

Evaluating the Relationship and Appropriateness of Treatment of Obese Patients with Group B *Streptococcus* Bloodstream Infections

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INTRODUCTION

- Research on pregnant females has shown that women with high body mass index (BMI) may be at greater risk for Group B *Streptococcus* (GBS) colonization and neonatal sepsis.
- Further investigation is needed on the relationship between obesity and invasive GBS infections in the general population.
- We hypothesized that obese adults with GBS bloodstream infections (BSIs) are at increased risk of having specific co-morbidities.
- This may place these patients at risk for subtherapeutic dosing of antibiotics, and possibly worse outcomes as compared to non-obese patients overall.

OBJECTIVES

- Primary objective:
- To observe the prevalence rate of obesity in GBS bacteremia and to compare treatment outcomes in obese and non-obese patient populations
- Secondary objective:
- To assess the appropriateness of treatment response based on antimicrobial selection, dosing, and duration

METHODS

- Conducted a retrospective cross-sectional study utilizing chart review
- A patient list was generated by the Microbiology Department
- Using electronic medical records, the following information was documented: patient demographics (e.g., weight, height, body mass index (BMI)), hemoglobin A1C, treatment information, hospital length of stay (LOS), all-cause mortality, admission to critical care unit, 30-day readmission

Inclusion criteria:

- Admitted subjects at Long Island Jewish Medical Center with a positive blood culture for *Streptococcus agalactiae* during the period of Jan 2011 to Dec 2014
- Subjects aged 18 years of age and above

