



## INFECTIOUS DISEASES NEWSLETTER

**December 2018**

Thomas Herchline, Editor

### LOCAL NEWS

#### **Montgomery County Mosquito Surveillance and Control**

October brought an end to Public Health's mosquito surveillance and control activities for 2018. This year, with the assistance of two Wright State University Environmental Health interns, Public Health collected 9,466 mosquitoes from 125 different trap locations in Montgomery County. This resulted in 410 mosquito pools being tested, with 71 testing positive for West Nile Virus. A mosquito pool consists of a collection of up to 50 mosquitoes that are submitted to the Ohio Department of Health laboratory for testing. State-wide there were 16,902 mosquito pools tested. In Montgomery County 17% of the mosquito pools tested positive for WNV, which was similar to the state-wide percentage (19%). There were three confirmed human cases of WNV reported in Montgomery County with a total of 57 cases occurring in 25 other counties. In response to WNV positive mosquito pools, Public Health conducted truck-mounted applications of mosquito adulticides on 8 separate occasions. There were no locally-acquired human cases of Zika Virus reported in Ohio. The mosquito species capable of spreading the Zika Virus was found in 4% of the mosquitoes collected in Montgomery County (compared to 1% statewide).

#### **Montgomery County Hepatitis A**

Hepatitis A outbreaks have been occurring in multiple states across the U.S., including several bordering Ohio. The Ohio Department of Health declared a statewide community outbreak for Hepatitis A on June 22. As of October 29, Ohio had 761 confirmed cases and Montgomery County had a total of 148 cases. Public Health's Incident Management Team continues to provide educational materials, inform medical response partners, update the media, and hold Hepatitis A vaccination clinics for high risk populations. Public Health has conducted a total of 76 external vaccination clinics for Hepatitis A with 2247 individuals being vaccinated. These clinics targeted the Montgomery County jail, homeless populations, men who have sex with men and individuals abusing drugs. In addition, 474 vaccinations have been provided at the Public Health Clinic.

### EMERGING INFECTIONS NETWORK

#### **Query: Oral Antibiotics for Bacteremia**

There were 655 respondents (50% of EIN members with an adult ID practice). There were 78 respondents (12%) who reported that they do not ever treat bacteremia with oral antibiotics. Of the other 577, nearly all (575) would be willing to transition patients with Gram negative bacteremia

to oral therapy, with fluoroquinolones as the leading choice. A lesser number, 466 (71% of all respondents) would be willing to switch patients to oral therapy to complete a course of treatment for Gram positive bacteremia. Linezolid or beta-lactams were preferred for Streptococcal bacteremia; only 88 (13%) of respondents were willing to use oral antibiotics for Staphylococcal bacteremia.

## NATIONAL NEWS

### **E coli O157 Outbreak**

Thirty-two people infected with the outbreak strain of Shiga toxin-producing *E. coli* O157:H7 have been reported from 11 states. Illnesses started on dates ranging from October 8, 2018 to October 31, 2018.

As of November 20, thirteen people have been hospitalized, including one person who developed hemolytic uremic syndrome. No deaths have been reported. Ill people in this outbreak were infected with *E. coli* bacteria with the same DNA fingerprint as the *E. coli* strain isolated from ill people in a 2017 outbreak linked to leafy greens. CDC initially advised that U.S. consumers not eat any romaine lettuce, and retailers and restaurants not serve or sell any, until more is learned about the outbreak. Consumers who have any type of romaine lettuce in their home should not eat it and should throw it away, even if some of it was eaten and no one has gotten sick. Consumers are advised to wash and sanitize drawers or shelves in refrigerators where romaine was stored. This advice includes all types or uses of romaine lettuce, including bags and boxes of precut lettuce and salad mixes that contain romaine, including spring mix and Caesar salad. On November 26, the FDA reported that only romaine lettuce from parts of California was unsafe and going forward, romaine lettuce would be labeled wither when and where it was harvested. Clinicians are advised that antibiotics are not recommended for patients in whom *E.coli* O157 infection is suspected, until diagnostic testing rules out this infection. Studies have shown that administering antibiotics to patients with *E. coli* O157 infections might increase their risk of developing hemolytic uremic syndrome. This investigation is ongoing, and CDC will provide more information as it becomes available.

