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Podcast Contributor Show Notes

Coronavirus Outbreak

Summary: In this Hippo Education Short, Infectious Diseases specialist Dr. Devang Patel sits down with our own Dr. Neda Frayha to discuss what we know so far about the new 2019-n-CoV coronavirus outbreak and what front-line clinicians can do if we suspect a patient of ours might have this viral illness.

References:

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Resource:

Centers for Disease Control and Prevention 2019-n-CoV PUI Case Investigation Form: https://www.cdc.gov/coronavirus/2019-ncov/downloads/pui-form.pdfpdf icon

Basic info on this virus? (what's been in the news)
2019-n-CoV
Outbreak first declared on 12/31/19
Wuhan city in central SE China
First case detected in the U.S. on 1/21/20 in Washington state, now more cases in CA, AZ, IL
Stats so far: ~6000 cases, 130 deaths, 5 confirmed cases in the US as of 1/27/20
Passengers being screened on entry at several US airports: JFK, LAX, SFO, Atlanta, O'Hare

What don't we know yet?
How infectious or transmissible this is
Mortality rate
How many people who are infected may be asymptomatic (super spreaders)

What do we know about the coronavirus family in general?
Medium sized RNA virus
4 of the strains can cause the common cold
Often in animals - birds and mammals, like bats
Other recent examples of coronaviruses that infected humans = SARS and MERS

What seemed to be the initial nidus of virus spread in Wuhan?
Animal and seafood market
Specifically from a bat
27 of initial 41 cases had exposure to this market
But some infected people hadn't been exposed to that market at all

How is the virus transmitted from one person to another?
Respiratory droplets only?

Incubation period? Not clear but all guidance is using 14 days which is I think to make sure we don't go short on our window.
One analysis of a familial cluster hints at 3-6 days -- echoing the above

When is an infected person contagious? Before symptoms start?

Populations at risk? I.e., very young/very old, underlying chronic illness, etc.
In a study by Huang et al in Lancet published on 1/24/20, of the 41 initial people who became sick in Wuhan, the median age was 49. Thirteen patients of the 41 had underlying chronic illness. FWIW, the critically ill among this initial cohort had high levels of cytokines in their blood - "cytokine storm."

Practically speaking, it will be hard for most of us to tell these patients apart from patients with influenza, especially at this time of year. How can we differentiate one from the other? We can't

outside of having an epi history that supports looking for 2019-n-CoV. We can discuss why a proper history is important.

What can we do if we suspect we may be seeing a patient with 2019-n-CoV?

Fever and myalgias seem to precede the respiratory symptoms (dyspnea in particular)
FIRST, determine if the patient meets PUI criteria.
From the CDC: “Patients in the United States who meet the following criteria should be evaluated as a PUI [patient under investigation] in association with the outbreak of 2019-nCoV.”

Clinical Features	&	Epidemiologic Risk
Fever[1] **and** symptoms of lower respiratory illness (e.g., cough, difficulty breathing)	and	In the last 14 days before symptom onset, a history of travel from Wuhan City, China. *– or –* In the last 14 days before symptom onset, close contact[2] with a person who is under investigation for 2019-nCoV while that person was ill.
Fever[1] **or** symptoms of lower respiratory illness (e.g., cough, difficulty breathing)	and	In the last 14 days, close contact[2] with an ill laboratory-confirmed 2019-nCoV patient.

SECOND: Immediately notify the following groups:

- Infection control personnel at their healthcare facility
- Local or state health department

What happens from there in terms of reporting?

State health departments that have identified a PUI should immediately contact CDC’s Emergency Operations Center (EOC) at 770-488-7100 and complete a 2019-nCoV PUI case investigation form.

CDC’s EOC will assist local/state health departments to collect, store, and ship specimens appropriately to CDC, including during after hours or on weekends/holidays. At this time, diagnostic testing for 2019-nCoV can be conducted only at CDC.

Back to us. What else do we do?