Statistical Analysis

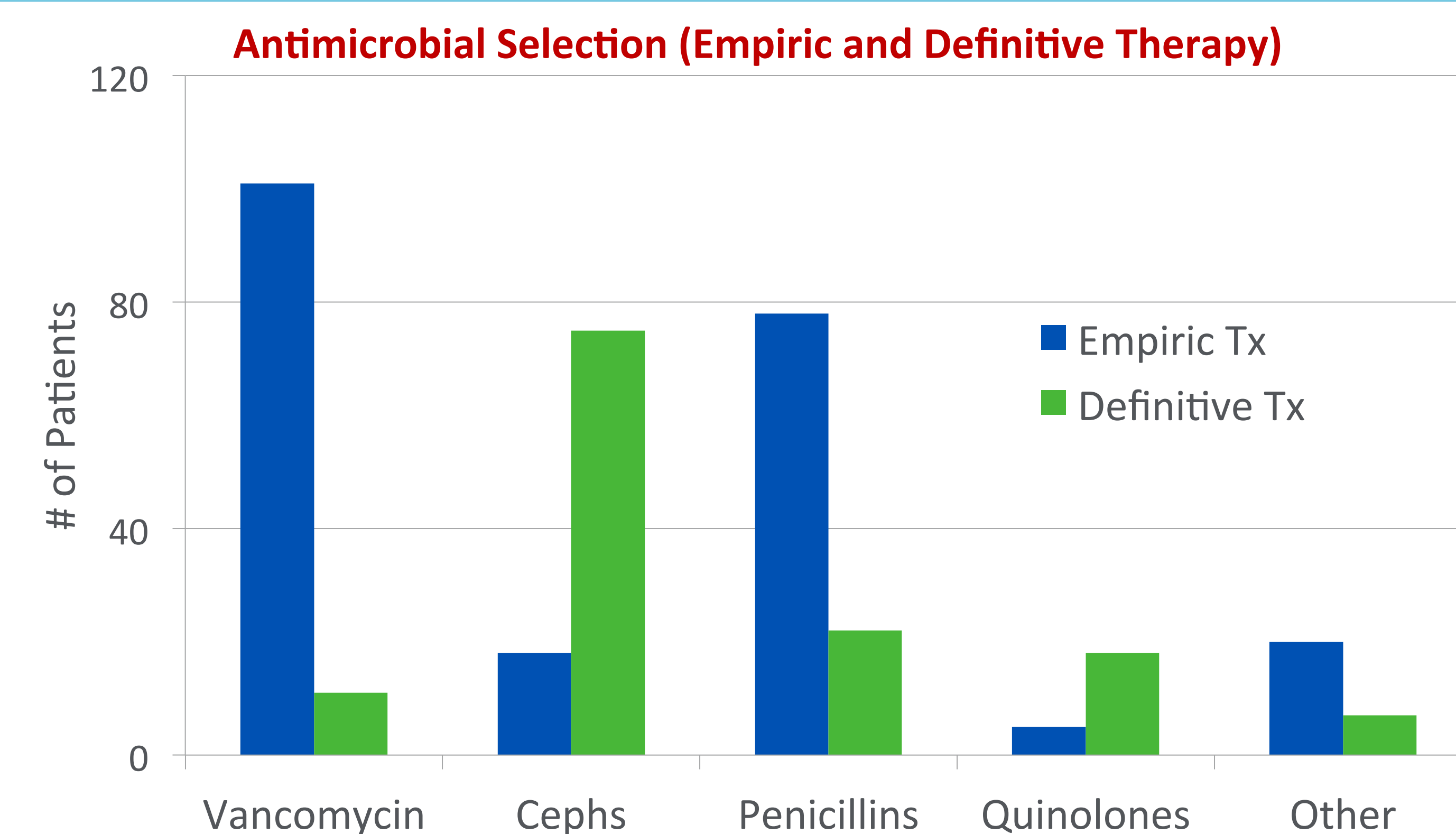
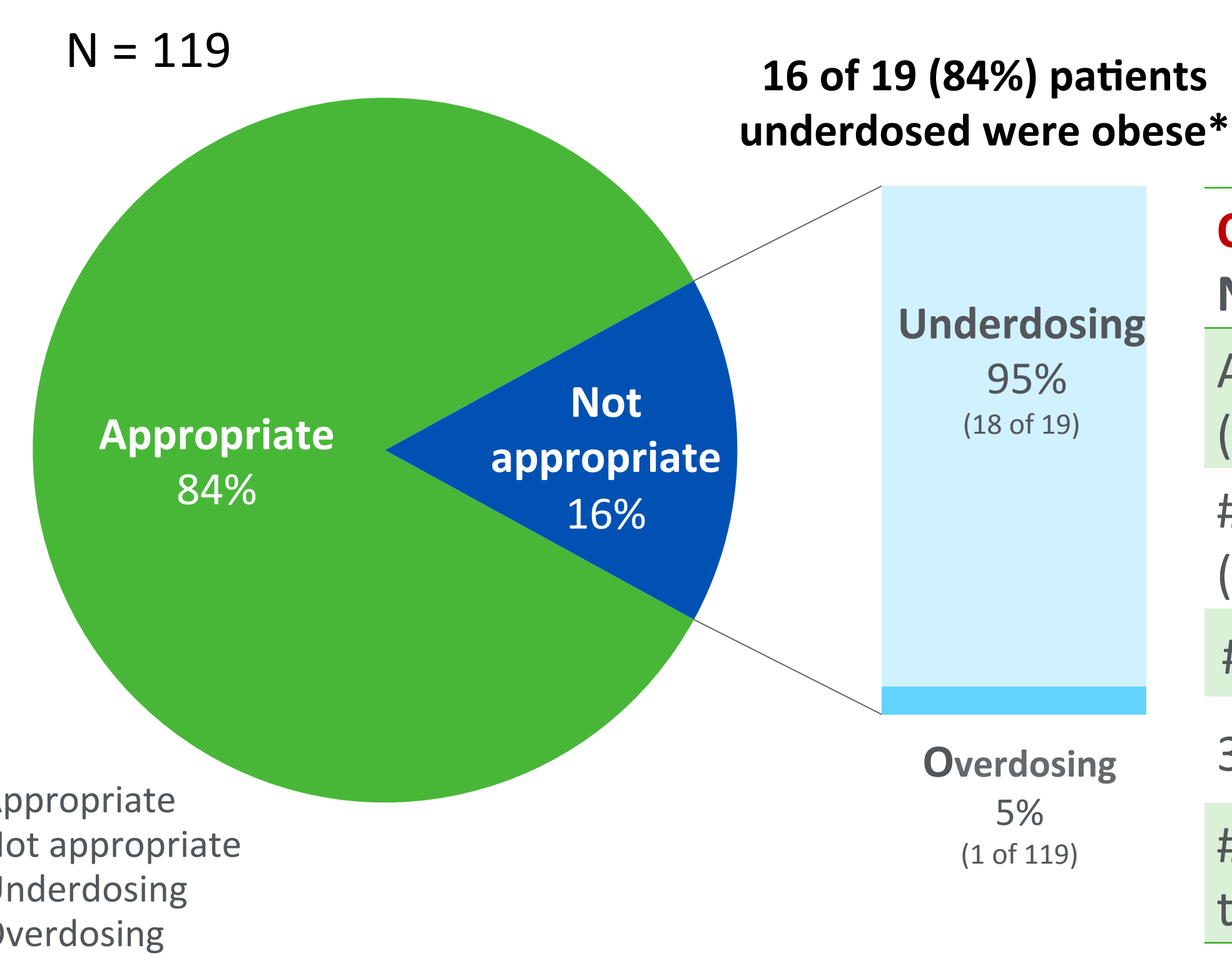
- Chi-Square test for categorical data and analysis of variance for continuous data were used to investigate hypotheses (significance set at $p < 0.05$)

