

Introduction

Meningitis, the inflammation of the meninges covering the brain and the spinal cord, is the most common infectious disease of the CNS. Infection with bacteria, viruses, or other microorganisms is the common underlying cause of meningitis.

Acute bacterial meningitis (ABM) in adults is associated with a mortality that may exceed 30%. If untreated, it may result in serious long-term complications. However, acute viral meningitis (AVM), which often has a better prognosis and does not require antibiotics, is the main differential diagnosis of ABM.

According to WHO guidelines, CSF analysis is essential to establish the diagnosis, distinguish bacterial from non bacterial meningitis, and identify the etiological agent. Unfortunately, to date, no single laboratory test is able to distinguish bacterial meningitis from non-bacterial meningitis with high accuracy; and the most precise combination of clinical features to raise or lower suspicion of meningitis is still indistinct.

Lipocalin-2 (LCN2) is a small protein of 22 kDa involved in iron homeostasis that allows an alternative method of transferrin to deliver iron to the cytoplasm. It allows sequestering iron by interfering with siderophore-mediated iron acquisition by bacteria. There was a paucity of previous studies suggesting that LCN2 can be used in diagnosing bacterial meningitis.

Here, we studied the efficacy of LCN2 to differentiate between bacterial and non-bacterial meningitis.

Aim of the work

The aim of this work was to study the diagnostic role of CSF lipocalin2 in differentiation between bacterial and non-bacterial meningitis.

Patients and Methods

This study was a prospective comparative study which was conducted at Alexandria Fever Hospital, on 40 Patients who were divided into two groups.

Group A: 20 patients with clinical manifestations and positive CSF criteria of suspected bacterial meningitis.

Group B: 20 patients with clinical manifestations and positive CSF criteria of suspected non-bacterial meningitis.

Results

The mean CSF Lipocalin-2 value was significantly elevated in bacterial meningitis patients with a median of 22.90 (15.0 – 30.2) ng/ml compared to non-bacterial meningitis patients with a median of 3.10 (1.20 – 10.30) ng/ml (p <0.001).It was statistically significant in detection of bacterial meningitis patient with AUC was 0.961 (0.911 to 1.011) (p< 0.001), the cutoff point of LCN2 >11ng/ml with excellent sensitivity 95% (95% CI 75.1-99.9) and specificity 85% (95% CI 62.1-96.8).

Table : Comparison between the two studied groups according to lipocalin-2 levels in CSF

Lipocalin2	Group A (n = 20)	Group B (n = 20)	U	p
Min. – Max.	10.80 – 44.20	1.0 – 17.0	15.50*	<0.001*
Mean ± SD.	23.11 ± 9.05	5.53 ± 5.15		
Median (IQR)	22.90 (15.0 – 30.2)	3.10 (1.20 – 10.30)		

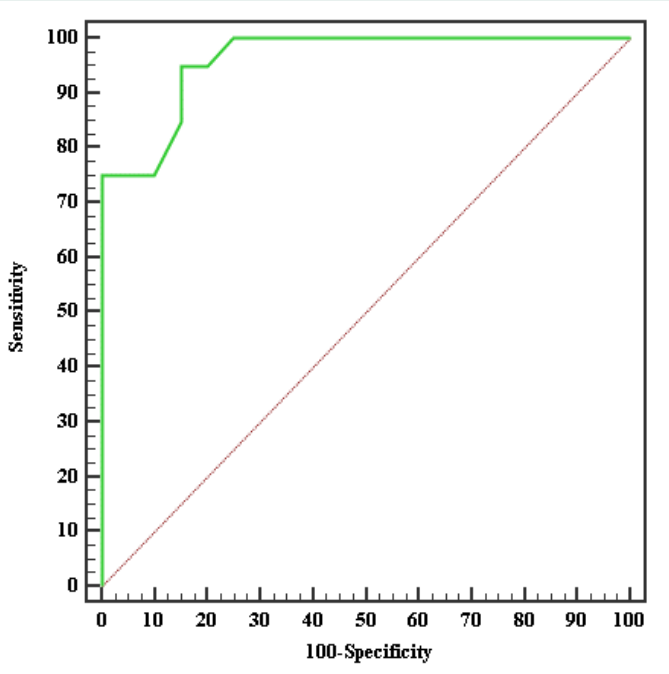


Figure: ROC curve for CSF Lipocalin2 to discriminate bacterial meningitis patients (n = 20) from non-bacterial (n = 20)

Conclusion

Our data suggested that CSF LCN2 level is a simple, rapid marker that can be used for diagnosing acute bacterial meningitis. In addition, CSF LCN2 is able to discriminate between acute bacterial meningitis and acute non-bacterial meningitis on admission.