Spontaneous Bacterial Peritonitis (SBP) - Full Clinical Guideline

Reference no.: CG-T/2023/220

1. Introduction

Spontaneous Bacterial Peritonitis (SBP) is a frequent and serious complication that can occur in patients with ascites. Patients with SBP are frequently asymptomatic, and it occurs in up to 15% of all those with ascites admitted to hospital irrespective of their symptoms.

The probability of survival at 1 year following an episode of SBP is 30-50%. SBP should trigger referral for transplant assessment where appropriate.

The prevalence of SBP in cirrhotic patients with ascites is 1.5-3.5% in outpatients and 10% in inpatients.

Note that patients may be asymptomatic or SBP may manifest as hepatic encephalopathy or worsening of liver function as opposed to abdominal pain or fever

2. Diagnosis

The diagnosis should be suspected in all cirrhotic patients with ascites presenting to hospital. A diagnostic ascitic tap should be performed in all such patients within 12hrs of admission. See cirrhosis care bundle. Delayed diagnostic paracentesis (> 12h post admission) associated with a 2.7-fold increase in mortality.

3. Investigations

To improve bacterial diagnosis, the diagnostic ascitic tap and blood culture should ideally be performed **prior to starting antibiotics** and sent for culture. However, in patients meeting **high-risk-sepsis criteria**, appropriate antibiotics are required within one hour and should not be delayed if the samples cannot be obtained immediately. If septic, then please refer to **sepsis guidelines**.

SBP is confirmed by either an ascitic neutrophil (polymorph) count of ≥ 250 cells / mm^3 OR ascitic fluid WCC of ≥ 500 cells/ mm^3

The use of reagent strips is **not** recommended for diagnosis in cases of **suspected** SBP. Ascites culture is negative in as many as 60% of patients with SBP.

Bacterascites refers to the positive culture of ascitic bacteria in association with an ascitic **neutrophil count < 250 cells/ mm^3**. This can be seen as a result of extraperitoneal infection or herald SBP. **Do not start antibiotics if clinically well**, but instead repeat ascitic WCC. 62% of cases will resolve without antibiotics.

A very high ascitic neutrophil count (1000s), the presence of multiple organisms (particularly fungi and enterococcus) on culture or localised abdominal symptoms/ signs raises the possibility of secondary bacterial peritonitis due to perforation or inflammation or intraabdominal organs. A CT scan of the abdomen/ pelvis should be considered under these circumstances.

4. Treatment:

Antibiotic Management:

The most common pathogens causing SBP are gram negative bacteria such as *Escherichia coli* and *Klebsiella*. However, streptococcal and staphylococcal infections can also occur. Patients receiving prophylaxis with a fluoroquinolone antibiotic may have SBP caused by gram positive cocci.

Initial Treatment in SBP:

Table 1: Treatment of SBP

Initiate **antibiotic therapy** if neutrophil count ≥ 250 cells/ mm^3

First line	Piperacillin tazobactam IV 4.5g 8 hourly
Second line, if non-immediate without systemic involvement penicillin allergy	Cefuroxime IV 1.5g 8 hourly +/- Metronidazole IV 500mg 8 hourly
Third line, if immediate rapidly evolving or non-immediate with systemic involvement penicillin allergy	Ciprofloxacin***** 400mg IV 12 hourly +/- Metronidazole IV 500mg 8 hourly
Switch to oral as per table 2 when clinically appropriate using IV to OS criteria. Total duration (including IV and oral step down): 7 days *see MHRA quinolones alert on page 4	

A repeat ascitic sample should be taken 48hrs after initiation of antibiotics. A **< 25% reduction in neutrophil count** should raise suspicion of antibiotic resistance and treatment should be modified according to culture results or discussion with a Microbiologist.

Albumin:

Renal impairment occurs in approximately 30% of patients with SBP treated with antibiotics alone. 20% human albumin solution should be administered on day 1 (1.5g/kg) (within 12hrs of diagnosis) and 3 (1g/kg).

Oral Continuation Treatment following initial SBP Treatment Above:

(NB: see national IV to PO switch criteria and decision aid)

Table 2: Oral continuation treatment

First line	Co-trimoxazole PO 960mg BD (Reduce dose to 480mg BD if CrCl <30mL/min – N.B. contains a sulphonamide and trimethoprim)
Second line - Allergic to sulphonamide and/or trimethoprim	Ciprofloxacin***** PO 500mg BD
Total duration for SBP (including IV and oral step down): 7 days *see MHRA quinolones alert on page 4	

Antibiotics in Primary Prophylaxis:

The role for antibiotics in primary prophylaxis is not proven.

Continuous Secondary Prophylaxis:

Secondary prophylaxis (as below) should be given to all patients who have recovered from one previous episode of SBP (recurrence rate 70% at 1 year):

- *If the patient has a history of resistant infection,* please discuss with microbiology before starting prophylaxis.
- *If the patient has a history of C. difficile infection or carriage,* please discuss with microbiology before starting prophylaxis with quinolone antibiotics. The patient should be made aware of the relatively high risk of *C. difficile* relapse with fluoroquinolone antibiotics.
- *All patients receiving antibiotic treatment should be warned to report symptoms that may be consistent with C. difficile infection to their consultant, GP or specialist nurse.*

First line	Co-trimoxazole PO 960mg OD (N.B. contains sulphonamide and trimethoprim)
Second line - Allergic to sulphonamide and/or trimethoprim	Ciprofloxacin***** PO 500mg OD *see MHRA quinolones alert on page 4

MHRA fluroquinolone Alert

Fluoroquinolones (e.g. levofloxacin, ciprofloxacin) can very rarely cause long-lasting (up to months or years), disabling, and potentially irreversible side effects, sometimes affecting multiple systems, organ classes, and senses.

- Ciprofloxacin and levofloxacin should be avoided in:
  - Patients at risk of QTc prolongation. Contact Microbiology for further advice.
  - Patients with **previous history of MRSA**, contact Microbiology for further advice.
  - Patients with **myasthenia gravis** (risk of exacerbation), contact Microbiology for further advice.
- **Prescribe with special caution in:**
  - **People at higher risk of tendon injury** e.g.:
    - Patients older than 60 years
    - Patients with renal impairment or solid-organ transplants o
  - **Patients with epilepsy**, contact Microbiology for further advice.
- **Avoid use of a corticosteroid with a fluoroquinolone** since co-administration could exacerbate fluoroquinolone-induced tendonitis and tendon rupture (see MHRA alert for more details).
- Fluoroquinolones are associated with a small risk of heart valve regurgitation and aortic aneurysm and dissection (see MHRA alert for more details).
- Fluroquinolones are associated with a small risk of increased psychiatric reactions, including depression and psychotic reactions (see MHRA alert for more details)

Treatment should be discontinued at the first signs of a serious adverse reaction, including tendon pain or inflammation

5. Further reading

a. EASL clinical practice guidelines on management of ascites, spontaneous bacterial peritonitis and hepatorenal syndrome. Journal of Hepatology 2010; 53: 397-417
b. BSG guidelines on the management of ascites in cirrhosis. GUT 2006; 55 (Suppl 6) 1-12

6. References

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18. Documentation Controls

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Development of Guideline: Dr Fadwa Elsanousi (Microbiology Consultant), Dr Adam Lawson (Hepatology Consultant), Kayleigh Lehal (Lead Antimicrobial Pharmacist), Amandeep Soggi (Specialist Antimicrobial Pharmacist),				
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