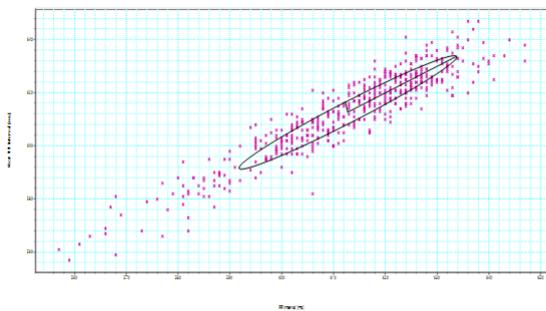
activity. (SD1 = 4.17 ms, SD2 = 22.58 ms) SD1 indicates parasympathetic activity while SD2 indicates sympathetic activity. The point care plot of this patient shows increased SD1 indicating increased sympathetic activity. The results of tests are shown in the table

**Table 1: Heart rate variability**

Case	SDNN (ms)	RMSSD (ms)	LF (ms <sup>2</sup> )	HF (ms <sup>2</sup> )	TP (ms <sup>2</sup> )	LF/HF ratio
1	16.24	5.892	52.3	21.09	203.9	2.48

**Table 2: Other autonomic function tests**

Case	Age (years)	30:15 ratio	Heart rate response to deep breathing		Valsalva ratio	DBP (mmHg) Change on hand grip
			E/I ratio	Deep breathing difference (DBD) (Beats per minute)		
1	39	1.11	1.10	9	1.54	2



**Figure 1: Point care plot**

## DISCUSSION

The aim of this study was to investigate the integrity of the autonomic control mechanisms in patients with tubercular meningitis with erectile dysfunction. The ANS alterations, reflected as increased sympathetic and decreased parasympathetic activity.<sup>[4]</sup>

### Heart Rate Variability

In this case HF was decreased very much, LF/HF ratio was more than 2 indicating decreased parasympathetic drive. [Table 1]

Another method of HRV analysis is the Poincare plot, which is a ‘scatterplot’ of current cardiac cycle length (the R-R interval on the ECG) against the preceding R-R interval.<sup>[5]</sup> The Poincare plot allows a real time display of inter-beat intervals at the time the patient is being monitored and can thus provide a visual measure of parasympathetic nervous system activity.

### Other Autonomic Function Tests

30:15 ratio, E/I ratio, DBD and valsalva ratio was normal in the case. BP response to sustained hand grip exercise was found to be less than normal i.e. abnormal sympathetic response. [Table 2]

SD2/SD1 describes sympathovagal balance.

Above results showed that autonomic function in patients with TBM were deranged as reflected by erectile dysfunction and cardiovascular abnormality

as 35% blockade shown in angiography and have been associated with reduced HRV. Causes of erectile dysfunction can be local or systemic, one of which is ANS dysfunction. Other studies have shown that individuals with ED, compared to healthy controls, display a relative diminution of parasympathetic activity and an increase in sympathetic activity of the ANS.<sup>[6-9]</sup> These sympathovagal disruptions have been typically reflected as greater high frequency component in low-frequency: high frequency ratio (a HRV parameter reflecting the balance of ANS; higher values denote increase sympathetic activity and cardiac dysregulation, whereas lower values show increased parasympathetic activity) among patients compared to control group.<sup>[10-11]</sup> ANS dysfunction can be immune mediated response as shown in other study done by Bernhard. ANS dysfunction may be disease related or treatment cannot be explained by this study.<sup>[12]</sup> Further studies are required.

## CONCLUSION

Autonomic dysfunctions are seen in patients with TBM. By reviewing the literature it is clear that timely identification and accurate management can treat and prevent TBM complications.

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