Boonshoft School of Medicine
WRIGHT STATE UNIVERSITY

INFECTIOUS DISEASES NEWSLETTER

June 2018
Thomas Herchline, Editor

LOCAL NEWS

ID Fellows

Dr. Najmus Sahar will be at the VA Medical Center in June and July, and at Miami Valley Hospital in August. There will not be a first year fellow next year. Dr Alpa Desai will be joining South Dayton Acute Care Consultants in August and will be based at Soin Medical Center along with Miami Valley South. Dr Luke Onuorah will be starting his Infectious Diseases practice in Springfield, Ohio in August.

EMERGING INFECTIONS NETWORK

Resources for treatment of hospitalized patients with opioid use disorder

Dr. Hannah Snyder of UCSF shared resources for the treatment of hospitalized patients with opioid use disorder with EIN members. These resources were developed by UCSF and the California Health Care Foundation. Webinars, guidelines, and sample order sets can all be found at the SHOUT website: www.projectshout.org.

In the long term, methadone and buprenorphine have been shown to reduce bacterial infections, HIV, HCV, and mortality - an acute hospitalization is an opportunity to begin treatment. Prescribing methadone and buprenorphine in the inpatient setting is within the scope of infectious disease providers, and the SHOUT guidelines can help with developing local protocols. You may contact Dr. Snyder, the SHOUT Project Lead, at Hannah.snyder@ucsf.edu for further information.

NATIONAL NEWS
Contributed by Luke Onuorah, MD

New rapid Rabies test could improve testing and treatment

A new animal rapid rabies real time-polymerase chain reaction test called the LN34 test has been developed by the Centers for Disease Control and Prevention (CDC). An article published in PLOS One showed that in a pilot study the LN34 test produced no false negative, fewer false positive and fewer inconclusive tests when compared to the reference standard DFA test. The LN34 test can be used on animal tissue that is fresh, frozen, decomposed, or that has been fixed in blocks of paraffin to inactivate the virus. It is easier to use as it employs a platform that is already available in laboratories and does not require special training when compared to the DFA test. It could aid doctors and patients informed decisions on who needs treatment for rabies, which typically proves fatal once symptoms begin. In the United States if rabies tests are inconclusive the bitten person proceeds to receive post-exposure prophylaxis (PEP) with the receipt of rabies vaccine series which could cost an individual over $3000. Close to 40,000-50,000 people get rabies PEP in the United States annually. The total cost for rabies testing, prevention and control is estimated by experts to cost $245 to $510 million annually in the United States. Hence, the LN34 test has cost saving

potential. CDC is working with the Association of Public Health Laboratories to develop rabies testing guidance that will help clinicians and laboratory staff decide which tests to run in different scenarios and which tests can be used to confirm rabies, either singly or in combination with other tests.

E. coli O157:H1 outbreak

As of May 15, 2018, 172 people infected with the outbreak strain of *E. coli* O157:H7 have been reported from 32 states. Ill people range in age from 1 to 88 years, with a median age of 29. Sixty-five percent of ill people are female. Of 157 people with information available 75 (48%) have been hospitalized, including 20 people who developed hemolytic uremic syndrome, at type of kidney failure. One death was reported from California. Illness that occurred after April 21, 2018, might not yet be reported due to the time due to the time it takes between when a person becomes ill with E. coli and when the illness is reported. This takes an average of two to three weeks. According to the FDA, the last shipments of romaine lettuce from the Yuma growing region were harvested on April 16, 2018, and the harvest season is over. It is unlikely that any romaine lettuce from the Yuma growing region is still available in people's homes, stores, or restaurants due to its 21-day shelf life. The most recent illnesses reported to CDC started when romaine lettuce from the Yuma growing region was likely still available in stores, restaurants, and in peoples' homes.
This investigation is ongoing, and CDC will provide more information as it becomes available.
(Culled from https://www.cdc.gov/ecoli/2018/o157h7-04-18/index.html)