### **Influenza Activity**

According to the Centers for Disease Control and Prevention (CDC), the spread of influenza is regional in 5 states, local in 16 states (including Ohio), sporadic in 28 states, with no activity in 1 state. The early results of genetic typing of influenza virus from this season shows good match to the vaccine strains. In the 10 county regional area, there have been 16 cases of influenza A and 4 cases of influenza B since October 14, with 12 influenza-related hospitalizations.

## INTERNATIONAL NEWS

### **Ebola in Democratic Republic of the Congo**

As of November 26, there have been 419 cases with 240 deaths in the current outbreak. There have been nearly 36,000 people vaccinated with the Merck experimental vaccine and the WHO is coordinated the use of several experimental treatments. Over 160 infected patients have received

one of these treatments so far. The experimental treatments include monoclonal antibodies and antivirals with activity against filoviruses.

### **Fractional Dosing of Yellow Fever Vaccine**

Administration of a one-fifth dose of yellow fever vaccine resulted in long-term protection against the virus, according to a study by Anna H.E. Roukens, MD, PhD, from the Netherlands, published in *Annals of Internal Medicine*. Outbreaks of yellow fever and a frequently depleted vaccine stock has prompted the use of a dose-sparing strategy. A fractional dose of 17D yellow fever virus (17D-YFV) vaccine was shown to be noninferior to the standard dose in inducing seroprotection. Roukens and colleagues performed a 10-year follow-up analysis of a randomized, controlled, noninferiority trial to determine if a fractional-dose vaccine provides long-term immunity of yellow fever. The researchers evaluated a subgroup of patients from the trial who provided a blood sample and received primary vaccination with 17D-YFV vaccine 10 years prior (n = 75). Among these participants, 40 received a 0.1 mL fractional dose intradermally and 35 received the standard 0.5 mL dose subcutaneously. The researchers used a plaque reduction neutralization test to measure virus-neutralizing antibody responses. Data showed that a majority of participants who received a fractional dose of 17D-YFV vaccine (98%; 95% CI, 89-100) demonstrated seroprotection from yellow fever—neutralizing antibodies more than 10 years after receiving the vaccine. This protection was similar to that of participants who received the standard dose of the vaccine — 97% (95% CI, 87-100) of whom indicated protective levels against the virus.

**CASE CONFERENCE**  
Contributed by Najmus Sahar

A 40-year-old female presented with fever, chills, and painful swollen left hand and left foot. She is a heroin/methamphetamine addict and her last dose was on the day of presentation when her friend injected methamphetamine in her left cubital fossa. She was brought to emergency department after being found down on street moaning and groaning in pain. At admission her the dorsum of both hands was red, painful, and swollen as was the left foot. She has had methicillin sensitive staphylococcus aureus (MSSA) endocarditis of tricuspid valve 3 years prior to current presentation, and chronic hepatitis C and multiple I&D procedures done for recurrent abscesses in past.

She had no drug allergies and was not on any medications at home. Her temperature was 101F, pulse 130 bpm, blood pressure 126/76 mmHg, and respiratory rate 20 bpm saturating 94% on room air. She had systolic murmur along left sternal boarder without any other stigmata of endocarditis. She had needle stick marks on both arms and erythematous, edematous tender hands and dorsum of left foot. Laboratory work up revealed normal complete blood count, basic metabolic panel, lactic acid, and mildly elevated AST at 65 u/L and total bilirubin 1.4 mg/dL. Two sets of blood cultures were obtained before empirical antibiotic therapy was initiated for skin and soft tissue infection and was admitted for further investigations. Both sets of blood cultures grew Abiotrophia species, and 1 out of 2 sets grew Acinetobacter species. See below:

