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Is Inappropriate Documentation of Penicillin Allergy Related to Overuse of Aztreonam?

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BACKGROUND

- Penicillin allergy is one of the most common drug allergies, with a 10% prevalence in the United States. Only 10% of patients who self-report a penicillin allergy will react if given penicillin, and only 1% will experience an Immunoglobulin E (IgE) mediated reaction if exposed to a cephalosporin or carbapenem³
- Patients who self-report a penicillin allergy are commonly treated with second line antibiotics such as aztreonam, leading to unnecessary adverse events, the development of resistant organisms such as vancomycin-resistant enterococci (VRE), and an increased prevalence of *Clostridioides difficile* infections (CDI)
- A "Beta lactam allergy assessment and alternatives to aztreonam" protocol was implemented at Homestead Hospital (HH), in order to minimize aztreonam usage while optimizing antimicrobial therapy
- Despite improvements in the susceptibility rates of *Pseudomonas aeruginosa* to aztreonam from 59% in 2016 to 64% in 2017, HH continues to have the lowest susceptibility rate within the Baptist Health South Florida (BHSF) system, which might be attributed to the overuse of this antibiotic

PURPOSE

- To determine whether aztreonam overuse is directly associated with inappropriate allergy assessment and documentation
- To evaluate the existing penicillin allergy documentation at HH in order to improve the current "Beta lactam allergy assessment and alternatives to aztreonam" protocol

METHODS

- Retrospective chart review of 154 patients who received aztreonam from June 1st 2017 to July 31st 2018
- Patients 18 years and older who received aztreonam within the aforementioned time frame were included in the study
- Each chart was reviewed to determine appropriateness of allergy documentation, previous beta lactam administration and tolerance, concomitant antibiotic use, and appropriateness of aztreonam indication
- The criteria used to assess allergy documentation were severity and description of event, in accordance to the HH protocol
- The use of aztreonam was considered inappropriate in the absence of a documented severe penicillin allergy or in patients for whom beta lactam antibiotics were administered without an allergic reaction according to current guidelines and HH protocols

RESULTS

Beta lactams administered to patients self reporting penicillin allergy N(%)