Tick, tick, tick

Arthropods such as mosquitoes, ticks and fleas are vectors for spreading diseases such as dengue, Zika, Lyme or plague. Between 2004 and 2016 more than 640,000 cases of vector-borne diseases were reported, and 9 new germs spread by bites from infected mosquitoes and tick were discovered or introduced in the US. State and local health departments and vector control organizations are the nation's main defense against this increasing threat. Yet, 84% of local vector control organizations lack at least 1 of 5 core vector control competencies. Better control of mosquitoes and ticks is needed to protect people from these costly and deadly diseases. In a new study published on May 24 in the Journal of Medical Entomology, researchers showed that permethrin-treated clothes could help repel ticks from attachment. Adult ticks on a pair of untreated regular paints tilted at a 45-degree angle will have 100% clinging on 5 minutes. It was found that 42.5% of ticks would tumble off entirely from permethrin-treated pants. Only 25 percent were moving normally when exposed to permethrin for 24 hours. Researchers do not know how long permethrin remains effective on treated clothes. As summers gets hotter and the range of arthropods are likely to increase, every method to control disease transmission are needed.

INTERNATIONAL NEWS

Contributed by Najmus Sahar, MD

Malaria in South Africa

As of April 2018, CDC reported cases of malaria in UK residents who had returned from the Waterberg district municipality of Limpopo Province in South Africa. Waterberg had not previously been considered an area with malaria; however, local cases have been reported in the past. Malaria is known to be a risk in other areas of Limpopo Province, including Vhembe and Mopani district municipalities. Other known malaria risk areas in South Africa include Ehlanzeni district municipality in Mpumalanga Province, Umknanyakude in KwaZulu-Natal Province, and Kruger National Park. Public health authorities are responding to this outbreak by enhancing malaria surveillance, making sure that patients are diagnosed and treated promptly, and educating the community and health care workers on malaria.

Yellow Fever in Brazil

As of May 2018, there is a large, ongoing outbreak of yellow fever in multiple states of Brazil since 2017. Travelers to Brazil should protect themselves from yellow fever by getting yellow fever vaccine at least 10 days before travel, and preventing mosquito bites. People who have never been vaccinated should avoid traveling to areas of Brazil where yellow fever vaccination is recommended.

Nepal: first country in South-East Asia validated for eliminating trachoma

21 May 2018 | Kathmandu | New Delhi | Geneva -- The World Health Organization (WHO) has validated Nepal for having eliminated trachoma as a public health problem – a milestone, as the country becomes the first in WHO's South-East Asia Region to defeat the world's leading infectious cause of blindness.

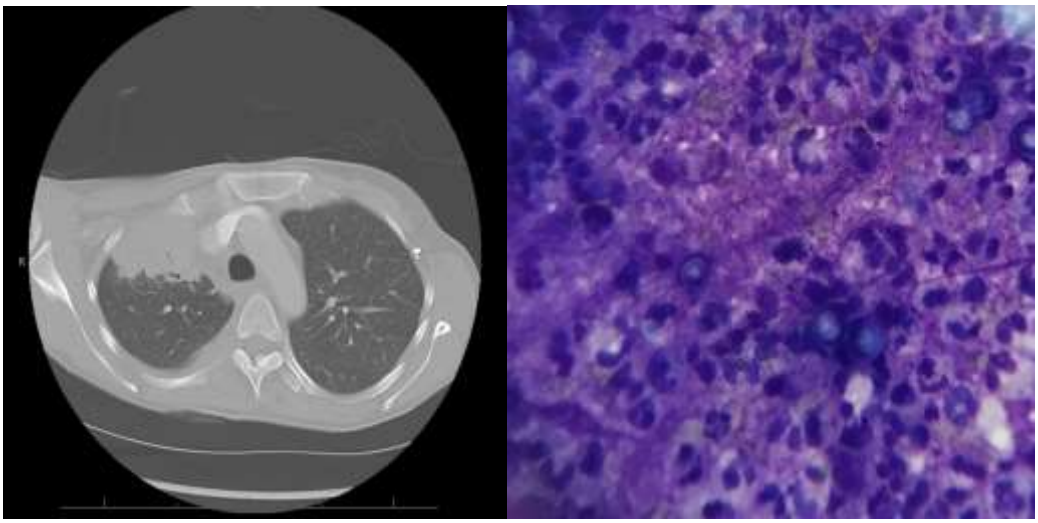
Seventy-First World Health Assembly update

With wild poliovirus transmission levels lower than ever before, and the world closer than ever to being polio-free, discussions focused on securing a lasting polio-free world. As at May 2018, only 9 cases due to wild poliovirus had been reported globally, from just 2 countries: Afghanistan and Pakistan. Delegates reviewed emergency plans to interrupt the last remaining strains of the virus.

