Medical Experts Are Worried About the New SARS Pneumonia

By February 2003, more than 300 people in Guangdong Province, China, had been ill with severe respiratory distress. The World Health Organization (W.H.O.) is analyzing the medical data
to determine if this is where the worldwide Severe Acute Respiratory Syndrome known as "SARS," originated.

Earthfiles, news category.

March 21, 2003 - SARS is an acronym for Severe Acute Respiratory Syndrome, an atypical pneumonia that rapidly attacks alveoli lung tissue. This afternoon, Julie Gerberding, M. D., Director, Centers for Disease Control in Atlanta announced that:

> "Some of the individuals with the severe SARS pneumonia and death have been relatively healthy, middle-aged people, and that tells us that this is a disease that can be virulent and life-threatening, even among those who are otherwise probably immunologically healthy. ...Further, the high attack rate in health care workers caring for the early hospitalized patients ... suggests that it is certainly contagious."

- CDC is now monitoring 22 cases of the SARS pneumonia in the United States.

California 6
Hawaii 3
Maine 1
Massachusetts 1
New Jersey 1
New Mexico 1
North Carolina 2
New York 2
Rhode Island 1
Utah 1
Virginia 2
Wisconsin 1

Total Suspected U. S. Cases Under Investigation: 22

- The mystery illness that attacks lung tissue has now been reported in 14 countries.

- The number of people infected with SARS depends on whether 305 cases in Guangdong Province, China, last month are included. The World Health Organization thinks Guangdong should be included; so far, the CDC has not. Thus, the total ranges between 337 and 654.

- Officially, 10 SARS victims have died, but the number is changing daily.

- In the last 24 hours, CDC has issued 35,000 health alerts to travelers arriving in the United States.

- CDC has begun meeting airliner and cruise ships to talk with ill passengers and isolate them in hospitals if SARS symptoms are evident.

Airport traveler in China wearing mask because of SARS scare.

What are SARS symptoms?

According to the World Health Organization and the Centers for Disease Control in Atlanta,

"Most patients identified have been previously healthy adults aged 25 to 70," plus a few children, who suddenly have a:

1) Fever of 100.4 degrees Fahrenheit or higher.
2) Headache.
3) Dry cough.
4) Trouble breathing.
5) And either traveled to Southeast Asia, or are in contact with someone who did.

Any treatments helping?

- Antibiotics don't work.
- Anti-viral medicines might help.
- But no treatment is known.
- In 10-20% of the cases, patients are so sick they have been put on ventilators to get oxygen. That need for so many ventilators surprised David Heymann, M. D., and Executive Director of Communicable Diseases for the World Health Organization. I talked with him by phone this week in his Geneva, Switzerland office.

Interviews:

David Heymann, M. D., Executive Director, Communicable Diseases, World Health Organization, Geneva, Switzerland: "We do know that people get very seriously ill and we also know that if hospitals have the appropriate equipment, which they now have in Vietnam and they have had in Hong Kong, lives can be saved if patients are put on ventilators. But this is very unusual for an epidemic of this type of an atypical pneumonia to require respirators in many

instances. It's very unusual.

IS IT TRUE THAT NONE OF THE TYPICAL ANTIBIOTICS ARE WORKING AGAINST THE SARS DISEASE?

It appears that is the case that normal antibiotics are not working, and anti-virals are being tried and it's not clear if they have had any impact either.

THAT'S WHY EVERYBODY IS BEING TOLD ON TELEVISION AND RADIO IF YOU HAVE ANY OF THESE SYMPTOMS, PLEASE GO TO AN EMERGENCY ROOM OR A HOSPITAL?

As far as we understand, that's exactly the reason, yes. We're in a state of alert looking for possible suspect cases. Then of containment, isolation and containment, and working together internationally throughout the world through our laboratories to diagnose or find out what is causing this outbreak.

AND EVEN IF ANTIBIOTICS ARE NOT WORKING, MOST OF THE LARGER CITIES AND HOSPITALS HAVE RESPIRATORS THAT HAVE PROVEN TO BE VERY HELPFUL?

