Optimizing the Management of Coagulase-negative Staphylococci (CoNS) Contaminants by Reporting the Species Name

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Background

- CoNS often represent contaminants in blood cultures[1]
- Species identification and susceptibility patterns can be used to guide whether antimicrobial therapy is indicated[2]
- CoNS species reporting was implemented at Wake Forest Baptist Medical Center on 8/20/2019

Objective

- Determine how implementation of species-specific reporting of CoNS affects use of anti-staphylococcal antibiotics at an academic medical center

Methods

- Single-center, retrospective, observational before-and-after study
- Patient identification via computer-generated report of CoNS positive blood cultures before and after implementation of CoNS species reporting
- CoNS species name was hidden to providers in the before group
- In each period, a random sample of patients were screened until 50 patients with only 1 blood culture positive for CoNS was included
- Additional data were collected until at least 50 patients with ≥ 2 blood cultures were included in each period
- Patients were grouped and analyzed according to number of CoNS isolates (1 vs ≥ 2). Those with ≥ 2 isolates were further categorized using same or different species, and same or different susceptibilities
- Review of the electronic medical record was performed to collect patient data and lab results
- Data analyzed using Chi-square or Fisher's exact test (categorical data) and Student's *t*-test (continuous data)

Methods (cont.)

Table 1. Inclusion and Exclusion Criteria

Inclusion	Exclusion
Age ≥ 18 years	Absolute neutrophil count (ANC) ≤ 1000 cells/mm^3
At least 1 blood culture positive for CoNS	Patients with infection other than CoNS
Inpatient from Jan-Jun 2017 (before) and Sep 2019-Feb 2020 (after)	Use of antibiotics that were not pre-defined as SAbx

PRIMARY OUTCOME

- Use of SAbx among patients in each group before and after species reporting

SECONDARY OUTCOMES

- Days of therapy (DOTs) and defined daily dose (DDD) per patient among subsets of patients with same/different species and/or susceptibilities

Definitions

- **Anti-staphylococcal antibiotic (SAbx)**: Cefazolin, daptomycin, oxacillin, nafcillin, vancomycin
- **Days of Therapy (DOT):** Number of calendar days that the patient received at least one dose of SAbx
- **Defined Daily Dose (DDD):** Drug consumption based on average maintenance dose in adults
  - Cefazolin – 3 grams
  - Daptomycin – 500 mg
  - Oxacillin – 12 grams
  - Nafcillin – 12 grams
  - Vancomycin – 2 grams

Results

Figure 1. Patient Screening

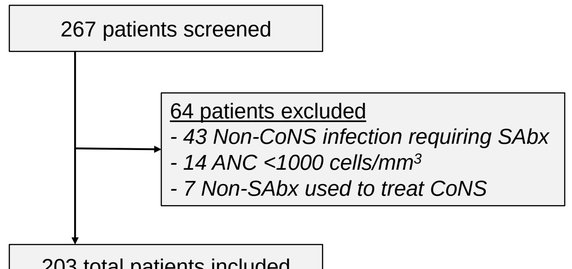

Table 2. Patient Characteristics

	Before (n = 102)	After (n = 101)
Age (years), mean ± SD	61.8 ± 17.8	60.9 ± 15.5
Male gender, n (%)	63 (62)	51 (49)

Table 3. Distribution of CoNS Isolates by Species

	Before (n = 181)	After (n = 168)
S. epidermidis, n (%)	117 (65)	97 (58)
S. hominis, n (%)	35 (19)	27 (16)
S. capitis, n (%)	16 (9)	31 (18)
Other, n (%)	13 (7)	13 (8)

- Among patients with 1 CoNS isolate, the median days of therapy per patient was 1 in both periods
- Vancomycin was the most commonly administered SAbx (97%)

Results (cont.)

Table 4. SAbx Use

	Before (n = 102)	After (n = 101)
DOT, median (IQR)	3 (1-7)	2 (1-5)
DDD, median (IQR)	2.2 (0.5-5.6)	1.6 (0.6-3.9)

Table 5. Median SAbx DOTs Per Patient with ≥ 2 Positive Cultures

		Species					
		Same			Different		
		Before	After	p-value	Before	After	p-value
Susceptibilities	Same	7.5 (n=22)	5.0 (n=24)	0.24	5.5 (n=6)	1.0 (n=6)	0.18
	Different	5.0 (n=13)	1.0 (n=11)	0.09	6.0 (n=11)	2.5 (n=10)	0.48

Conclusions

- CoNS species reporting was associated with less SAbx use for patients with ≥ 2 positive blood cultures, suggesting that knowing the species helps determine the likelihood of true infection
- Stewardship metrics of SAbx, especially vancomycin, may be improved by implementing CoNS species reporting of positive blood cultures

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DISCLOSURES: Neither the primary investigator nor members of the research team have financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation