A study of risk factors of Spontaneous Bacterial Peritonitis

Thesis

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By

Mohamed Mohamed El Mekkawey

(M.B.B.Ch.)

Supervisors

Dr. Magdy Amin El-Serafy

Professor of Tropical Medicine

Faculty of Medicine

Cairo University

Dr. Maha Said Hasaballah

Assistant professor of Tropical Medicine

Faculty of Medicine

Cairo University

Dr.Hanan Abdel Hafez Hamed

Lecturer of Tropical Medicine

Faculty of Medicine

Cairo University

Faculty of Medicine

Cairo University

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ABSTRACT

Full history, through clinical examination and routine laboratory investigations including blood pictures, ESR, liver & kidney function tests together with chemical, bacteriological and cytological testing of the ascitic fluid were carried out. Also abdominal ultrasonography and upper GIT endoscopy were done.

KEY WORD: risk factors Peritonitis Spontaneous

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LIST OF ABBREVIATION

AASLD	American association for the study of liver disease .
ALT	Alanin aminotransferase
AST	Aspartate aminotransferase.
C_1	Complement 1
C3	Complement 3.
C5a	Complement 5a.
CNNA	Culture negative neutrocytic ascites.
CSF	Cerebrospinal fluid
DNA	Deoxyribonucleic acid.
E-coli	Escherichia coli.
FN	Fibronectin.
GE	Granulocyte elastase.
HRS	Hepatorenal syndrome.
Ig	Immunoglobulin.
IL	Interleukin
LDH	Lactate dehydrogenase.
LPS	Lipopolysaccharide.
MNNB	Monomicrobial non neutrocytic bacterascites.
NO	Nitric oxide.
PMN	Polymorphonuclear leukocyte.
SAAG	Serum ascitic albumin gradient .
SBP	Spontaneous bacterial peritonitis.

SID	Selective intestinal decontamination.
TLC	Total leukocyte count.
TIPS	Trans jugular intrahepatic portosystemic shunt.
TNF	Tumor necrosis factor.
VEGF	Vascular endothelial growth factor.

INTRODUCTION

Spontaneous bacterial peritonitis (SBP) is an increasingly recognized complication of cirrhosis with ascites. However, the presence of ascites from any cause appears to be a risk factor for this infection. The etiology of SBP is multifactorial, including derangements in the reticuloendothelial system, abnormalities of both the serum and ascitic fluid humoral immune systems, and systemic bacteremia **(Wilcox and Dismukes, 1987).**

Bacterial translocation is a key step in the pathogenesis of spontaneous bacteraemia and SBP in cirrhosis. Translocation of intestinal bacterial products from viable or non-viable bacteria, such as endotoxin and bacterial DNA, has recently been associated with pathophysiological events, such as activation of the immune system and derangement of the hyperdynamic circulatory status in cirrhosis **(Guarner and Soriano, 2005).**

The increased serum and ascitic fluid nitric oxide found in patients with infected ascites might induce deterioration of the increased peripheral vasodilation found in this setting, leading to the development of renal impairment in patients with spontaneous bacterial peritonitis **(Such et al., 2004).**

In a recent study, all spontaneous ascites infection episodes were symptomatic. In all of the episodes, most common clinical features were as follows: abdominal tenderness (54.5%), icterus (54.5%), hepatic encephalopathy (50.7%), fatigue (46.7%), abdominal pain (44.4%) and fever (38.8%). The mortality rate is approximately 30-50% **(Filik et al., 2004).**

A diagnostic paracentesis should be performed in any cirrhotic patient who suddenly deteriorates or presents with any compatible symptom of SBP, most frequently fever or abdominal pain, or both**(Garcia, 1992).**

A polymorphonuclear leukocyte (PMN) count greater than 250/mm^3 is indicative of SBP, and treatment with intravenous broad-spectrum antibiotics should be initiated immediately**(Conn et al., 2000) .**

Although the mortality of an acute episode of SBP decreases with early therapy, it is still high(15-50%), and patients who survive an episode of SBP have a high frequency of recurrence. Mortality seems to be related to the severity of the underlying liver disease, because only a third of patients die from sepsis and prophylactic antibiotics decrease the frequency of SBP but do not seem to improve long-term survival**(Conn et al., 2000) .**

When spontaneous bacterial peritonitis is suspected, prompt diagnostic paracentesis followed by broad-spectrum antibiotics and albumin infusion can be life saving **(Saadeh and Davis, 2004).**

The treatment regimen for SBP and/or bacteremia is empiric antibiotic therapy initiated immediately after the diagnosis of infection was made (day 0). The antibiotics used are a third-generation cephalosporin (ceftriaxone) or the combination of amoxicillin-clavulanic acid with a fluoroquinolone (ofloxacin). Antibiotic therapy is then adapted to the individual patient, on the basis of the results of the antibiogram for the isolate(s) from that patient **(campillo et al.,2002).**

Paracentesis is performed 2-3 days and 7-10 days after initiation of antibiotic therapy to determine leucocyte and PMN counts in ascitic fluid **(Campillo et al., 2002).**

In a study done by (**Liovet et al., 1993),** the following factors were to be of bad prognosis: the presence of upper gastrointestinal bleeding at admission, the absence of abdominal pain as presenting symptom, the polymorphnuclear count (%) in the ascites, prothrombin concentration, and serum Na, creatinine, and cholesterol.

Aim of the work

The aim of the present study is to assess the risk factors in cirrhotic patients suffering from spontaneous bacterial peritonitis .

