A Multicenter Evaluation of Cardiovascular Implantable Electronic Device (CIED) Infection Management

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MODIFIED ABSTRACT

Multicenter, retrospective cohort study examining adherence to American Heart Association (AHA) guidelines for appropriate duration of antimicrobial therapy in CIED infections. A total of 86 patients fit inclusion criteria for this review. Mean (±SD) age was 72 (±11.2) years, with 83% males. The most common sites of infection were pocket (68%), bloodstream (54.4%), valve vegetation (27.8%), and endocarditis (24%). Fifty percent of patients were diagnosed with an S. aureus positive blood culture. In patients with a retained CIED, 2/18 received appropriate abx suppressive therapy. Most narrow spectrum therapy was used to manage the retained CIED in approximately half of patients. A new CIED was implanted in 43% of patients. In these S. aureus positive patients, 30% did not receive the narrowest spectrum therapy. Abx therapy duration was dependent on infection type, site, and utilizing suppressive abx therapy if the infected CIED is retained.

RESULTS

- CIED Infections
- Type of CIED
- Pocket site: 69 (80.2%)
- Bloodstream: 23 (26.7%)
- Persisting bloodstream: 6 (6.9%)
- Endocarditis: 21 (24.4%)
- Generator/lead erosion: 12 (13.9%)
- Osteomyelitis: 1 (0.1%)
- Positive cultures (n=54, 63%)
  - Blood: 27 (31.4%)
  - Wound: 19 (22.1%)
- Positive blood culture (n=23, 31.2%)
  - Valve vegetation: 13 (31%)
  - Complicated lead vegetation: 13 (31%)
  - Uncomplicated lead vegetation: 9 (24.1%)
- Negative: 21 (50%)

- Primary and Secondary Objectives
- CIED extracted or retained
- TEE results
- Timing of new CIED implantation
- Statistical tests analyzed using SPSS-PC
- p-value < 0.05 significant

BACKGROUND

- 2010 AHA Updated CIED guidelines standard of care for CIED-I
- Removal infected device
- Abx choice targeting identified pathogens and susceptibility
- Duration abx therapy dependent on infection type
- Timing of implantation of new CIED
- Long-term suppressive therapy for retained CIED
- Lack of literature evaluating abx use in infection
-Evaluated abx treatment in CIED-I and level of adherence to AHA guidelines

METHODS

- Multicenter, retrospective cohort study
- January 2011 to December 2014
- Inclusion: >18 years of age with CIED
- Exclusion: CIED not extracted or retained, TEE results, and wound
- Duration abx therapy dependent on infection type and utilizing suppressive abx therapy if the infected CIED is retained.

RESULTS

- Demographics
  - Age, yr: 72 ± 11.2
  - Male, n (%): 56 (62.3%)
  - WT, kg: 86.5 ± 27.8
  - BMI: 28.4 ± 6.2
  - WBC, K/ul: 9.1 ± 4.7
- CIED extracted (n=68)
  - Mean ± SD: 69 (80.2%)
- CIED not extracted (n=18)
  - Mean ± SD: 23 (26.7%)
- p-value = 0.015

- CIED infections
  - Positive cultures
  - Blood: 27 (31.4%)
  - Wound: 19 (22.1%)
  - Valve vegetation: 13 (31%)
  - Complicated lead vegetation: 13 (31%)
  - Uncomplicated lead vegetation: 9 (24.1%)
  - Negative: 21 (50%)

- TEE completed (n=42, 48.8%)
  - Valve vegetation: 13 (31%)
  - Complicated lead vegetation: 13 (31%)
  - Uncomplicated lead vegetation: 9 (24.1%)
  - Negative: 21 (50%)

- Met AHA guidelines abx duration post extraction (n=68)
  - Yes: 44 (64.7%)
  - No: 24 (35.3%)

- Implantation of new CIED post extraction (n=68)
  - Yes: 37 (54.4%)
  - No: 31 (45.6%)

- Met AHA guidelines timing of implantation and first negative blood cultures (n=16, 43.2%)
  - Retained CIED and received abx suppressive therapy
  - Yes: 16 (88.9%)
  - No: 2 (11.1%)

CONCLUSIONS

- Multiple opportunities for improvement to meet AHA guidelines-adherent management of CIED-I
  - Obtaining a TEE
  - Removal of infected CIED
  - Streaming antibiotic therapy based on isolated organism
  - Appropriate indication-based duration of therapy
  - Suppressive antibiotic therapy in retained infected CIED
- Repeating blood cultures to determine first negative blood culture and timing of new CIED

DISCUSSIONS

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation: Nothing to Disclose

[1] Creighton University School of Medicine, Creighton University School of Pharmacy & Health Professions, Creighton University School of Health Care Systems, Creighton University School of Pharmacy & Health Professions; Creighton University School of Medicine, CHI Bergan Mercy Hospital, Omaha, NE; Bryan Health, Lincoln, NE.