ANTIBIOTIC SUSCEPTIBILITY	ACINETOBACTER SPECIES MIC	ABIOTROPHIA SPECIES MIC
CEFEPIME	<= 4 S	8 R
CEFTRIAZONE	<=8 S	2 IM
CLINDAMYCIN		<=0.12 S
ERYTHROMYCIN		>2 R
GENTAMICIN	<=4 S	
LEVOFLOXACIN	<= 2 S	2 S
MEROPENEM		0.5 S
PENICILLIN		1 IM
TETRACYCLINE	<=4 S	
TMP/SUL	<=2/38 S	
VANCOMYCIN		1 S

S= sensitivity, R= resistance, IM= intermediate

Transesophageal echocardiogram revealed a 1.0 x 0.5 cm vegetation attached to tricuspid valve along with 0.5 x 0.36 cm vegetation on mitral valve. Repeat blood cultures after 3 days remained negative. Patient was managed medically with intravenous ceftriaxone and gentamicin with plan for 6 weeks of therapy. She was seen in infectious diseases clinic for follow up at the end of therapy and was feeling much better.

**Discussion**

Abiotrophia species belongs to the group of nutritional variant streptococci (NVS), and has been allocated with culture negative endocarditis (CNE) in the past. CNE is defined as clinical and/or echocardiographic evidence of infective endocarditis (IE) but at least 3 blood cultures remain

negative after 7 days of incubation period. Approximately 5-7% of patients with IE will have sterile blood cultures. Recent use of antibiotic therapy and infection with fastidious organisms are the most common reason for CNE.

### **COMMON CAUSES OF CULTURE NEGATIVE ENDOCARDITIS**

**ABIOTROPHIA SPECIES**

**COXIELLA BURNETTI (Q FEVER)**

**BARTONELLA SPECIES**

**HACEK ORGANISM**

**CHLAMYDIA SPECIES**

**TROPHYMA WHIPPLEI**

**LEGIONELLA SPECIES**

**BRUCELLA SPECIES**

**ASPERGILLUS SPECIES**

**LACTOBACILLUS SPECIES**

Nutritional variant streptococci (NVS) are fastidious Gram-positive bacteria, first observed by Frenkel and Hirsch in 1961. They are part of the normal human oropharyngeal, gastrointestinal and urogenital flora, and require pyridoxal and cysteine -supplemented media to grow. They usually present as satellite colonies around bacteria producing these compounds. NVS can cause bacteremia, infective endocarditis (IE) and invasive infections including abscesses, septic arthritis, osteomyelitis and meningitis. Chromosomal DNA-DNA hybridization in 1989 and 16S rRNA gene sequencing data in 1995 and 2000 led to reclassification of NVS into two genera as follows:

1. Abiotrophia (ABI)
  - a. Abiotrophia defectiva
2. Granulicatella (GRA)
  - a. Granulicatella adjacens,
  - b. Granulicatella elegans, and
  - c. Granulicatella balanopterae

Abiotrophia defectiva is a pleomorphic, nonsporulating, nonmotile, and facultative anaerobic organism that can appear as Gram-positive cocci, coccobacilli or bacilli. A recent rise in publications acknowledging case report of Abiotrophia species related infections have been noticed lately. Bacteremia and IE are the most frequent clinical infections worldwide with an incidence rate of 3-9 cases/100,000 in developed countries and 5-6 % of all cases of IE due to streptococcal species. Abiotrophia endocarditis is associated with a high rate of embolization, neurologic complications in 20-40% including subarachnoid hemorrhage and mycotic aneurysms and bacteriologic failure rate of 17-40% per literature.

A retrospective analysis revealed IE incidence rate due to NVS 1.5%, HACEK 0.88%, and streptococcus viridians group 16.62%. Among these subgroups, Peri-annular complications were more common in NVS group along with higher incidence of IE in IVDUs (p <0.001). Patel et al. compared the susceptibility profile of NVS to prior study and found significant difference. Penicillin sensitivity for Abiotrophia spp was 23.8% compare to 10.8% noticed by Alberti et al, ceftriaxone and vancomycin sensitivities were 100% in both studies. Granulicatella sp sensitivity for penicillin and ceftriaxone were 65.4% and 87.6% in Patel et al study compared to 38.9% and

43.3% in Alberti et al. NVS IE is treated like enterococcus IE with a beta-lactam antibiotic plus an aminoglycoside for 4-6 weeks (AHA and British society guidelines). Vancomycin for 4-6 weeks is alternate for penicillin allergic patients.

