

INTRODUCTION

There is little guidance in regards to evaluation and management of patients with *Staphylococcus aureus* bacteriuria (SABU).

SABU is rare, accounting for only 0.5 – 6.0% of all positive urine cultures. [1-4]

SABU is associated with invasive disease and death. It is estimated that 7-30% patients with SABU have or will develop *Staphylococcus aureus* bacteremia (SAB). [3,4,5,16,20,21]

Likewise, it has been observed that 16-17% of patients with SABU develop invasive *S. aureus* infection within 12 months of SABU. [5,9]

Here we hypothesize that patients with SABU without bacteremia that do not receive treatment will go onto develop *S. aureus* invasive disease, recurrent SABU, or death within 12 months.

METHODS

- Study design (see figure 1):
 - Retrospective chart review
- Setting:
 - Nationwide Veterans Affairs between October, 2017 and December, 2019
- Inclusion criteria (see table I):
 - Patients with any growth of *S. aureus* in the urine (detectable positive urine culture).
- Exclusion criteria (see table I):
 - Receipt of urologic procedures within 4 weeks of bacteriuria episode
 - Urinary diversions (ileal conduit, neobladder, suprapubic catheter)
 - Bacteremia within 48 hours
 - Any use of urinary catheter within 4 weeks of bacteriuria episode
 - Urinary tract obstruction due to renal calculi

OUTCOMES / RESULTS

- Death within 12 months of SABU (see table II)
 - 11% died in the treatment arm within 12 months of documented SABU
 - 7% died in the no-treatment arm within 12 months of documented SABU
- Invasive *Staphylococcus aureus* infection within 12 months of SABU (see table II)
 - 3.3% of the treated patients developed invasive *S. aureus* disease within 12 months of documented SABU
 - 1.8% of the patients that did not receive treatment went onto develop invasive *S. aureus* disease
- Recurrent SABU within 12 months (see table II)
 - 15.6% of patients who received treatment went onto develop recurrent SABU
 - 17.5% of patients who did not receive treatment went onto develop SABU