CASE CONFERENCE

Contributed by Alpa Desai, MD

A 38-year-old female with h/o chronic hepatitis C and tobacco abuse presented to ED with complain of right upper chest pain extending to her side and thoracic back for last 4-5 days which has been progressively getting worse. Patient also endorsed subjective intermittent low-grade fever and night sweat for about one month. She reported dyspnea on exertion for few weeks but denied cough or sputum or hemoptysis. She reported recent 10 pounds weight loss. She was afebrile with mild tachycardia and on room air with O2 saturation of 98%. Physical examination showed oral thrush; papule with scab on anterior chin, and tenderness to palpation was noted over thoracic spine and right para spinal muscle. Laboratory work up was remarkable for hemoglobin of 8.6. CT chest showed 5 cm apical pan coast tumor and right paraspinal soft tissue mass. MRI thoracic spine showed bone lesion at T12 suspicious for metastatic focus and destructive lesion involving the medial right forth rib, right T4 transverse process and pedicle with soft tissue component extending to the posterior paraspinal musculature and an extra pleural space indenting the pleura. MRI brain showed puncture area of abnormal signal on the left parietal lobe potentially relating to a metastatic focus. Patient received lumber puncture with normal CSF analysis. She was admitted with a concern for possible lung malignancy with questionable metastatic lesion to T12 vertebra. Patient underwent CT guided biopsy of lung and para spinal mass. Blood and CSF cultures were negative. HIV test was non-reactive. Histopathology stain of tissue showed broad based budding yeast. Patient was diagnosed with disseminated Blastomycosis. Serum Blastomyces Ag was positive. CSF Blastomyces Ag was negative. Cytology was tissue was negative for malignant cells. She was given voriconazole for about 4-6 weeks and antifungal treatment was later switched to itraconazole. Her repeat CT chest and MRI thoracic spine after 3 months of treatment showed significant improvement.



Discussion

Blastomyces lives in the environment, particularly in moist soil and in decomposing organic matter such as wood and leaves. In the United States, the fungus mainly lives in the midwestern, south central, and southeastern states, particularly in areas surrounding the Ohio and Mississippi River valleys, the Great Lakes, and the Saint Lawrence River [1]. Pulmonary blastomycosis (lungs/pleura) is most common infection related to Blastomyces. Skin and bone is the most common extra pulmonary site for blastomycosis infection followed by lymph nodes, CNS (brain and spinal cord) [2]. Independent risk factors for development of blastomycosis included immunosuppression for any reason (including drugs or disease), collagen vascular disease, being an outdoor worker, and having a coworker with blastomycosis [2]. Osseous blastomycosis is a well-known but infrequent complication of infection. The most common bone involvement with

blastomycosis includes long bones followed by axial skeletal [3]. Osseous osteomyelitis due to blastomycosis may be asymptomatic, manifesting only as a lytic lesion on radiograph or an area of increased uptake on bone scan [4]. Clinical presentation is usually subacute or chronic ranged from 1 month to 24 months. Clinical picture of vertebral blastomycosis include constitutional symptoms, manifestation of infection at other body sites, the local effects of bone destruction and formation of contiguous abscess (para spinal or psoas abscess)[4]. The lower thoracic and lumber regions of the spine are the most commonly affected. Vertebral blastomycosis is commonly associated with pulmonary involvement. Blastomycosis osteomyelitis should be considered in the differential diagnosis of bone tumor, particularly when there is history of residence or travel in endemic areas [3.] Amphotericin B remains the initial drug of choice for patients with blastomycosis who are severely ill, have life-threating disease or have CNS involvement. Now, with the availability of less toxic oral azoles, it has become standard practice to switch from amphotericin B to an azole after initial improvement or in less ill patients without CNS disease. In studies in vitro activity of voriconazole was compared to Itraconazole and Amphotericin B against the mold form of blastomyces which showed that the fungistatic effect of voriconazole is similar to or better than, that of itraconazole for blastomyces isolates and both of these triazole agents are fungicidal in vitro for some isolates of *B. dermatitidis* [5]. Generally, it is not necessary to surgically debride blastomycosis bone lesions. However, drainage of contiguous abscesses, especially if they are large, is probably useful [4].

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New Antimicrobial Summary: Bezlotoxumab (Zinplava)

By Dr. Katelyn Booher, D.O.