Abiotrophia defectiva is a rare yet important cause of culture negative endocarditis. Isolation of this pathogen is difficult to special laboratory needs, but modern technology has made ID process rapid and more accurate. Though not a classic IVD use related IE pathogen, Abiotrophia should be listed in the differentials.

## References

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2. Téllez A, Ambrosioni J, Llopis J, Pericàs JM, Falces C, Almela M, Garcia de la Mària C, Hernandez-Meneses M, Vidal B, Sandoval E, Quintana E, Fuster D, Tolosana JM, Marco F, Moreno A, Miro JM; Hospital Clínic Infective Endocarditis Investigators. Epidemiology, Clinical Features, and Outcome of Infective Endocarditis due to Abiotrophia Species and Granulicatella Species: Report of 76 Cases, 2000-2015. *Clin Infect Dis.* 2018 Jan 6;66(1):104-111.
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4. Gould FK, Denning DW, Elliott TS, et al. Guidelines for the diagnosis and antibiotic treatment of endocarditis in adults: a report of the Working Party of the British Society for Antimicrobial Chemotherapy. *J Antimicrob Chemother.* 2012;67(2):269–89.
5. Baddour LM, Wilson WR, Bayer AS, et al. Infective endocarditis in adults: diagnosis, antimicrobial therapy, and management of complications: a scientific statement for healthcare professionals from the American Heart Association. *Circulation.*

**Bug of the Quarter**  
By: W. Grant Starrett, M.D.

This article reviews the more obscure organisms which are less commonly isolated in clinical specimens. Please contact me at wgstarrett@premierhealth.com if you come across an isolate that may fit in this category.

**Organism:** *Cardiobacterium hominis*

**Clinical Data:**

A 67 year-old female with history of rheumatic heart disease and prosthetic valve endocarditis presented in outpatient referral from her primary care physician for MRSA from a chronic abdominal wound associated with an old gastrostomy tube site. Review of her chart revealed that she was diagnosed with bioprosthetic aortic valve endocarditis with severe aortic insufficiency in a local hospital two years prior to presentation. The patient had a remote history of mechanical mitral and bioprosthetic aortic valve replacements (AVR) associated with rheumatic heart disease and prior endocarditis. The blood isolate was initially thought to be a *Corynebacterium* species, but was later identified as *Cardiobacterium hominis*. Given the presence of multiple prosthetic valves with aortic homograft and pacemaker, she was transferred to the Cleveland Clinic, and eventually underwent a complex redo operation that included bioprosthetic AVR/aortic homograft replacement with Hemashield/aortic root reconstruction/tricuspid valve repair/pacemaker and endocardial lead explantation and pacemaker re-implantation. Her post-operative period was complicated by prolonged respiratory failure, ileus, left hand ischemia and hemoperitoneum with extension around the abdominal wall pacer pocket. A long course of ceftriaxone was administered, followed by amoxicillin. Her gastrostomy tube was eventually removed, and she had a persistent wound at this site. Evaluation for an occult abscess or gastro-cutaneous fistula was unremarkable, but she continued to have ongoing, mucoid drainage from a well-granulated wound. The drainage improved with discontinuation of hydrogen peroxide.