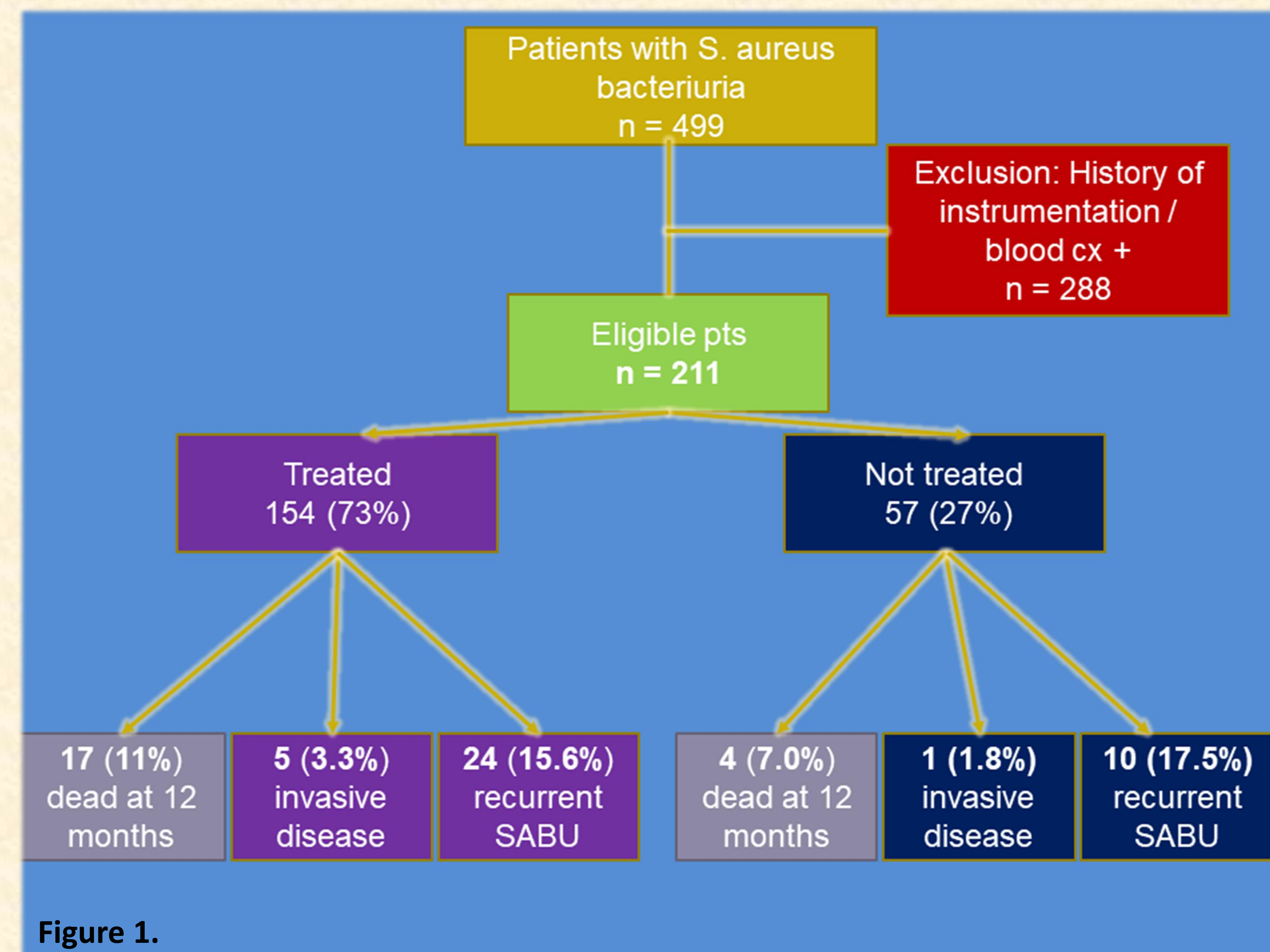


Figure 1.

Table II. Outcomes of *Staphylococcus aureus* bacteriuria: death, development of invasive *S. aureus* disease, or recurrent bacteriuria (n = 211).

Outcomes	Treated n = 154 (%)	Not treated n = 57 (%)	P-value
Death	17 (11.0%)	4 (7.0%)	0.450 ^a
Invasive disease ^b	5 (3.3%)	1 (1.8%)	>.999
Recurrent SABU	24 (15.6%)	10 (17.5%)	0.339

SABU, *Staphylococcus aureus* bacteriuria.
^aStatistical significance determined using Fisher's exact test.
^bInvasive disease: isolation of *S. aureus* from body site in association with disease.

Table I. Demographics and characteristics of patients with *Staphylococcus aureus* bacteriuria (n=211).

	Treated n= 154 (%)	Not treated n=57 (%)	P-value
Age (years)			
Mean ± SD	72 (± 12.4)	70.9 (± 11.5)	0.561
Range	32-98	25-97	
Male	146 (94.8%)	50 (87.7%)	0.126
Comorbidities			
Chronic kidney disease	64 (41.6%)	25 (43.9%)	0.875
Chronic liver disease	19 (12.3%)	5 (8.8%)	0.627
Diabetes mellitus	78 (50.7%)	27 (47.4%)	0.757
Immunocompromised ^a	23 (14.9%)	7 (12.3%)	0.825
Methicillin sensitivity			
MSSA	104 (67.5%)	39 (68.4%)	>.999
MRSA	50 (32.5%)	18 (31.6%)	>.999
Polymicrobial bacteriuria	29 (18.8%)	10 (17.5%)	>.999
Urinalysis			
Microscopic pyuria	136 (88.3%)	36 (63.2%)	<0.001 ^b
Microscopic hematuria	105 (68.2%)	28 (49.1%)	0.016
Colony count			
>10 ⁵ CFU/ml	80 (78.4%)	19 (61.3%)	0.019
<10 ⁵ CFU/ml	45 (29.2%)	27 (47.4%)	0.021
Signs and symptoms of UTI	115 (74.7%)	13 (22.8%)	<0.001
Long-term care	17 (11.0%)	3 (5.3%)	0.291

SD, standard deviation; MSSA, methicillin-sensitive *Staphylococcus aureus*; MRSA, methicillin-resistant *Staphylococcus aureus*; CFU, colony-forming units; UTI, urinary tract infection.
^aPatients were labeled immunocompromised if they had: an active malignancy, receiving biologic agents, or systemic steroids.
^bStatistical significance determined using Fisher's exact test.

CONCLUSION

In our population of mostly 70 year old men with chronic kidney disease, diabetes mellitus, and no prior history urologic instrumentation there was no differences in death, invasive *S. aureus* disease, or recurrent SABU within 12 months of *S. aureus* bacteriuria regardless of antibiotic therapy.

