ID Fellows

Dr Luke Onuorah will be at Miami Valley Hospital in August and September, and at the VA Medical Center in October. Dr Alpha Desai will be at the VA Medical Center in August and September, and at Miami Valley Hospital in October.

Welcome to Dr David Lindholm! He is an ID physician newly assigned to Wright Patterson AFB. Also, Dr Shruti Patel will be remaining in the Dayton area, and will be based at Grandview and Sycamore Hospitals.

Local Disease Activity

Gastrointestinal illness (GI) was increased, as often happens in the warmer months. There were seven cases of Campylobacter reported in June, 18 cases of Shigella, 3 cases of Salmonella, and one case of Cryptosporidium. The majority of cases were in children; the age ranges were 2 months to 66 years among the reported Campylobacter cases, and 18 months to 73 years among the Shigella cases. There was a cluster of Shigella cases involving a daycare center which included ten children who attended the daycare and one older sibling. There were five cases of Campylobacter reported in July, 5 cases of Shigella, 3 cases of Salmonella, 3 cases of Giardia, and one case of E coli. The majority of cases were in adults (11 cases); the age ranges were 2 years to 65 years among the reported Campylobacter cases, and 4 months to 55 years among the Shigella cases.

There were 4 cases of Lyme Disease reported during July. Three of these individuals developed symptoms after travel to a Lyme endemic area. The other individual was diagnosed with Lyme based on a macular rash, history of tick exposure, and positive IgM Western Blot (which is non-specific).

NATIONAL NEWS
Contributed by Luke Onuorah, MD

Multistate outbreaks of Salmonella

As of July 14, 2016, a total of 611 persons infected with outbreak strains of Salmonella have been reported from 45 states since January 4, 2016. Thirty-two percent of ill people were children 5 years and younger. 138 ill people were hospitalized and one death was reported. Salmonella infection was not considered to be a cause of death.
Zika in the USA

Zika virus was first detected in the US territory of Puerto Rico in November 2015, and as of July 7, 2016 32% of 16,522 patients suspected to have Zika virus have shown laboratory evidence of current or recent infection. The infection has arrived on the mainland; in Florida as of August 8, 2016 there has been 17 cases of non-travel related infections reported, with six of these meeting CDC’s case definition. Fifty-five cases involving pregnant women have also been reported as of that date. Zika virus spreads to people primarily through the bite of an infected Aedes species mosquito (Ae. aegypti and Ae. albopictus), but can also be spread during sex by a person infected with Zika to sex partners.

Multistate outbreak of Shiga toxin-producing Escherichia coli

As of July 25, 2016, 46 people infected with the outbreak strains of STEC O121 (45 people) or STEC O26 (1 person) have been reported from 21 states. Ohio is not one of these states. Ill people range in age from 1 year to 95, with a median age of 18. Thirteen ill people have been hospitalized. One person developed hemolytic uremic syndrome. No deaths have been reported. Epidemiologic, laboratory and traceback investigations have led to the flour produced at the General Mills factory in Kansas City, Missouri as the likely source of this outbreak. This has led to the recall of its package flour products.

INTERNATIONAL NEWS

Ebola Vaccine

Merck announced that its investigational Ebola vaccine, V920, was granted breakthrough therapy designation by the FDA. V920 targets the Zaire ebolavirus species, which was responsible for the 2014 Ebola outbreak in West Africa. The live-attenuated vaccine was initially
engineered by scientists at the Public Health Agency of Canada’s National Microbiology Laboratory. According to the FDA, a breakthrough therapy is drug that is “intended alone or in combination with one or more other drugs to treat a serious or life-threatening disease or condition” and one in which “preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints.” Under the designation, the FDA will expedite the development and review of V920.
Case Conference
Contributed by Shruti Patel, MD

50 year old female with history of renal transplant two years ago due to lupus nephropathy came with complaints of nausea, vomiting and diarrhea for seven days. She had dental filling procedure done six days ago and started having dry cough and left sided chest pain after a day. She started having fever up to 103 degree at home two days ago. She endorsed weight loss, night sweat and increase in urinary frequency for last ten days. Her past medical history was significant for multiple deep venous thrombosis and IVC filter, strokes and C. diff one year ago. She had allergy to penicillin. She was taking Cyclosporine, Mycophenolate, Prednisone, Coumadin and Bactrim at home. Her blood pressure was 119/59 mm of Hg. Her temperature was 101.3 F. She was breathing at RA with O2 saturation of 96%. Her physical exam was significant for poor dentition and several missing teeth. Her respiratory exam was without any distress with overall reduced air entry. She had chronic lymphedema on her right upper arm and right breast. Her white blood cell counts was 15700. Her creatinine was 3.2. Her Procalcitonin was 0.69. Chest xray on admission showed a large mass or consolidation in the left upper lobe. CT scan was done to further evaluate it and showed 4.5 cm mass on left upper lobe with multiple shotty lymph nodes in mediastinum suspicious for malignancy. Because of this she underwent PET scan which showed markedly increased activity with SUV index of 21.4 consistent with primary malignancy. She had detectable CMV Viral load. Because of her immunosuppressive status and multiple clinical issues she was transferred to OSU where her original transplant was done. At time of her discharge, her sputum gram stain was positive for gram positive beaded branching rods. AFB stain was done later on and was partially acid fast positive suggestive of Nocardia spp. At OSU she underwent bronchoscopy guided upper lobe mass biopsy. Pathology of the biopsy showed necrotizing granuloma without any malignancy. Sputum culture at our hospital eventually grew No cardia Otitidiscaviarum. She was started on Bactrim 15 mg/kg/day and developed severe hyperkalemia while still at OSU. She was then discharged on 10mg /kg/day to home to treat left upper lobe Nocardia Pneumonia. After two weeks patient found to have severe hyperkalemia with K of 7.2. Bactrim was discontinued and she was started on Linezolid.