**Taxonomy:**

Kingdom: Bacteria  
Phylum: Proteobacteria  
Class: Gammaproteobacteria  
Order: Cardiobacteriales  
Family: Cardiobacteraceae  
Genus: *Cardiobacterium*  
Species: *hominis*

**Associated Diseases:**

1. Bacteremia/endocarditis

**Description:**

*Cardiobacterium hominis* is a pleomorphic Gram-negative bacillus that may be Gram-variable initially. Cells may appear swollen at one or both ends (tear-drop, dumbbell or lollipop shaped) and may be arranged in rosette-like clusters or “picket fence” chains. Comprising the “C” in “HACEK”, this organism is one cause of “culture-negative” endocarditis. It will grow in most

blood culture media but may go undetected and require a prolonged incubation period to identify. The lack of identification of *Cardiobacterium hominis* in respiratory or gastrointestinal samples is likely due to this trait, and clinical disease appears to be almost exclusively limited to bacteremia, endocarditis, and sequelae of bloodstream infections. Infection follows a very subacute course, and diagnosis may be delayed over six months due to its slow growing nature. Consequently, *Cardiobacterium hominis* tends to form large, friable vegetations which can lead to embolization and heart failure in a disproportionate number of cases. Susceptibility testing may be difficult because of the slow growth rate, but strains are susceptible to most antimicrobial agents, including various penicillins, cephalosporins and fluoroquinolones. Third generation cephalosporins have been recommended because of the occurrence of beta-lactamase-producing HACEK organisms: 3-4 weeks for native valve and 6 weeks for prosthetic valve endocarditis.

**Resources:**

1. Koneman's Color Atlas and Textbook of Diagnostic Microbiology, 6<sup>th</sup> ed.
2. Murray, *et al.* Manual of Clinical Microbiology, 7<sup>th</sup> edition.
3. Wormser GP, *et al.* *Cardiobacterium hominis*: Review of Microbiologic and Clinical Features. Reviews of Infectious Diseases. 1983 July; Vol 5 Issue 4:680-691.
4. Malani AN, *et al.* *Cardiobacterium hominis* endocarditis: two cases and a review of the literature. Eur J Clin Microbiol Infect Dis. 2006 Sep; 25(9):587-595.
5. Wilson WR, *et al.* Antibiotic treatment of adults with infective endocarditis due to streptococci, enterococci, staphylococci, and HACEK organisms. JAMA 1995;274:1706-1713.
6. [www.antimicrobe.org/b101.asp](http://www.antimicrobe.org/b101.asp)
7. [www.uniprot.org/taxonomy](http://www.uniprot.org/taxonomy)



## **New Antimicrobial Summary: Omadacycline (Nuzyra)**

By Dr. Katelyn Booher, D.O.

Omadacycline is a new tetracycline class antibiotic FDA approved October 2018, with anticipated availability early 2019. The antibiotic has been approved for community acquired bacterial pneumonia (CABP) and acute bacterial skin and soft tissue infections (ABSSI). Specifically, omadacycline has coverage against CABP pathogens including MSSA (but not MRSA), *S. pneumoniae*, *H. influenzae*, *H. parainfluenzae*, *K. pneumoniae*, *Legionella*, *Mycoplasma*, and *Chlamydia*. Regarding ABSSI, a major difference is added coverage of MRSA; other covered pathogens include: *S. lugdunensis*, *S. pyogenes*, *S. anginosus*, *E. faecalis*, *E. cloacae*, and *K. pneumoniae*. Intravenous and oral formulations are available, with a recommended duration for CABP and ABSSI of seven to ten days. The following dosing regimens are recommended:

- CABP: 200mg IV once, followed by 100mg IV once daily or 300mg orally once daily.
- ABSSI: 200mg IV once, followed by 100mg IV daily or 300mg orally daily.
- ABSSI (all oral dosing): 450mg orally on days 1 and 2, then 300mg orally once daily.

For optimal absorption, the medication must be taken after four hours of fasting with water, and with continued fasting two hours after dosing. The antibiotic binds the 30S ribosomal subunit blocking protein synthesis. Generally, it is considered bacteriostatic, but bactericidal activity has been observed with some isolates of *S. pneumoniae* and *H. influenzae*. Nausea and vomiting are the most common adverse effects, particularly with the oral loading dose option. Mortality imbalance of unclear meaning (2% mortality in the omadacycline versus 1% mortality in the moxifloxacin) was noted between omadacycline versus moxifloxacin groups in the treatment of pneumonia, and close clinical monitoring is advised. (*Summarized from Omadacycline Prescribing Information*)