DISCUSSION

- Our study had several limitations:
- Population limited to mostly males (>90%)
 - Not enough outcomes to detect small differences in study cohorts
 - No significant differences in outcomes
 - Lack of documentation in the electronic medical record. Some data was not available.
 - Benign prostatic hypertrophy (BPH) was a common comorbidity, but prevalence was not recorded. It is theoretically possible that patients with BPH are found to have SABU more often.
 - We did not determine if the recurrence of SABU caused disease or not.

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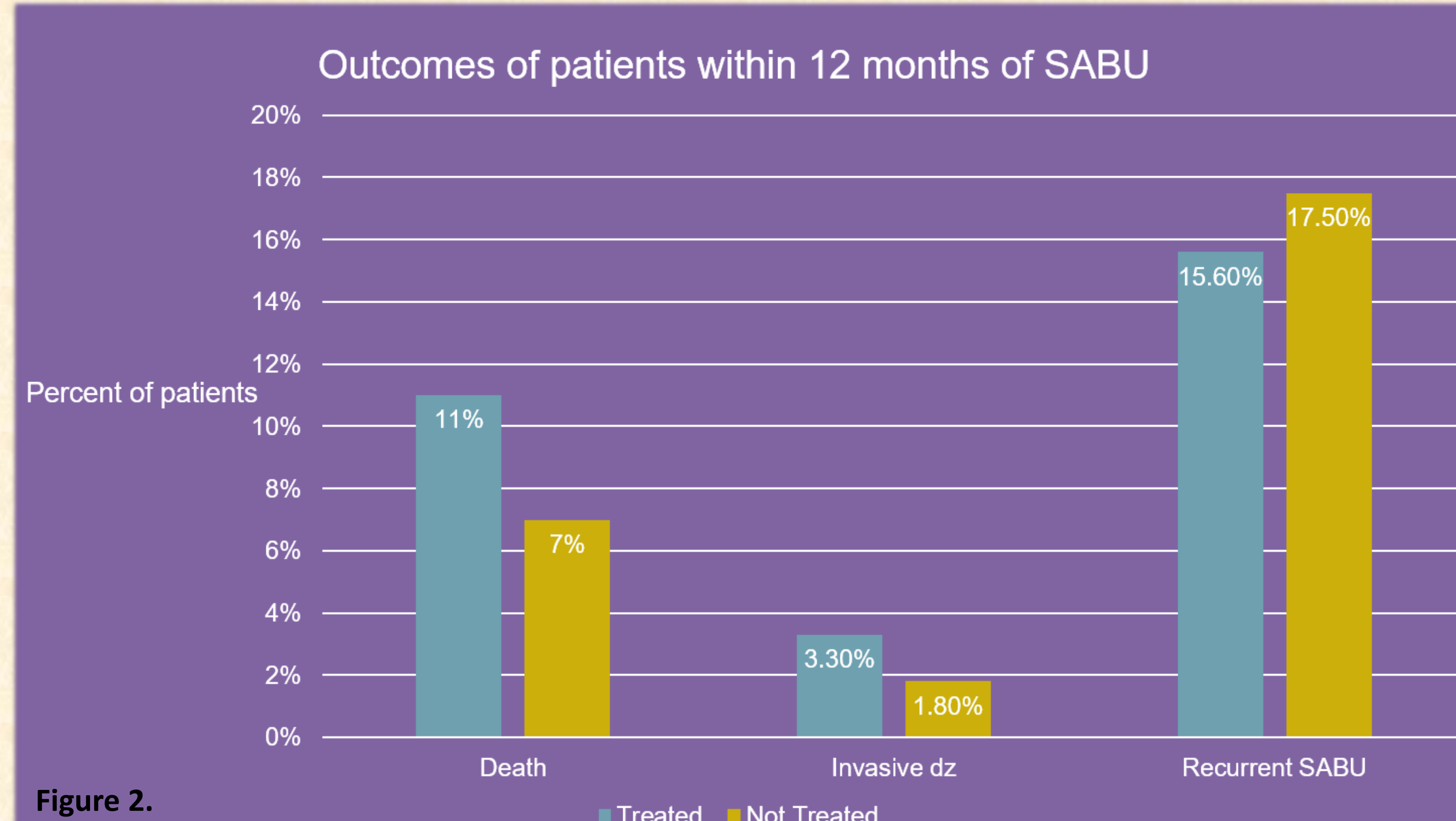


Figure 2.