

# Antibiotic use in primary and secondary prophylaxis of Spontaneous Bacterial Peritonitis for liver cirrhosis patients

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## Introduction

Spontaneous Bacterial Peritonitis (SBP) is the most common infection in end-stage liver disease patients<sup>1</sup>. It is defined as an ascitic fluid infection with a polymorphonuclear leucocyte (PMN) count  $\geq 250/\text{mm}^3$ . SBP has a poor overall prognosis with 30-50% mortality within 1 year and a 70% chance of re-occurring<sup>1</sup>.

Bacterascites is defined as culture positive ascites with a PMN count less than  $250/\text{mm}^3$ ; the most common organism is Escherichia coli.

Evidence suggests that antibiotic prophylaxis for patients with previous SBP (secondary prophylaxis) and patients with low total protein count ascites (primary prophylaxis) improves survival and prevents recurrence<sup>2,3</sup>.

## EASL guidelines

"The use of prophylactic antibiotics must be strictly restricted to patients at high risk of SBP. Three high-risk patient populations have been identified:

- (1) patients with acute gastrointestinal haemorrhage (primary prophylaxis)
- (2) patients with low total protein content in ascitic fluid and no prior history of SBP (primary prophylaxis)
- (3) patients with a previous history of SBP (secondary prophylaxis)."

## Aims

Audit adherence of Oxford gastroenterology department to EASL guidelines regarding antibiotic prophylaxis of SBP

1. Were patients with confirmed SBP (or bacterascites (BA)) commenced on secondary prophylaxis antibiotics?
2. Were patients with low ascitic total protein (<15g/l) commenced on primary prophylaxis antibiotics?

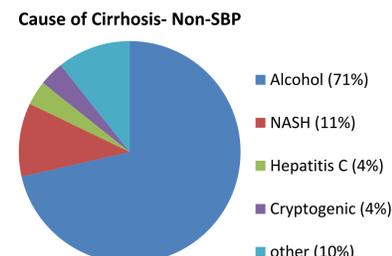
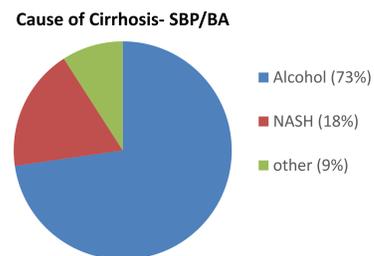
## Methods

- 1) All ascitic taps performed in the John Radcliffe Hospital between 15/10/16-15/10/17 period were collected
  - a) Patients without liver cirrhosis were removed
- 2) Patients with SBP were investigated whether prophylactic antibiotics were commenced
  - a) Their ascitic fluid was examined for protein count and culture
  - b) Previous taps were assessed for a low ascitic protein count
- 3) As for step 2 looking instead at patients with bacterascites
- 4) Cirrhotic patients without SBP or BA had their total ascitic protein counted. If less than 15g/L we assessed whether primary prophylactic antibiotics were started

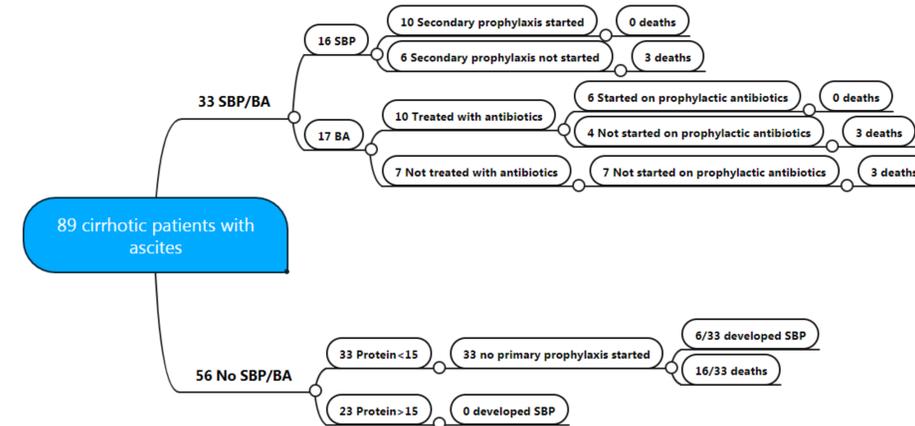
## Patient Demographics

	SBP (n=16) or BA (n=17)	No SBP or BA (n=56)
Age, years	57 (43-88)	60 (36-85)
M:F	18:15	39:17
Child Pugh Score		
B8	2	4
B9	4	12
C	27	39
Serum Protein	21 (13-31)	25 (14-36)
Ascitic protein	6 (4-14)	7 (4-24)
SAAG	NA	NA

Data are mean (range). SAAG- serum albumin ascites gradient. SBP (spontaneous bacterial peritonitis) BA (Bacterial Ascites)