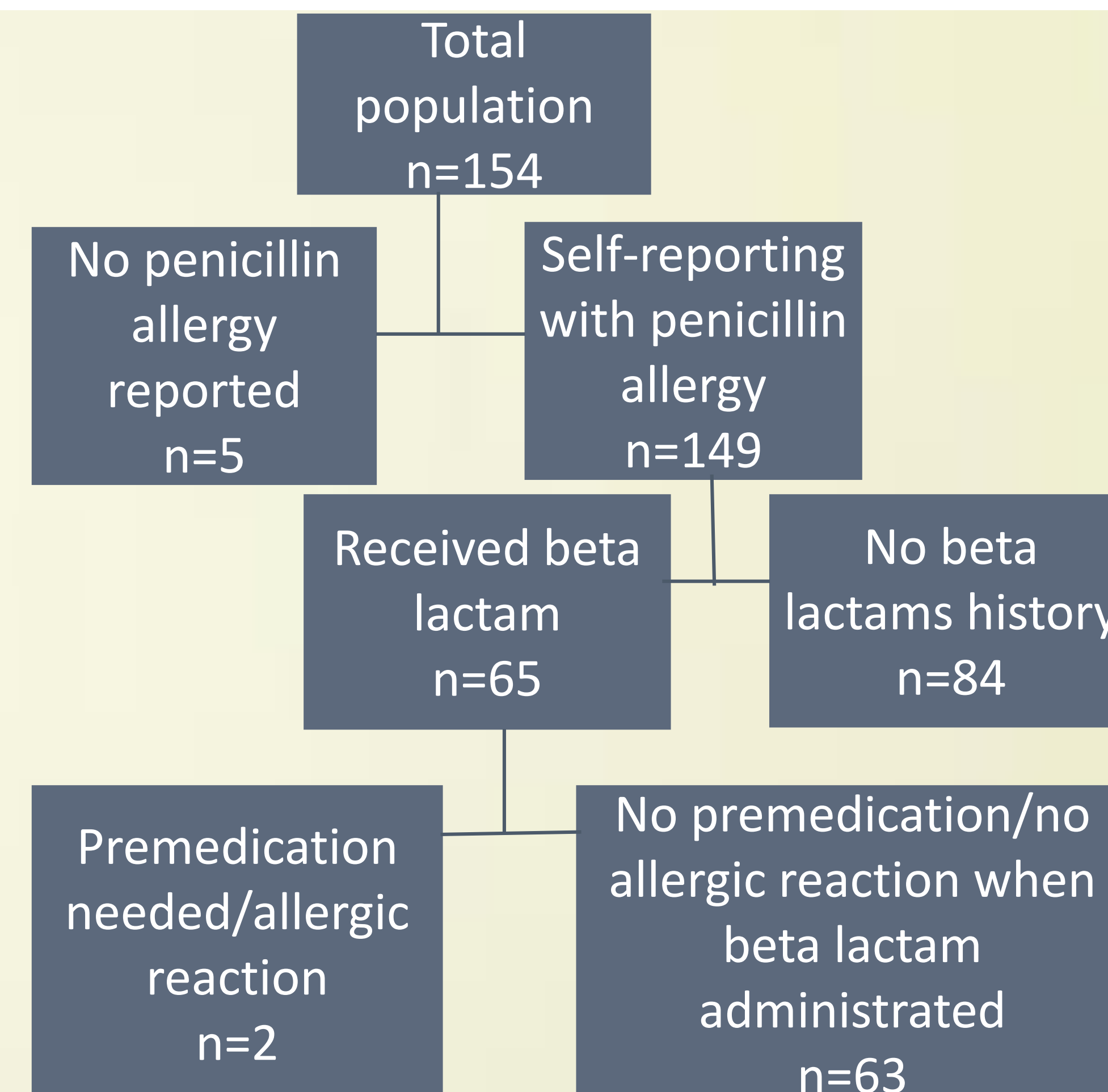
Piperacillin/Tazobactam	4 (6%)
Amoxicillin	1 (1.5%)
1 st generation cephalosporins	3 (4.6%)
2 nd generation cephalosporins	1 (1.5%)
3 rd generation cephalosporins	24 (37%)
4 th generation cephalosporin	20 (31%)
5 th generation cephalosporin	1 (1.5%)
carbapenems	22 (34%)

Demographic (n=149)

