

## Albumin Administration for Spontaneous Bacterial Peritonitis in the Emergency

### Department

UAMS EM JC summary - March 2018

Drs. Holleyman and Bland

Faculty advisor – Dr. Wes Watkins

### **Clinical Bottom Line**

Administration of Albumin, within the first 6 hours of presentation, to patients with cirrhosis and confirmed presence of Spontaneous Bacterial Peritonitis will prevent the incidence of Acute Renal Failure and Death.

### **PICO**

P: Adult ED patients with cirrhosis and SBP

I: administration of antibiotics + albumin

C: administration of antibiotics alone

O: prevention of renal dysfunction and death

### **Background**

Spontaneous Bacterial Peritonitis is one of the most common bacterial infections in cirrhotic patients and mortality can reach as high as 30%. Concurrently, renal failure develops in 30-40% of patients with SBP and renal dysfunction in SBP is the most powerful predictor of mortality. Mortality is present in 67% of patients with both SBP and renal failure but in only 11% who have SBP without renal failure.

The American Association for the Study of Liver Disease currently recommends albumin infusion to patients with SBP, for prevention of type 1 hepato-renal syndrome.

Reviewing these articles serves to establish the benefit of ED administration of albumin.

### **Trial 1**

Sort P, Navasa M, Arroyo V, et al. Effect of intravenous albumin on renal impairment and mortality in patients with cirrhosis and spontaneous bacterial peritonitis. *N Engl J Med.* 1999;**341**:403-409.

PubMed link: <https://www.nejm.org/doi/full/10.1056/NEJM199908053410603>

**Validity Rating:** low to moderate risk of bias

### **The Basics**

Prospective RCT of 126 cirrhotics with diagnosed spontaneous bacterial peritonitis who were given either cefotaxime alone or cefotaxime + IV albumin

### **Exclusion Criteria**

- Peritonitis (non-SBP)
- Antibiotics within 1 week
- Other infections
- Shock

- GI bleed
- Grade 3 or 4 hepatic encephalopathy
- Cardiac failure
- Organic nephropathy
- HIV any disease affecting short-term prognosis
- Cr >3.0
- Dehydration

#### **Primary Outcomes**

- Renal impairment
- Mortality – both in and out of hospital at 90 days

#### **Secondary Outcomes**

- Resolution of infection
- Duration of antibiotic use
- Paracentesis for ascites after resolution of infection
- Hospital stay in # of days

#### **Follow Up**

7 patients were lost to follow up, 4 in abx alone, 3 in abx+albumin

#### **Results**

Study was essentially limited to very stable cirrhotics with SBP who would be floor admits. They found no adverse effects from transfusion of albumin. Renal impairment was 23% lower in the group with antibiotics plus albumin. Mortality was 19% lower in intervention group vs standard group for both inpatient and at 90 days. Overall, there is limited downside (apart from cost) to albumin infusion with potential to impact mortality.

#### **Limitations/Biases**

- Use of baseline bilirubin as a predictive marker of mortality
- very specific inclusion criteria

#### **Trial 2**

Salerno F, Navickis RJ, Wilkes MM. Albumin infusion improves outcomes of patients with spontaneous bacterial peritonitis: a meta-analysis of randomized trials. *Clin Gastroenterol Hepatol.* 2013;**11**:123,30.e1.

PubMed Link: <https://www.ncbi.nlm.nih.gov/pubmed/23178229>

**Validity Rating:** low risk of bias

#### **The Basics**

Meta-analysis of 4 RCTs evaluating albumin treatment in patients with SBP, 288 total patients included. Above trial by Sort et al. included; Xue et al. consisted of 112 pts who received ceftriaxone with or without albumin within 6 hours of presentation; Fernandez et al. included 20 pts who received ceftriaxone with either albumin or 6% Hhydroxyethyl starch at time of diagnosis; Chen et al. included 30 pts who received cephalosporins with or without albumin.

**Exclusion Criteria**

- Those listed in above study, plus:
- Age <18
- "Advanced age"
- Septic shock
- Pulmonary disease
- Beta blocker treatment
- Therapeutic paracentesis within the preceding week
- Advanced HCC
- Ileus

**Primary Outcomes**

- Renal impairment
- Mortality

**Results**

- This meta-analysis showed that albumin infusion in patients with SBP decreased renal impairment and mortality
- The pooled ORs were (0.11-0.42) for renal impairment and (0.19-0.60) for mortality
- The addition of 3 RCTs to the data from the Sort et al. trial led to a 37% shrinkage of the CI for renal impairment and 41% shrinkage for mortality

**Limitations/Biases**

- Only 1 of 4 trials was blinded
- Numerous exclusion criteria may limit this specific study's application to a general ED population
- Subgroup analysis was not statistically significant enough to risk stratify different SBP pts