Diagnosis Of Spontaneous Bacterial Peritonitis Using Leukocyte Esterase Strips

Thesis

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تشخيص الالتهاب البريتونى البكتيرى التلقائى باستخدام شرائط الليكوسيت استيراز

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SUMMARY

Liver cirrhosis and ascites are common problems among Egyptians. The cause of chronic liver disease is mutli factorial including schistosomiasis and-or viral hepatitis.

Spontaneous ascitic infection is an infection in a previously sterile ascitic fluid with no apparent intra abdominal source of infection.

In our study one seventy five patients with liver cirrhosis complicated by ascites were studied for the use of leukocyte esterase reagent strips for the rapid diagnosis of SBP and comparison was done between to different types of leukocyte esterase reagent strips.

Full history, thorough clinical examination and routine laboratory investigations including blood picture, liver and kidney function tests together with chemical, bacteriological, cytological and dipstick testing of ascitic fluid were carried out. Also abdominal ultrasonography was done.

Spontaneous ascitic fluid infection was found in 50 patients (group I) while 25 (group II) were free of ascitic fluid infection. Abdominal pain and hepatic

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List of Abbreviations

Abbrev.	Meaning
ACE	Angiotensin Converting Enzyme
AF	Ascitic Fluid
ALK	Alkaline Phosphatase
ALT	Alanine Transaminase
AKI	Acute kidney Injury
AST	Aspertate Transaminase
ATN	Acute Tubular Necrosis
BT	Bacterial Translocation
CBC	Complete Blood Count
CGRP	Calcitonin Gene-Related Peptide
CNNA	Culture Negative Neutrocytic Ascites
ET-1	Endothelin-1
ESBL	Extended-Spectrum Beta-Lactam
GALT	Gut-Associated Lymphoid Tissue
GFR	Glomerular Filtration Rate
GI	Gastro-intestinal
Hb	Hemoglobin
HE	Hepatic Encephalopathy
HRS	Hepato-Renal Syndrome
INR	International Normalized Ratio
LDH	Lactate Dehydrogenase

LVP	Large Volume Paracentesis
MARS	Molecular Adsorbent Recirculating System
MELD	Model for End-stage Liver Disease
MLN	Mesenteric Lymph Nodes
MRSA	Methicillin-Resistant S. Aureus
NO	Nitric Oxide
NSAIDs	Non Steroidal Anti-Inflammatory Drugs
PAMP	Pathogen-Associated Molecular Pattern
PBC	Primary Biliary Cirrhosis
PCD	Post-paracentesis Circulatory Dysfunction
PMNL	Polymorphonuclear Leukocyte
PRR	Pattern Recognition Receptor
PSC	Primary Sclerosing Cholangitis
PT	Prothrombin Time
PVS	Peritoneo-Venous Shunting
RAAS	Renin Angiotensin Aldosterone System
RBF	Renal Blood Flow
RCT	Randomized Controlled Trial
SAAG	Serum Ascetic Albumin Gradient
SBP	Spontaneous Bacterial Peritonitis
SNS	Sympathetic Nervous System
TIPS	Transjugular Intrahepatic Portosystemic Shunt
TLR	Toll Like Receptor

INTRODUCTION

Spontaneous bacterial peritonitis (SBP) is an acute bacterial infection of ascitic fluid in the absence of any obvious intraabdominal infectious foci ***(Ozmen et al., 2006).*** Spontaneous bacterial peritonitis is one of the potentially life-threatening complications in ascitic cirrhotic patients with a mortality rate ranging between 30 and 50%. The improved survival might be explained by a more rapid diagnosis and treatment ***(Thévenot, et al., 2004).*** Of patients with cirrhosis who have Spontaneous bacterial peritonitis, 70% are Child-Pugh class C. In these patients, the development of Spontaneous bacterial peritonitis is associated with a poor long-term prognosis ***(Bandy and Alan, 2006).***

Enteric organisms are isolated from more than 90% of infected ascitic fluid (AF) in Spontaneous bacterial peritonitis, suggesting that the gastrointestinal tract is the source of bacterial contamination ***(Bandy and Alan, 2006).*** The main route by which the ascitic fluid becomes infected is the heamatogenous route. The pathogenic mechanism by which infection develops is bacterial translocation from the intestinal flora to the mesenteric lymph nodes and from there to the bloodstream. Contributing factors are an

increased growth of Gram-negative aerobic bacilli in the jejunum, changes in the intestinal barrier and in addition factors which could reduce the local flow of blood.

For clinical diagnosis, patients with Spontaneous bacterial peritonitis may present with signs of peritoneal irritation and pain, together with changes in gastrointestinal motility, sometimes with nausea, vomiting, diarrhea or ileus. Many patients however, may not show any symptoms or signs of Spontaneous bacterial peritonitis. Diagnostic paracentesis of the ascitic fluid must be performed for every patient with cirrhosis, hospitalized with ascites. Laboratory diagnosis of Spontaneous bacterial peritonitis is carried out by estimation of polymorphonuclear count in the ascitic fluid, together with a positive culture from the ascitic fluid, which is characteristically monomicrobial ***(Strauss and Caly, 2006).***

The diagnosis is based on testing of the ascitic fluid obtained by paracentesis. A polymorphonuclear cell count more than 250 cells/mm3 of ascetic fluid is considered diagnostic and warrants immediate antibiotic treatment ***(Runyon, 2006).***

A more rapid diagnosis of Spontaneous bacterial peritonitis can be obtained via the use of leukocyte esterase,

which is present in biological fluids and reacts with a component of the dipstick, changing its color. Leucocytes esterase reagent strips in urine -being a sensitive ultra rapid test for detecting leucocytes in urine and hence infection- will be tried on ascitic fluids of patients suspected to have Spontaneous bacterial peritonitis to prove efficacy in comparison to laboratory technique ***(Braga et al., 2006).***

AIM OF THE WORK

1. The aim of this study is to assess the usefulness of the urine strips with leucocytes esterase reagent to diagnose SBP, using two different brands of strips, the Multistix test and the Makromed test strips.

2. To compare the obtained results to the conventional laboratory methods (ascetic fluid cell count and culture) used to diagnose Spontaneous bacterial peritonitis.

3. To find easy, reliable, rapid, and cheap bedside test to diagnose Spontaneous bacterial peritonitis