That's correct. Hospital supportive treatment, including respirators if necessary, is the best possible treatment.

COULD THIS OUTBREAK, COMING AT EXACTLY THIS PERIOD OF FEBRUARY TO MARCH, BE ONE OF SADDAM HUSSEIN'S OR AL QAEDA'S EXPERIMENTS WITH BIOLOGICAL WEAPONS?

We have no evidence that this is a deliberately caused epidemic. Once we find the organism, we'll be able better to determine where this outbreak might have come from; in other words, how it became established. But at present, there is no evidence this is a deliberately caused outbreak or bioterrorism."

If microbiologists could identify the pathogen, then tests for the disease - and possibly a vaccine could be developed. But so far the culprit's definite identity has not been proved. But electron microscope research is narrowing in on a family of viruses known as *Paramyxo*. Professor John Tam in the Department of Microbiology at China University, reported this week that he had found *Paramyxo* virus in both blood and tissue of a SARS patient.

There are hundreds of *Paramyxo* viruses with varying degrees of danger for both animals and humans. The same *Paramyxo* virus that causes measles in people, causes deadly distemper in dogs. Other examples of Paramyxo human diseases are mumps and croup in children.

I asked CDC's Chief of Respiratory and Enteric Viruses, Dr. Larry Anderson, about SARS being a *Paramyxo* virus that might spread through the air like measles.

Is SARS Transmission Airborne?

Larry Anderson, M. D., Chief, Respiratory and Enteric Viruses Branch, Centers for Disease Control, Atlanta, Georgia: "That's certainly possible. Some of the *Paramyxo* viruses of course, measles is very efficient in transmitting. But I don't think it's going to be that's more of the small particle airborne transmission. But the other *Paramyxo* viruses, respiratory S. virus, Parainfluenza virus and the human metanuma virus recently discovered, are pretty efficient transmitters. What this means, we don't know, but that is certainly one of the possibilities, that it would spread more widely. We don't know yet.

There are two laboratories that have identified one in Germany and then Dr. Tam's lab in Hong Kong that have identified by electron microscopy and specimens particles that are consistent with the Paramyxo virus particle. And it's reported in one of the Hong Kong newspapers that Dr. Tam has also identified

genetic material suggestive of a *Paramyxo* virus. I think that is a very encouraging finding and I think as in discussions with W. H. O. and Dr. Tam and others, it's an encouraging finding, but we're not at least not in last discussions we've had it's not yet been demonstrated for certain that it's the cause of the outbreak.

I TALKED WITH DR. GLEAZEN WHO IS PROFESSOR OF VIROLOGY AND MICROBIOLOGY TODAY?

Yes.

HE SAID THAT HE DID NOT UNDERSTAND CDC'S PARTICULAR FOCUS ON JUST THE CLOSE CONTACT OF FLUIDS WHEN IT SEEMED FROM WHAT HE WAS READING THAT THERE WERE CLEAR INDICATIONS THAT PEOPLE IN THE HOTEL, FOR EXAMPLE, SOMEBODY IN A HOTEL WHERE THERE WERE MORE THAN HALF A DOZEN PEOPLE CAME DOWN WITH THE SAME SYNDROME THAT IT SUGGESTED AIR CONTACT.

Well, I think I'm sure he's talking about the hotel in Hong Kong.

THAT'S RIGHT. (Metropole)

They were all on one floor of the hotel. We know that a couple of the people had fairly close contact. We don't, I don't know more than that, so I can't really explain it. What I can say is that what I've been told is that workers in the hotel did not come down with the illness and people on other floors on the hotel did not come down with the illness.

There are two ways to look at it. I think the fact that workers in the hotel did not come down with the illness and people on other floors did not come down, suggests that just casual contact was not enough to cause transmission.

