MAINE MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE

Journal Club / Research Article Summary - (Adapted from Schultz Table)

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Presenter: Ryley Enz

ARTICLE:
- Citation: Arthur Jeng, MD, Manie Beheshti, MD, John Li, MD, and Ramesh Nathan, MD. The Role of A-Hemolytic Streptococci in Causing Diffuse, Nonculturable Cellulitis A Prospective Investigation. Medicine, Vol 89:4, July 2010.
- Country: USA
- Funding Sources: This study was funded by grants from Olive View-UCLA Central Resource Management (CRM) and Olive View SEED Awards (2005, 2006) via the Education and Research Institute (ERI).

PURPOSE:
- Research Question(s): What proportion of non-culturable cellulitis is caused by Beta-hemolytic streptococci (BHS)?

DESIGN:
- Study Design: Prospective Study
- The primary outcome was the proportion of admitted cellulitis cases caused by BHS, as diagnosed by serologies and/or blood cultures, and the secondary outcome was the response rate of patients to Beta-lactam antibiotics.

SETTING / SUBJECTS:
- Research Setting: Inpatient setting between December 2004 and June 2007 at Olive View-UCLA Medical Center, a county hospital of Los Angeles.
- Subjects: All patients aged 18 years or older admitted with the diagnosis of cellulitis or soft-tissue infections were screened during the study period. Patients were recruited for the study if the cellulitis was diffuse and lacked a culturable source (for example, abscess, furuncle, wound, ulcer). Exclusion criteria were infections involving periorbital, perineal, and groin regions; animal/human bites; and foreign objects; and patients with neutropenia (absolute neutrophil count G500/mm³), necrotizing fasciitis, gangrene, myositis, or osteomyelitis and having had a soft-tissue infection or pharyngitis within the past year, due to confounding issues with interpretation of the serologies.
  - Number (control / intervention groups): 248 eligible patients; 69 patients were excluded for the following reasons: 62 were lost to follow-up (lacking convalescent serologies), 4 were diagnosed with abscesses after
enrollment, and 3 were diagnosed with osteomyelitis. The remaining 179 patients completed the study.

- **Demographics:** Mean age 47.9 years with a slight male predominance (67.6%). Slightly over half (58.7%) of the patients had at least 1 of 5 common risk factors for cellulitis, including diabetes mellitus, cirrhosis, lymphedema, history of recurrent cellulitis, and/or obesity. The majority of patients had cellulitis of the lower extremity (75.8%), followed by upper extremity (15.2%), trunk (5.6%), and face (3.9%).

**METHODS:**

- **Interventions:** All patients underwent a venipuncture during their hospital stay for ASO and ADB antibodies, which represented the acute serologies. ASO is expected to rise within 2 weeks of infection for GAS, GCS, and GGS, and ADB in a similar time period for GAS; both anti-body titers should decline in 3-6 months. Patients were asked to return to the Infectious Diseases Clinic within 2-12 weeks to assess clinical response and to obtain a second blood draw for ASO and ADB, which represented the convalescent serologies. A **positive result** was defined by seroconversion from acute to convalescent phase.

  - All participants who received >48 hours of treatment and who did not receive >1 dose of antibiotic active against MRSA (for example, vancomycin, clindamycin, trimethoprim-sulfamethoxazole, tetracycline, daptomycin, linezolid, tigecycline) were analyzed for their response to the Beta-lactam antibiotics. The admitting physicians were asked to use a gram-positive Beta-lactam, preferably cefazolin or oxacillin, on study patients.

**DATA ANALYSIS:**

- **Level of Data:** Interval Data
- **Statistics Used:** Descriptive statistics

**RESULTS:**

- **Brief answers to research questions:** Overall, 73.2% (131/179) of patients were diagnosed with BHS infections, by virtue of positive serologies and/or blood cultures, with 126 patients seropositive for ASO, ADB, or both.

  - **Additional findings:** Of the 131 cases positive for BHS 58 could not be evaluated because of empirical (>1 doses) use of agents active against MRSA. This left 73 cases eligible and 97% (71/73) clinically responded to the Beta-lactams with 2 failures. Of those who were negative for BHS 25 could not be evaluated. This left 23 cases eligible and 91% (21/23) of patients responded to Beta-lactam antibiotics, suggesting a low incidence of MRSA.

- **Limitations:** Adherence to study design which led to decreased eligible cases for evaluation.
IMPLICATIONS FOR PRACTICE:
- Applicable to this clinical practice: Yes, is applicable. Ethnically diverse city.
- Feasible (cost, resources, etc): Yes
- Clinically Relevant: Clinically significant

LEVEL OF EVIDENCE / DECISION FOR USE:
- Level of Evidence:
  □ Ia Evidence obtained from meta-analysis of randomized controlled trials
  □ Ib Evidence obtained from at least one RCT
  □ IIa Evidence obtained from at least one well-designed controlled study without randomization
  □ IIb Evidence obtained from at least one other type of well-designed quasi-experimental study
  □ II Well-designed non-experimental studies
  □ IV Expert committee reports, opinions of experts