Blood Procalcitonin Predicts Spontaneous Bacterial Peritonitis in Patients with Cirrhosis and Ascites

Mehrnaz Asadi Gharabaghi[1], Seyed Farshad Allameh[*2], Hossein Foroutan[3], Alireza Abdollahi[4], Mitra Kazemi Jahromi[2], Effat Kahe[2], Siamak Mehdizadeh Seraj[5]

1. Department of Respiratory Medicine, Tehran university of Medical Sciences, Tehran, Iran
2. Department of Internal Medicine, Tehran University of Medical Sciences, Tehran, Iran
3. Department of Gastroenterology, Tehran University of Medical Sciences, Tehran, Iran
4. Department of Pathology, Tehran University of Medical Sciences, Tehran, Iran
5. Students` Scientific Research Center, Tehran University of Medical Sciences, Tehran , Iran

[*] **Corresponding Author:**
Seyed Farshad Allameh, MD
Assistant professor, Department of Internal Medicine, Imam Khomeini hospital, Tehran University of Medical Sciences, Tehran, Iran
Telefax: +98 21 66939922
Email: farshad125@yahoo.com
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Spontaneous bacterial peritonitis (SBP) is defined as an ascitic fluid infection without a surgically-treatable intra-abdominal source. Timely diagnosis and treatment of SBP may increase the patient's survival.[1] Any biological marker that could strongly predict SBP may obviate the need for paracentesis while increasing the patient's chance of survival by expediting the diagnosis and treatment of SBP. Procalcitonin (PCT) is a marker of early infection. There is some evidence that PCT production increases only in bacterial infections. It is more sensitive and specific than CRP in differentiating bacterial infection from non-microbial inflammation.[2-4] There are a few reports of the clinical utility of PCT in diagnosis of SBP in patients with cirrhosis.[5-7]

The aim of the present study was to determine any correlation between blood PCT and SBP in patients with cirrhosis and ascites to propose PCT test as a possible supplant for paracentesis in SBP diagnosis.

We included 33 patients (15 men, 18 women; age range 16-68 years) with liver cirrhosis and ascites. They were suspected to have SBP based on the symptoms such as abdominal pain and clinical signs such as superficial abdominal tenderness. The diagnosis was established if there were more than 250 polymorphonuclear cells per milliliter of the ascitic fluid. The blood level of procalcitonin was compared between patients with and without SBP.

Eight patients (24.2%) with documented SBP comprised the case group and the remaining 25 patients (75.8%) with no evidence of SBP constituted the control group. Table 1 summarizes the comparison of values between the groups with and without SBP. The percentage of patients with positive blood PCT levels was higher in case group than controls (75% vs. 8%, respectively; p=0.001). There was a significant correlation between positive blood PCT levels and the presence of SBP. The sensitivity and specificity of positive blood PCT to predict the presence of SBP were found to be 75% and 92%, respectively. Patients with hepatorenal syndrome or hepatic encephalopathy had increased levels of PCT even in the absence of SBP.

Our findings showed a significant association between blood PCT and SBP diagnosis (p=0.001). A considerable proportion of cirrhotic

Table 1: comparison of values (percentages) between patients with and without SBP

Variable	SBP(N=8)	Non-SBP(n=25)	*p*-value
Positive PCT(number,%)	6(75%)	2(8%)	0.001
Smoking (number,%)	4(50%)	7(28%)	0.25
Mean age(years)	47.1±8.4	42.8±13.5	0.407
Creatinine(mg/dL)	2.02±1.07	0.99±0.46	0.03
MELD score	24.8±4.2	18.8±8.04	0.01
Hepatic encephalopathy(number,%)	5(62.5%)	3(12%)	0.006
Hepatorenal syndrome(number,%)	3(37.5%)	1(4%)	0.02
Multiorgan damage(number,%)	3(37.5%)	1(4%)	0.02

MELD: Model For End-Stage Liver Disease

patients with established SBP (75%) had serum PCT of ≥ 0.5 ng/mL. There are reports demonstrating the strength of blood PCT in rapid recognition of SBP with high sensitivity and specificity.[5-7] But, the diagnostic accuracy of this marker in prediction of SBP may decrease in patients with hepatic encephalopathy or hepatorenal syndrome.[8]

CONFLICT OF INTEREST

The authors declare no conflict of interest related to this work.

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