DO YOU HAVE ANY WORRIES THAT THIS IS A MICROBE THAT COULD END UP CAUSING A PANDEMIC LIKE THE 1918 SWINE FLU?

It doesn't transmit like that. I don't think that's what we're dealing with. I mean, it's not going to be a pandemic like 1918 swine flu which spread very rapidly. Where it's going to go in terms of further spread, we don't know. It doesn't appear to have, at least so far, spread into the community and caused large amounts of community-acquired respiratory disease, so far in the communities of Hong Kong, Hanoi and Singapore, where it has been to some extent so far.

Now whether it's a new human pathogen that might be animal-to-human transmitted virus, nobody knows. What we're seeing is, seems to be different than what we've seen before."

A New Virus Spread from Animal to Human?

Hong Kong has worried about avian influenza which recently infected a family and the father and daughter died. That's a bird to human microbe. What if there is a new *Paramyxo* virus, perhaps even one that originated in animals such as bats or pigs, and has now mutated to infect humans?

I asked that question this week of Paul Glezen, M. D., Professor of Molecular Virology and Microbiology and Pediatrics and Epidemiologist for the Influenza Research Center at Baylor College of Medicine in Houston, Texas.

Paul Glezen, M. D., Professor of Molecular Virology and Microbiology and Pediatrics and Epidemiologist for the Influenza Research Center at Baylor College of Medicine in Houston, Texas: "I think there is a very good possibility of that. We're obviously we are speculating based on limited information, but we know that the laboratories that have looked for this were laboratories that should have been able to identify the usual human *Paramyxo* viruses. So, if it was Parainfluenza 1, 2 or 3 or whatever, they should have identified that right

away. And the fact that they could not isolate or identify this with the PCR or whatever, means that it is probably a new virus. So, that's why you have to be concerned because if it had been one of the usual Paramyxo viruses that commonly cause upper respiratory illness in adults. They cause bad croup and pneumonia in little kids, but usually by the time we are adults, we don't get bad illness. So, we don't expect a healthy adult to get a fulminating pneumonia from a Parainfluenza 1, 2, or 3.

So, that's the way I look at it. I'm trusting the expertise of these labs, which we are told are all good labs. And I know that Hong Kong, since 1997, they have really been tooling up their virus diagnosis and everything. I think the labs in Hong Kong would have been right on top of this and if it had been one of the usual Paramyxo viruses, we would know it.

THE FACT THAT IT MAY BE NEW IS WHY IT COULD BE SO VIRULENT AND THAT WE MIGHT BE FACING A PANDEMIC?

I wouldn't call it a pandemic, but we could be facing another new respiratory virus pathogen which and since it had not circulated in the human population before, it would mean the adults are as susceptible as young children are to the ones we see commonly in humans.

DR. HEYMANN IN GENEVA TOLD ME THIS WEEK THAT WHAT SURPRISED HIM AND OTHERS IN THE WORLD HEALTH ORGANIZATION IS THAT THERE HAVE BEEN SO MANY PEOPLE NEEDING RESPIRATORY VENTILATOR ASSISTANCE.

Right. That is very alarming. Now, the other thing that Dr. Anderson mentioned yesterday (CDC) is another Paramyxo virus that was discovered and it definitely was an animal reservoir infecting humans. But up to now, those viruses had not spread from human to human, at least not that we can readily see.

So, there was the Hindra virus first in Australia that people taking care of a sick horse contracted and I think there were a couple of deaths, but only three humans infected. Then they found this new Paramyxo virus. The source of this eventually was determined to be fruit bats who infected the horse and the humans got infected from this sick horse.

Then in Malaysia, there was a report of an encephalitis disease in pig farmers and they of course first suspected Japanese B encephalitis, but couldn't find that. But they shipped their pigs to Singapore and then there was an outbreak in an abattoir in Singapore among the people who were butchering the pigs. Again, a lot of these were encephalitis which is alarming.

But it said I just reviewed the report they did have evidence of infiltrates in their lung, too, like they had pneumonia.