Discussion

PET scans are effective way to diagnose malignancy. It is positive in several inflammatory conditions but SUV index are usually very helpful in differentiating these infections or inflammatory conditions from malignancy (which has a higher SUV index suggestive high metabolic activity). There are certain infections which can mimic malignancy on PET scans. There are several case reports mentioning Nocardia infection imitating malignancy on PET scans. Other infections like Tuberculosis, Aspergillosis, Histoplasmosis, Cryptococcosis are reported in literature which had positive PET scans concerning for malignancy. Most of the reported cases in literature about Nocardia infection with positive PET scans had SUV index between 7 to 16. Our patient' SUV index was extremely high. Treatment of choice for Nocardiosis is Bactrim. Patient who has sulfa allergy or unable to tolerate Bactrim, Linezolid is also a good option.

References

Antibiotic Resistance
Contributed by: PJ Greene (Univ of Dayton Premed Student)

With the rapid emergence of antibiotic resistant bacteria occurring worldwide, the once miracle work of antibiotics is now being threatened. Much to the knowledge of healthcare providers, the antibiotic resistance crisis is attributed to the ill use and overuse of these medications and the lack of new drug advances. Today, with resistance being seen to nearly every antibiotic and the challenging FDA regulation requirements to develop new drugs, antibiotic resistance is a global threat.

According to the CDC antibiotic resistance is a “problem today and a crisis tomorrow”. Facts reported by the CDC in 2013 state that in India 58,000+ babies died in one year from super-resistant bacterial infections. In the European Union, antibiotic resistance causes 25,000 deaths per year and 2.5 million extra hospital days. In Thailand, antibiotic resistance causes 38,000+ deaths per year. Lastly, in the United States antibiotic resistance causes 23,000+ deaths per year and more than 2 million illnesses. With the already high rate of antibiotic resistance, such a high frequency of antibiotic prescriptions, and the recent discovery of “superbugs” antibiotic resistance is a major issue confronting the healthcare system.

Antibiotic prescribing practices and guidelines vary widely and errors are common. Specifically, in the United States there are no strict set of guidelines in place stating when to prescribe antibiotics. This results in the overuse of antibiotics and causes the rate and dosage of prescription antibiotics to vary. According to the CDC’s annual report, within the United States there is no consistency in the number of antibiotic prescriptions observed from state to state. Inappropriate prescribing also contributes to the ever growing issue. In the United States the CDC estimates that approximately 50% of antibiotic prescriptions written in the outpatient setting may be inappropriate. Extensive use of antibiotics in the agricultural setting aids resistant bacteria to be transferred from animals to humans. According to an article by Daeseleirre, et al, 80% of antibiotics sold in the United States are used in animals. Resistant bacteria that develop in livestock are then ingested and introduced into humans when they consume food, leading to the further spread of resistant bacteria and adverse health consequences. This, coupled with the inability to track antibiotic resistance both locally and globally, begs the question of whether or not antibiotic resistance is an issue that can ever be solved.

Although antibiotic resistance will most likely always exist, other than decreasing the amount of antibiotic prescriptions, there are ways to slow global resistance. Many options exist including, but not limited to:

1) Improving laboratory capacity around the world so countries can use labs to identify bacteria and choose the right drugs to treat specific infections backed by scientific data.
2) Developing national tracking programs so that countries can collect resistance data and report their findings. Using this information to target and measure prevention efforts and help share policies that stop the spread of resistant bacteria.
3) Implementing even more Antibiotic Stewardship Programs in order to keep a close eye on when antibiotics are prescribed and how/when they are taken.
4) Expanding infection control practices in healthcare settings to ensure that antibiotic-resistant germs are not spread.
5) Improving both local and global guidelines on when to prescribe certain antibiotics.

In conclusion, with the rapid emergence of antibiotic resistant bacteria the health benefits that can be attained by antibiotics are in danger. Antibiotic resistance is a global crisis and everyone, including healthcare providers and patients, need to take the necessary steps to combat the rising issue. With the growing global concern of antibiotic resistance it is crucial that we no longer take the availability of effective
antibiotics for granted. A substantial health burden is placed on the global health care system due to these resistant bacteria’s and efforts need to be made to try and manage this predicament.

References:

Upcoming Events

August 2016
10   Journal Club
31   Case Conference

September 2016
14   Journal Club
28   Case Conference

October 2016
12   Journal Club
26-30 ID Week
http://www.idweek.org
26   Case Conference

November 2016
9    Journal Club
     Case Conference cancelled

December 2016
14   Journal Club
     Case Conference cancelled

January 2017
11   Journal Club
25   Case Conference

February 2017
8    Journal Club
13-16 Conference on Retroviruses and Opportunistic Infections
http://www.croiconference.org/
22   Case Conference

March 2017
8    Journal Club
29   Case Conference
29-31 Society for Healthcare Epidemiology
http://sheaspring.org

April 2017
22-25 European Congress of Clin Micro & Inf Dis
http://www.eccmid.org

June 2017
16-18 Refugee Health Conference
http://www.northamericanrefugeehealth.com/
16-20 ASM Microbe (ASM/ICAAC)
http://asmmicrobe.org