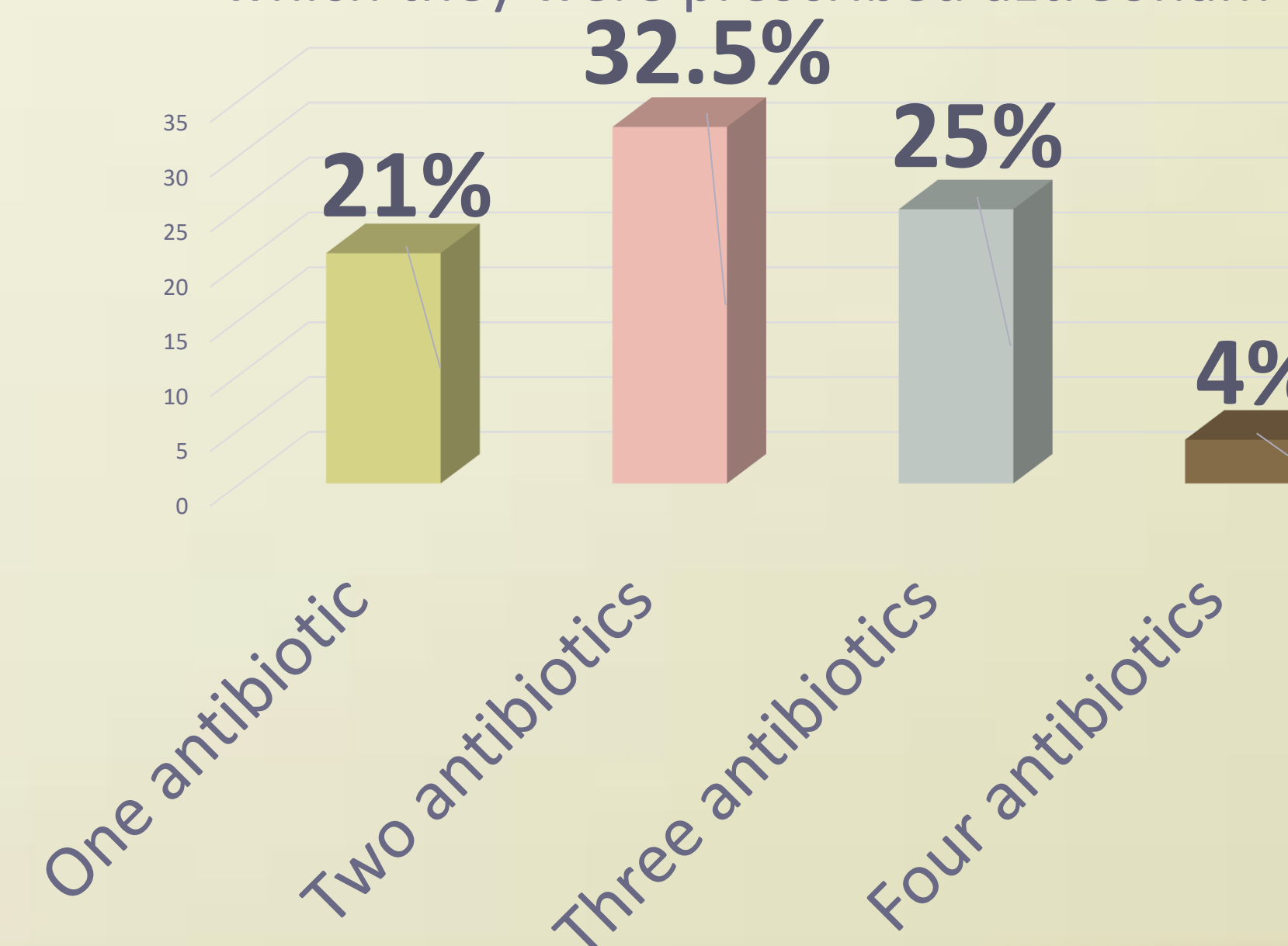
African American	16
Asian	1
Hispanic	86
White	46