THIS WAS DEFINITELY LINKED TO A NEW *PARAMYXO* VIRUS?

Yes. And this was called the Nippah virus, and it is closely related to the Hendra virus.

SO THESE TWO PRIOR INCIDENTS, NOW COMING TO FEBRUARY AND MARCH OF 2003, DOES IT MEAN TO YOU AS A VIROLOGIST THAT THOSE TWO *PARAMYXO* VIRUSES THAT ERUPTED NEW FROM ANIMAL TO HUMAN, THERE COULD HAVE BEEN YET ANOTHER VARIATION, THERE IS ANOTHER NEW *PARAMYXO* VIRUS IN THIS SARS SYNDROME?

Right, either that. Or maybe one of these viruses (Hendra or Nippah) had a mutation that now allows it to spread among humans.

So this group of viruses are pretty interesting in the anatomic areas of the lungs that they attack. But basically what we are talking about here (with SARS) that can occur with any of the *Paramyxo* viruses is interstitial pneumonitis and what happens there is that you get inflammation in the lining of the alveoli so that the

cells and fluid enters between the membranes of the alveoli and impairs the ability to exchange oxygen just by mechanical obstruction there.

So an interstitial pneumonia is probably what they are describing and then how extensive this is depends on how disabled the person is. Of course, if there is sufficient interstitial involvement, then they are going to have to go on a ventilator and need high concentrations of oxygen and everything to get them through it. And hopefully they will make it, but some of them won't.

WHICH IS WHAT HAS BEEN HAPPENING AND IT IS BECAUSE THIS SARS SYNDROME IS ATTACKING THE ALVEOLI INTERSTITIAL AREA AND THAT IS APPARENTLY WHY SO MANY PEOPLE ARE ENDING UP ON VENTILATORS.

Right, and this is different than a bacterial pneumonia where instead of just being an interstitial infiltration, you'll just have the alveoli full of pus. So, bacterial pneumonia will just generate pus that will fill the airways and alveoli and it is usually localized to just one area of the lung, fortunately.

But the viral interstitial pneumonias tend to be pretty generalized in the lung and if they are extensive enough, then patients go into respiratory failure and one of the terms they (SARS investigators) have used is "adult respiratory distress syndrome." That's really lung failure, respiratory failure, when they have to go on a ventilator to save them.

RIGHT NOW, DR. HEYMANN THINKS, BASED ON THE EXPERIENCE SO FAR, THAT THEY CAN CONTAIN PATIENTS AWAY FROM THE GENERAL POPULATION AND AS LONG AS HEALTH WORKERS ARE WEARING MASKS, THAT THEY CAN CONTAIN THE SPREAD OF THIS DISEASE. WHAT WOULD YOUR COMMENT BE?

Well, ideally you need isolation rooms with negative pressure so that when you open the door, air flows into the room and then it is exhausted out through filters. That's ideally what you need for isolation for airborne infections.

Now, we can handle a few of these, but if this became an epidemic, you can see that we would very quickly run out of good isolation rooms for these patients. That's a problem and it's one we need to think about, whether it is an influenza pandemic or a new agent like this, or whatever. Ore a bioterrorist attack where we need to isolate patients with smallpox, for instance. We don't have enough facilities right now to handle real epidemics of these. But if they are in limited numbers, we can handle them well.

Again, this goes back to pandemic preparedness and all this other stuff bioterrorism alert and all this stuff. We need to have the ability to sort out these diseases and we need to do it quickly because it is not sufficient to say we have an outbreak of influenza-like illness that closes all the schools in Texas, which we've had this winter. If you're not able to go right in and identify the agent and say, 'This is just influenza B, Victoria lineage. We don't need to worry about it.' Or is it some new agent? A new virus or some other new agent circulating?

So, I think those tests are available, but they are not distributed strategically to allow us to make rapid decisions and conclusions and that's what we need."

Websites:

http://www.who.int/en/ (World Health Organization)

http://www.cdc.gov/ (Centers for Disease Control)

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