In the face of the recurrent nature of *Clostridium difficile* infection (CDI), enter the first agent for CDI prevention: bezlotoxumab. A single infusion (10mg/kg) administered while the patient is still receiving standard of care antibiotics for CDI, this minimally immunogenic human monoclonal antibody functions by binding *C. difficile* toxin B. Specifically, the indication is for those adult patients at high risk recurrent CDI (rCDI) (1,2).

Bezlotoxumab neutralizes the activity of toxin B from various genetically diverse strains of C. difficile. The monoclonal antibody itself is generally well-tolerated; the adverse effect rate was similar to placebo as evidenced by MODIFY I and II trials discussed below. However, there was an increase incidence in heart failure observed in those with baseline heart failure. Dosing is not adjusted based on renal or hepatic function, and drug interactions are not of concern (1,2).

MODIFY I and II, large double-blind, randomized, phase 3, placebo-controlled trials involving 2655 adults with primary or recurrent CDI, demonstrated the benefits of bezlotoxumab. Bezlotoxumab demonstrated substantial benefits in reduction of C. difficile recurrence rates in comparison to actoxumab (a monoclonal antibody to toxin A) alone, actoxumab plus bezlotoxumab, and placebo (1). Specifically, bezlotoxumab was associated with a rate of rCDI that was 38% lower than standard of care treatment alone; the effect was sustained over 12 weeks (1). It seems that toxin B is the main determinant of virulence in rCDI.

Attention to risk factors for rCDI to determine appropriateness for bezlotoxumab infusion is important. These risk factors include: age 65 or greater, history of CDI, compromised immunity, severe CDI, and ribotype 027/078/244. In a post hoc analysis of MODIFY I/II data, patients with three or more risk factors saw the greatest benefit, but those with 1 or 2 risk factors may benefit as well (3).

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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: *Helicobacter fennelliae*

Clinical Data:

A 37 year-old male with a four-year history of AIDS and peptic ulcer disease presented with chest pain, cough and fever and was admitted. He was ultimately diagnosed with Group A streptococcal bacteremia possibly associated with endocarditis and was discharged on a four-week course of ceftriaxone.

A review of his chart revealed that he had a history of *Helicobacter fennelliae* bacteremia about one year following his HIV diagnosis. Outpatient blood cultures had been obtained in his HIV clinic for low grade fever without symptoms, and he admitted to poor compliance with his HIV regimen and prophylactic medication. His most recent CD4 count at the time was 13. Four days after the clinic visit a possible *campylobacter* species was reported to have been isolated, and he was eventually instructed to go to the emergency room. He reported intermittent fevers and was admitted from the emergency room 13 days after the original culture had been obtained. He denied any localizing symptoms and his infectious disease consultant placed him on levofloxacin for a presumed *Campylobacter* bacteremia, which had still not been confirmed due to difficulty with growth in the laboratory. He was discharged on oral levofloxacin and his fevers had resolved upon follow-up.

Taxonomy

Kingdom: Bacteria
Phylum: Proteobacteria
Class: Epsilonproteobacteria
Order: Campylobacterales
Family: Helicobacteraceae
Genus: *Helicobacter*
Species: *fennelliae*

Associated Diseases:

1. Proctocolitis
2. Bacteremia/sepsis
3. Gastroenteritis

Description:

Helicobacter species are composed primarily of spiral or curved bacteria that inhabit the gastrointestinal tract of humans and other mammals. This genus is most well-known for *H. pylori*, which is associated with peptic ulcer disease and some cancers of the gastrointestinal tract.

Helicobacter fennelliae was originally described in the mid 1980's (called *Campylobacter fennelliae* at the time) after being isolated in relatively high incidence from the rectal secretions of homosexual men, both symptomatic and asymptomatic. This organism is similar to, but distinguishable from, other species in the genus *Campylobacter,* a fact that probably explains the delay in identification of the isolate in our case. Bacteremia, proctocolitis and enteritis with this organism have since been described, primarily in patients infected with the human immunodeficiency virus (HIV). Few cases have been reported in patients without HIV, and these patients are generally immunocompromised for other reasons, such as hepatic cirrhosis and

diabetes mellitus. A wide variety of antimicrobial agents appear to be effective for treatment of infection with *Helicobacter fennelliae.*

Resources:

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