RESULTS

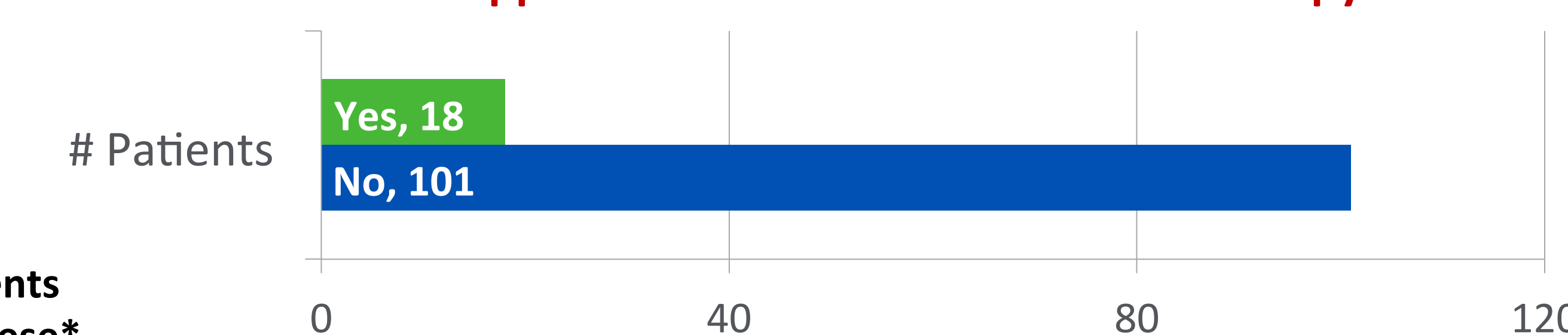
Baseline Characteristics N = 119	Total n (%)	BMI < 30 Subgroup n (%)	BMI ≥ 30 Subgroup n (%)
Male	47 (39.5)	21 (44.7)	26 (55.3)
Female	72 (60.5)	31 (43.1)	41 (56.1)
BMI Range	13.7 – 61.4		
Race			
Caucasian	41 (34.4)	19 (46.3)	22 (53.7)
African-American	34 (28.5)	12 (35.3)	22 (64.7)
Asian	16 (13.4)	8 (50.0)	8 (50.0)
Co-morbidities			
Diabetes*	55 (46.2)	19 (34.5)	36 (65.5)
Chronic kidney disease	32 (26.8)	9 (28.1)	23 (71.8)
Pregnancy/post-partum	10 (8.4)	2 (20.0)	8 (80.0)
Malignancy	25 (21.0)	13 (52.0)	12 (48.0)
Immunosuppression*	10 (8.4)	1 (10.0)	9 (90.0)

Blood Culture Results N = 119	Total n (%)
# of Days until Blood Culture Clearance	0 – 34
Persistence of Bacteremia	6 (5.0)
Isolate Susceptibilities n (%)	
Penicillin	119 (100.0)
Cephalosporins	119 (100.0)
Clindamycin	90 (75.6)
Erythromycin	79 (66.4)
Vancomycin	119 (100.0)
Suspected Source	
Skin and soft tissue	44 (37.0%)
Bone and joint	26 (21.8%)
Endovascular	10 (8.4%)
Pelvic origin	8 (6.7%)

Appropriateness of Antimicrobial Dosing



Missed Opportunities for De-escalation of Therapy



Outcome Measures N = 119	Total N = 119	BMI < 30 n = 53	BMI ≥ 30 n = 66
Average Length of Stay (range in days)	9.9 days (1 – 77)	9.6 days (1 – 43)	10.2 days (4 – 77)
# Patients with ICU Stay (%)	32 (26.9)	14 (26.4)	18 (27.2)
# Patients that Expired (%)	24 (20.2)	14 (26.4)	10 (15.2)
30-day Readmission*	30 (25.2)	9 (16.9)	21 (31.8)
# of Missed Opportunities to De-escalate Therapy	18 (15.1)	6 (11.3)	12 (18.2)

* Indicates that result is statistically significant ($p < 0.05$)

CONCLUSIONS

- Immunosuppressed and DM patients with GBS BSIs have increased rates of obesity
- Inappropriate weight-based dosing of antibiotics is more common among obese GBS patients
- LOS was higher in obese patients, although not statistically significant
- 30-day readmission was higher in obese patients
- This emphasizes the necessity for antimicrobial stewardship program to optimize patient treatment in patients with higher BMIs

ACKNOWLEDGEMENTS & REFERENCES

The Long Island Jewish Medical Center (LIJMC) Microbiology Laboratory

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