Gender

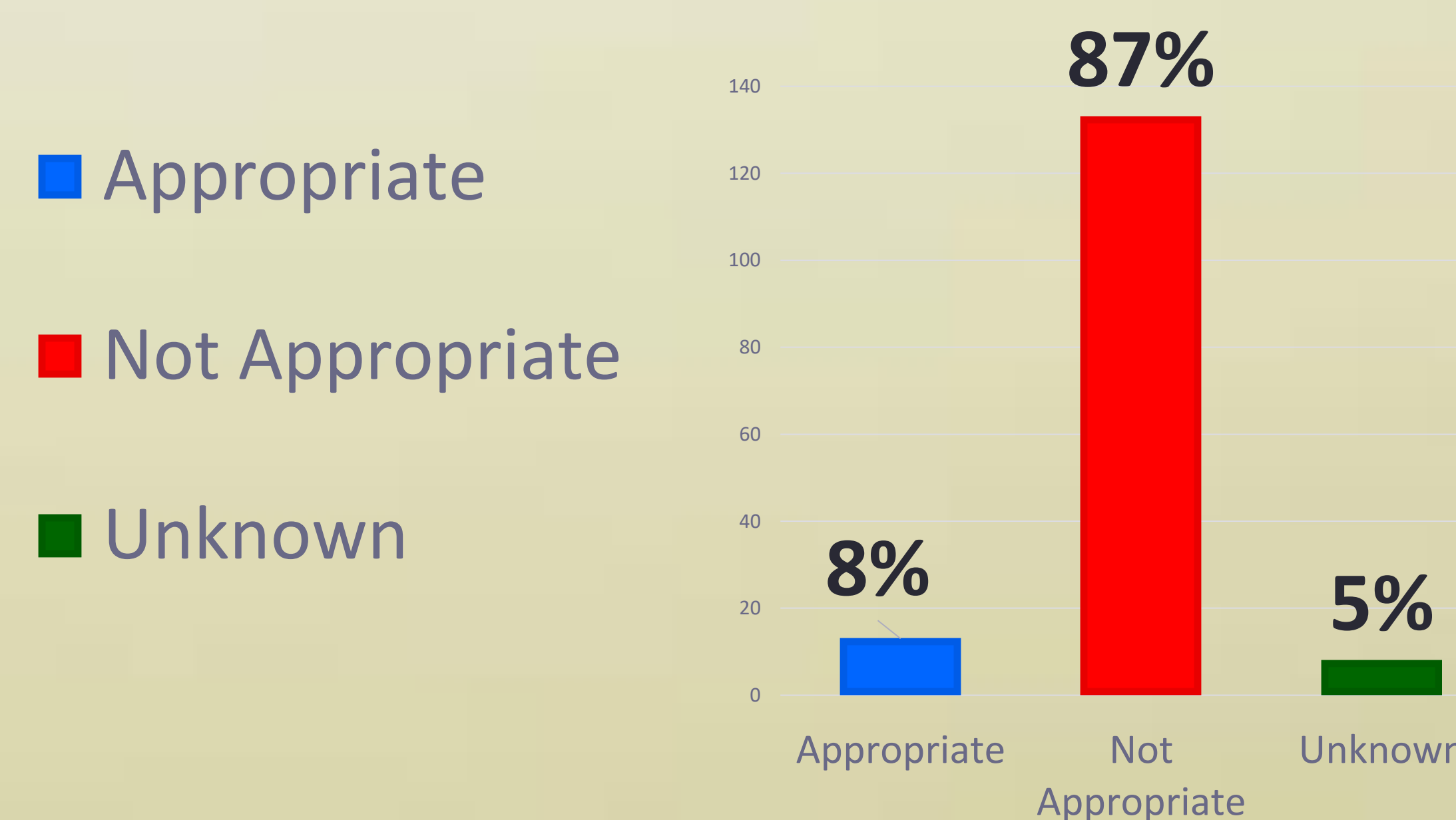
Male	67
Female	82



Percent of patients who received additional antibiotics during the hospital admission in which they were prescribed aztreonam



AZTREONAM APPROPRIATENESS OF USAGE



DISCLOSURE

All authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have direct or indirect interest in the subject matter of this presentation.

RESULTS

- At HH, 149 (96.75%) patients receiving aztreonam self-reported a penicillin allergy
- 65 (44%) patients received a beta lactam despite self reporting a penicillin allergy, and 63 (97%) of them tolerated the antibiotic uneventfully
- 84 (56%) patients reporting a penicillin allergy did not receive a beta lactam antibiotic. Of these, only 19 (23%) reported a severe penicillin allergic reaction
- Beta lactams administered to patients who self-reported a penicillin allergy included 3rd generation cephalosporins (37%), carbapenems (34%), and 4th generation cephalosporin (31%)
- Allergies were inappropriately documented in 77 (50%) patients, with description of allergy being the most common missing parameter
- 127 (85%) patients received multiple antibiotics. 32 (21%) patients received one additional antibiotic; 50 (32.5%) received two antibiotics; 39 (25%) received a combination of three antibiotics, and 6 (4%) received 4 antibiotics. The most common antimicrobial agents were vancomycin, levofloxacin and clindamycin
- 73 (53%) patients receiving aztreonam were prescribed a second line agent due to the monobactam's narrow spectrum of coverage
- Aztreonam was inappropriately used in 133 (87%) patients. The indication assessment for this antibiotic was not feasible in 8 (5%) patients due to inappropriate allergy documentation

CONCLUSION

In this retrospective chart review it was found that inappropriate penicillin allergy documentation leads to aztreonam overuse. Due to the narrow spectrum of coverage of aztreonam, patients required multiple antibiotics, including vancomycin, levofloxacin, and clindamycin. Although the impact of this on drug resistance such as VRE, CDI prevalence, and antibiotic-associated adverse events was not an endpoint in our study, we acknowledge these are potential consequences of inappropriately labeling patients with penicillin allergy.

Further studies addressing the implications of multiple antibiotic use in patients self reporting a penicillin allergy is recommended.

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