REVIEW

OF

LITERATURE

Ascites

Anatomy of the peritoneum

The peritoneum , the largest and most complexly arranged of the serous membranes, is an empty and intricately folded sac, lining the abdomen and reflected over the viscera. Where it lines the abdominal wall it is named the parietal peritoneum and reflected over the viscera as the visceral peritoneum **(Williams et al., 1989).**

The parietal and visceral peritoneal layers are in contract, the potential space between them being the peritoneal cavity. It consists of : (1) a main region, the greater sac and (2) a diverticulum, the omental bursa or lesser sac behind the stomach and adjoining structures; the two communicate via the epiploic foramen **(Williams et al., 1989)**. The parietal peritoneum is thicker than the visceral peritoneum and contains a richer capillary network that ramifies extensively within the peritoneal lining. This vascular supply allows the parietal peritoneum to be dissected free from deeper structures without altering its viability **(Solomkin et al., 1999)**. In males, the peritoneum forms a closed sac, while in females; it is continuous with the mucous membranes of the fallopian tubes **(Hiyama and Bennion, 1997).**

The peritoneum is single layer of mesothelial cells, with a basement membrane supported by an underlying layer of highly vascularized connective tissue. These cells contain microvilli 1.5 to 3 um in length, which greatly increase their surface area **(Solomkin et al., 1999).**

Indeed, the surface area of the peritoneum is extensive, averaging $1.8m^2$ in the adult male , and is comparable to the surface area of the skin. One half of the peritoneum, about $1m^2$, functions as a passive, semi permeable membrane to the diffusion of water, electrolytes and macromolecules **(Hiyama and Bennion, 1997).** Under normal condition, the peritoneal cavity is largely a potential space, as only a thin film of fluid

separates the parietal and visceral layers. This fluid serves as lubricant, allowing the abdominal viscera to slide freely within the peritoneal cavity **(Solomkin et al., 1999).**

Ascites

The word ascites of Greek origin (askos) and means bag or sac **(Reynolds, 2000).** Ascites is a detectable collection of free fluid in the peritoneal cavity **(Wong and Blendis, 2003)**

Eighty percent of cases of ascites are caused by hepatic diseases, in the remaining 20%, cancer, inflammation, pancreatic or cardiac disease can be found **(Hwangbo et al., 2007)**

Etiology :

The cause of ascites may be classified pathophysiologically into ascites with normal peritoneum and ascites with diseased peritoneum **(Hwangbo et al., 2007)**

A) Causes of Ascites with Normal Peritoneum:

1**) Portal hypertension:**

- Cirrhosis.
- Hepatic fibrosis
- Congestive heart failure.
- Budd-Chiari syndrome.
- Constrictive pericarditis.

2) **Hypoalbuminemia:**

- Nephritic syndrome.
- Protein energy malnutrition
- Protein losing enteropathy.

3**) Miscellaneous conditions**:

- Chylous ascites.
- Pancreatic ascites.
- Bile ascites.
- Nephrogenic ascites.
- Myxoedema.

- Urine ascites.

B) Causes of Ascites with diseased peritoneum:

1) Infection:

- Bacterial peritonitis (other than T.B) **.**
- Tuberculous peritonitis.
- Fungal peritonitis.
- Parasitic diseases.

2) Malignancy

3) Other causes:

- Familial Mediterranean Fever.
- Vasculitis.
- Granulomatous peritonitis.

A) Causes of Ascites with Normal Peritoneum:

1) Portal hypertension:

- Cirrhosis :

It is by far the most common cause of ascites as it constitutes 80% of the causes of ascites. In cirrhosis, ascites develops in the presence of portal hypertension, peripheral vasodilatation and renal sodium retention, the three major theories of the pathogenesis of ascites in cirrhosis differ mainly in the sequence of events leading to sodium retention and fluid accumulation **(Runyon, 2004) .**

- Hepatic fibrosis:

In Schistosomiasis, the ova penetrate and obstruct the portal branches and are deposited either in the large radicles producing the coarse type of bilharzial hepatic fibrosis or in the small portal tracts producing the fine diffuse from. Wide, irregular and thin walled vascular spaces are found in 85% of cases and form a characteristic features in the thickened portal tract **(Sherlock and Dooley, 2002)**

- Congestive heart failure:

Ascites is a known manifestation of congestive heart failure and reflects long standing venous congestion **(Runyon, 1998).**

- Constrictive pericarditis:

Ascites represents a chief finding in constrictive pericarditis. Constrictive pericarditis is one of the few curable causes of ascites but it tends to recur **(Runyon, 1998).**

- Budd-Chiari syndrome (Hepatic vein obstruction):

This syndrome includes hepatomegaly, ascites and abdominal pain, also jaundice and splenomegaly may be found **(Janssen, 2003).**

- Portal vein thrombosis :

It may occur due to many factors as trauma, malignancy, cirrhosis, infection and other miscellaneous causes**(Sherlock and Dooley, 2002).**

2) Hypoalbuminemia:

- Protein energy malnutrition:

Protein energy malnutrition is caused either by decreased intake of energy and protein, increased nutrient loss or increased nutrient requirement detected by the underlying illness (fever, surgery, neoplasia and burns) **(Baron, 1996).**

- Protein loosing enteropathy:

Protein may be lost through one of three mechanisms either mucosal disease with ulceration e.g. chronic gastric ulcer, gastric carcinoma, inflammatory bowel disease and lymphoma or lymphatic obstruction e.g. primary intestinal lymphangiectasia, infections (T.B), Whipple's disease and neoplasm as lymphoma or idiopathic change in permeability of mucosal capillaries and conductance of interstitium e.g. Zollinger Ellison syndrome, acute viral gastroenteritis and systemic lupus erythromatosis **(Kenneth and Macquaid, 1996).**