

THE DIAGNOSTIC ROLE OF CEREBROSPINAL FLUID LEUCINE-RICH ALPHA-2 GLYCOPROTEIN IN DIFFERENTIATION BETWEEN BACTERIAL AND ABACTERIAL MENINGITIS

Nasser Mohamed Abdullah, Nermeen Sherif Abdeen, Raghda Saad Zaghloul Taleb,* Noha Osman Osman Abdel Reheem
Department of Tropical Medicine, Department of Clinical and Chemical Pathology,* Faculty of Medicine, Alexandria University

Introduction

Meningitis is the infection of the meninges. It can arise from various pathogens, such as bacteria, viruses and fungi, but bacterial meningitis has the greatest worldwide burden. Fever, headache, vomiting, neck stiffness, photophobia, blurred vision, convulsions and altered mental state are the most predominant symptoms of meningitis. Cerebrospinal fluid analysis is the main diagnostic test for meningitis. Bacterial meningitis is a critical medical condition that necessitates prompt diagnosis and urgent treatment. It is caused mainly by Streptococcus pneumoniae and Neisseria meningitides. Abacterial Meningitis may be caused by viruses, fungi and parasites. Viral meningitis is caused mainly by Non-polio enteroviruses. It generally follows a harmless course and exhibits spontaneous recovery. Leucine rich alpha-2 glycoprotein (LRG) is a newly discovered biomarker that can be used to identify inflammatory disorders. It is composed of 312 amino acid residues, with 66 of these being leucines. Based on data, we hypothesize that LRG may be a promising new addition to the cytokine network, contributing significantly to the inflammatory process.

Aim of the Work

This study aimed to assess the diagnostic efficacy of cerebrospinal fluid leucine-rich alpha-2 glycoprotein in distinguishing between bacterial and non-bacterial meningitis.

Patients and Methods

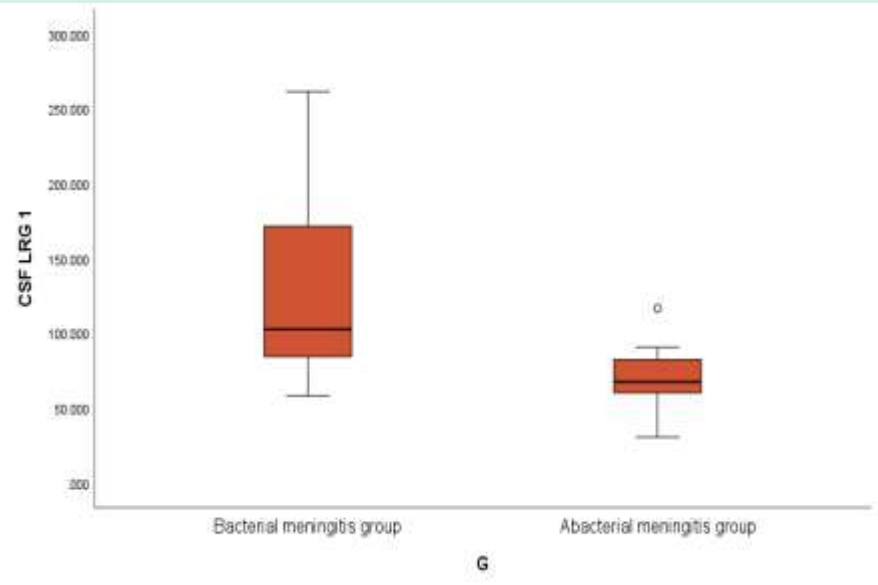
This study was conducted on 60 patients suspected to have meningitis, admitted at Alexandria Fever hospital. The patients were divided into two groups:
1.Group A: 30 patients with clinical manifestations and positive CSF criteria of suspected bacterial meningitis which include turbid/purulent CSF appearance, CSF leucocytosis with predominance of neutrophils, markedly decreased CSF glucose level and high CSF protein level.
2.Group B: 30 patients with clinical manifestations and positive CSF criteria of suspected abacterial meningitis which include normal or cloudy CSF appearance, CSF leucocytosis with predominance of lymphocytes, normal or slightly decreased CSF

glucose level and normal or slightly elevated CSF protein level. CSF was collected in sterile tubes and leucine-rich alpha-2 glycoprotein levels in CSF were assessed by enzyme linked immunosorbent assay (ELISA).

Results

CSF LRG was significantly elevated in bacterial meningitis group compared to abacterial meningitis group(p<0.001) (Table,Figure).

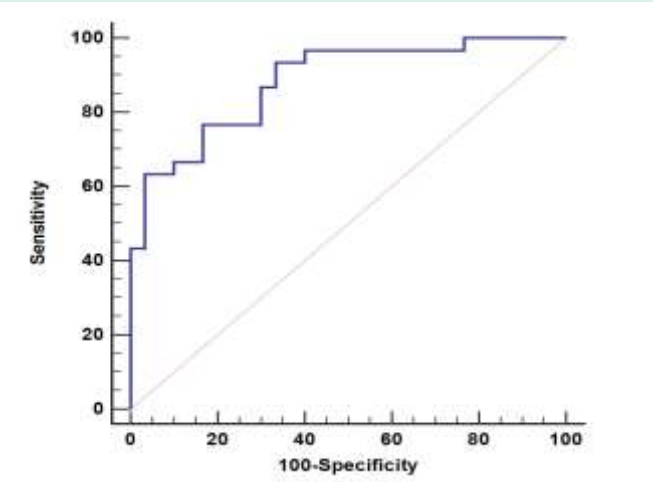
CSF LRG 1	Mean	±SD	Median	IQR		Range		Test value	P-value
Group (A) Bacterial meningitis (N= 30)	129.99	±58.79	102.615	84.28	167.51	58	261.3	5.45	<0.001 (HS)
Group (B) Abacterial meningitis (N= 30)	69 ±	17.09	67.385	60.18	81.95	30.36	116.5		



Comparison between the two studied groups regarding CSF LRG

CSF LRG can significantly predict bacterial meningitis (P <0.001 and AUC = 0.882) at cut-off >79.58 with 86.67% sensitivity, 70% specificity, 74.3% PPV and 84% NPV (Table&Figure).

Cut-off	Sensitivity	Specificity	PPV	NPV	AUC	P value
>79.58	86.67%	70%	74.3%	84%	0.882	<0.001



ROC curve of CSF LRG in differentiation between bacterial and abacterial meningitis

Conclusion

CSF LRG is a novel biomarker that can significantly predict bacterial meningitis and can differentiate between bacterial and abacterial meningitis.