Infection control measures: try to maintain standard + contact + airborne precautions + eye protection when evaluating these patients

Testing?

Right now only the CDC is able to do reverse transcription (RT) PCR testing for this virus, but this could change very soon - they're saying they'll publish information in the coming days to weeks so partner labs can also do diagnostic testing.

CDC also working on lots of other things like viral genome sequencing & growing the virus in cell culture

One colleague asked if the standard respiratory viral panels many of us have in our hospitals will detect 2019-n-CoV - so I guess not? NO! We can elaborate on this

CDC is saying NOT to try to isolate this virus ourselves in culture

"CDC recommends collecting and testing multiple clinical specimens from different sites, including all three specimen types—lower respiratory, upper respiratory, and serum specimens. Additional specimen types (e.g., stool, urine) may be collected and stored. Specimens should be collected as soon as possible once a PUI is identified regardless of time of symptom onset."

Any complications we should look out for, other than respiratory failure?
Among the initial 41 who have been studied, most common complications were ARDS (29%), acute cardiac injury (12%), secondary infection (10%).

Treatment other than supportive care?
Quarantine? (and what does this mean, practically speaking)
Any trials of antivirals? One hospital in Wuhan has begun a clinical trial of antivirals (lopinavir and ritonavir); the initial cohort of patients who were hospitalized did receive broad spectrum abx, antivirals, even corticosteroids in some, but hard to know the impact of any of these based on what we have so far and so far none of these are recommended as standard of care.
Chloroquine? Some evidence for SARS that it inhibited growth

What have we learned from past outbreaks like SARS and MERS?
See table below from NPR article.
Some similarities in presentation: fever, cough, dyspnea, ground glass opacities on CT
Some differences: SARS and MERS had more URT involvement whereas 2019-n-CoV seems to be more LRT
SARS and MERS had more diarrhea among their presenting symptoms; so far not for n-CoV

	Wuhan coronavirus (2019-nCoV)	Middle East respiratory syndrome (MERS)	Severe acute respiratory syndrome (SARS)	Common cold caused by coronavirus
Origin	First reported in December 2019 in Wuhan, China.	First reported in 2012 in Saudi Arabia.	First reported in 2002 in southern China.	Four coronavirus strains are thought to be responsible for 15-30% of common colds.
Transmission	Likely from touching or eating an infected, as yet unidentified animal. Human-to-human transmission occurs through close contact.	Often from touching infected camels or consuming their milk or meat. Limited transmission between humans through close contact.	Believed to have spread from bats, which infected civets.Transmitted mainly between humans through close contact.	Close contact with infected humans or touching a surface that carries the virus.
Cases	Around 500 confirmed; 17 deaths as of Jan. 22. Some victims were older males with preexisting conditions.	2,494 confirmed cases; 858 deaths (as of Nov. 30, 2019). Mortality rate of 34%.	8,098 cases; 774 deaths. Mortality rate of about 10%.	Millions each year. Generally nonlethal with rare exceptions.
Current status	Cases reported mainly in Wuhan, as well as other parts of China and Asia. One case reported in U.S.	All cases linked to Arabian Peninsula, with 80% in Saudi Arabia. Others in about two dozen countries, including U.S. Cases and deaths have been declining since 2016.	No new cases reported since 2004. 87% of previous cases in China and Hong Kong.	Circulates year-round, but more common in fall/winter.

Notes

Cases as of Jan. 22.

Source: World Health Organization, U.S. Centers for Disease Control and Prevention, and Wuhan Municipal Health Commission

Credit: Daniel Wood/NPR

Contrast between panic over this new virus and complacency around flu/reluctance to be vaccinated against flu.

So far this winter 120,000 hospitalizations and 6600 deaths from the flu in the U.S.

In a bad year, flu kills up to 61,000 Americans / 650,000 globally

Helpful resources?

CDC has lots of detailed information, including preparedness checklists for health care professionals and hospitals