# Early (30-Day) Readmissions of Spontaneous Bacterial Peritonitis in the United States: A National Challenge

Dushyant Singh Dahiya[1], Madhusudhan Sanaka[2], Amandeep Singh[2], Asim Kichloo[1,3], Jennifer Wachala[3], Abhilash Perisetti[4], Hemant Goyal[5], Rajat Garg[2], Sailaja Pisipati[6], Manik Aggarwal[7], Haseeb Mohideen[8], Hafeez Shaka[9], Sumant Inamdar[10] & Mohammad Al-Haddad[8]

1. Central Michigan University College of Medicine, Saginaw, MI
2. Cleveland Clinic Foundation, Cleveland, OH
3. Samaritan Medical Center, Watertown, NY
4. Parkview Cancer Institute, Fort Wayne, IN
5. University of Texas McGovern Medical School, Houston, TX
6. Mayo Clinic, Scottsdale, AZ
7. Mayo Clinic, Rochester, MN
8. Indiana University School of Medicine, Indianapolis, IN
9. John H. Stroger Hospital of Cook County, Chicago, IL
10. University of Arkansas for Medical Sciences, Little Rock, AR

## INTRODUCTION

Spontaneous Bacterial Peritonitis (SBP) is a serious acute bacterial infection of the ascitic fluid usually seen in patients with liver cirrhosis. Despite aggressive use of prophylactic antibiotics, it is often associated with poor clinical outcomes and subsequent hospital readmissions. In this study, we aimed to assess and compare 30-day (30d) readmissions of SBP with index SBP hospitalizations.

## METHODS

We utilized the National Readmission Database for 2018 to identify all adult (≥18 years) hospitalizations with a primary index diagnosis of SBP and subsequent 30d readmission. Hospitalization characteristics and outcomes for index and 30d readmissions of SBP were highlighted and compared. A multivariate regression analysis was used to determine independent predictors for 30d all-cause readmissions. P-values ≤ 0.05 were considered statistically significant.

## RESULTS

- In 2018, there were 5,797 index admissions for SBP, of which 1,726 (30%) were readmitted within 30d for all causes.
- Compared to index admissions, 30d readmissions of SBP had a lower mean age (56.1 vs 58.6 years, p<0.001). However, there was no statistically significant difference for age between the two groups.
- Large bed-sized hospitals had a higher proportion of 30d readmissions of SBP (61.9% vs 58.6%, p=0.012) compared to index admissions.

| VARIABLE | INDEX ADMISSION OF SBP | THIRTY-DAY READMISSION OF SBP | p-value |
|---|---|---|---|
| **TOTAL NUMBER OF HOSPITALIZATIONS** | 5,797 | 1,726 | |
| **MEAN AGE (YEARS) ± STANDARD ERROR** | 58.6 ± 0.6 | 56.1 ± 1.0 | <0.001 |
| **GENDER (%)** | | | 0.393 |
| Males | 59.4 | 60.7 | |
| Females | 40.6 | 39.3 | |
| **AGE GROUPS (%)** | | | 0.707 |
| Young Adults (18-34 years) | 13.8 | 17.8 | |
| Middle Age (35-64 years) | 53.3 | 55.5 | |
| Elderly (≥65 years) | 32.9 | 26.7 | |
| **HOSPITAL BED-SIZE (%)** | | | 0.012 |
| Small | 16.8 | 13.3 | |
| Medium | 24.6 | 24.8 | |
| Large | 58.6 | 61.9 | |

| OUTCOME | INDEX ADMISSION OF SBP | THIRTY-DAY READMISSION OF SBP | ODD'S RATIO (95% CI) | p-value |
|---|---|---|---|---|
| **Inpatient Mortality (%)** | 4.9 | 10.0 | 2.15 (1.66 – 2.79) | <0.001 |
| **Mean Length of Stay (days)** | 6.2 | 6.8 | 0.6# (-0.1 – 1.1) | 0.051 |
| **Mean Total Hospital Charge ($)** | 56,000 | 85,031 | 29,032# (12,867 – 45,197) | <0.001 |

#: Mean Difference, SBP: Spontaneous Bacterial Peritonitis, CI: Confidence Interval.

## RESULTS

- Thirty-day readmissions of SBP were associated with higher odds of inpatient mortality (10% vs 4.9%, OR: 2.15, 95% CI: 1.66–2.79, p<0.001) compared to index admissions.
- Thirty-day readmissions of SBP had a higher mean total hospital charge [$85,031 vs $56,000, OR: 29,032, 95% CI: 12,867–45,197, p<0.001] compared to index admissions.
- No statistical difference was noted in the mean length of stay [6.2 vs 6.8 days, OR: 0.6, 95% CI: -0.1–1.1, p=0.051] between the two groups.
- Chronic pulmonary disease (aOR: 1.33, 95% CI: 1.07–1.64, p=0.009) and discharge against medical advice (aOR: 1.78, 95% CI: 1.10–2.88, p=0.018) were identified as independent predictors for 30d readmissions of SBP.

## DISCUSSION

SBP is associated with poor survival outcomes and high mortality rates despite the use of prophylactic antibiotics. In 2018, 30d all-cause readmission rate for SBP was 30%. Inpatient mortality for 30d readmissions of SBP was more than double of that for index admissions, reflecting a greater severity of disease at readmission and worse outcomes. Patients with chronic pulmonary disease and those that leave the hospital against medical advice were more likely be readmitted within 30d of index admission.

## CONTACT

**Dushyant Singh Dahiya, MD**
**Resident, Department of Internal Medicine**
**Central Michigan University College of Medicine, Saginaw, MI**
**Email: dush.dahiya@gmail.com**
**Phone: (678) 602-1176**
**Twitter: @DushDahiya**