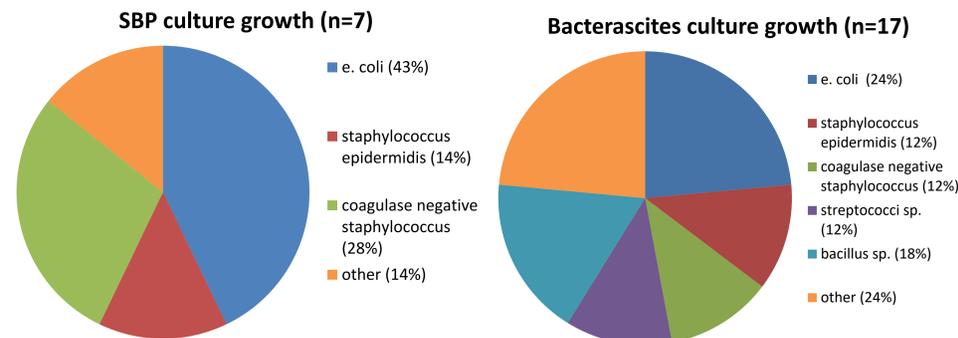
## Summary of Results



Summary of cirrhotic patients with low protein ascites, spontaneous bacterial peritonitis (SBP) and bacterascites (BA) and whether prophylactic antibiotics were given.

- Data collection period yielded 860 ascitic taps
- Of the 89 patients with liver cirrhosis, infection was identified in 33 patients; 16 patients with SBP and 17 patients with BA.

## Results 1- Organisms in SBP and BA culture



- Gram negative organisms were identified in 4/7 (43%) with SBP and 7/17 (24%) with bacterascites

## Results 2- 62.5% patients with confirmed SBP commenced secondary prophylaxis

Patients with SBP (n=16)	
Patients started on prophylactic antibiotics	10 (62.5%)
Mortality in group NOT started on prophylactic antibiotics	3 (50%)
Previous SBP	8 (50%)
Previous ascitic protein count <15g/l	16 (100%)
Primary prophylaxis given if protein count <15g/l	0 (0%)

- Secondary prophylaxis was started in 10 of 16 (62.5%) patients with SBP
- Of the patients where secondary prophylaxis was not started 3 of 6 (50%) died within 12 months
- All 16 patients had a previous tap within 12 months (mean 3.4 months) with ascitic protein count less than 15g/L. Primary prophylaxis was not started for any patients.

## Results 3- All cases of bacterascites had previously met criteria for primary prophylaxis

Patients with bacterascites (n=17)	
Patients actively treated with IV antibiotics	10 (58%)
Patients treated and started on prophylactic antibiotics	6 (60%)
12 month mortality all patients BA	6 (35%)
Previous ascitic protein count <15g/l	17 (100%)
Primary prophylaxis given if protein count <15g/l	0 (0%)

- 10 of 17 (58%) BA patients received intravenous antibiotic treatment. From this group 6 of 10 (60%) received secondary prophylaxis.
- 6 of 17 (35%) patients died within 12 months and none of these patient commenced secondary prophylaxis.
- All 17 patients had a previous tap within 12 months (mean 4.2 month) with ascitic protein count less than 15g/L

## Results 4- Patients with low ascitic protein are not started on prophylactic antibiotics

Non-SBP or BA patients (n=56)	
Ascitic Protein count <15g/l	33 (59%)
Started on prophylactic antibiotics	0 (0%)
Mortality within 12 months	16 (48%)

- Of the 56 patients without SBP or BA 33 (58.9%) had an ascitic protein count of less than 15g/L. No patients were started on primary prophylactic antibiotics.
- 6 of 33 (18.1%) patients with low protein ascites subsequently developed SBP when reviewed prospectively.
- No patients with ascitic protein count greater than 15g/L have developed SBP or BA. 16 of 33 (48.4%) patients with low protein ascites died over the next 12 months.

## Discussion

- 66 of 89 (74%) patients had low protein ascites and 50% (33 of 66) subsequently developed either SBP or BA within 12 months. This highlights the importance of primary prophylactic antibiotics for patients with low protein ascites in the prevention of SBP and BA.
- The most common causative organism of SBP were gram negative bacteria; EASL guidelines recommend third generation cephalosporins for treatment and quinolones such as ciprofloxacin for prophylaxis.
- Prolonged antibiotic prophylaxis (either primary or secondary) has led to the emergence of gram negative bacteria resistance to quinolones; this underlines the need to restrict the use of prophylactic antibiotics to patients with the greatest risk of SBP.

## References

1. Evans LT et al. Spontaneous bacterial peritonitis in asymptomatic outpatients with cirrhotic ascites. *Hepatology*. 2003 Apr;37(4):897-901.
2. Ginés P et al. Norfloxacin prevents spontaneous bacterial peritonitis recurrence in cirrhosis: results of a double-blind, placebo-controlled trial. *Hepatology*. 1990 Oct;12(4 Pt 1):716-24.
3. Terg R et al. Ciprofloxacin in primary prophylaxis of spontaneous bacterial peritonitis: a randomized, placebo-controlled study. *J Hepatol*. 2008 May;48(5):774-9. doi: 10.1016/j.jhep.2008.01.024. *Epub* 2008 Feb 14.

Presenter Declarations

This presenter has the following declarations of relationship with industry: NONE