Patient Care During the Zika Outbreak

September 26, 2016

NACPM Webinar
I have no disclosures.

Member of the American Congress of Obstetricians and Gynecologists (ACOG) Ad Hoc Zika Expert Workgroup
Patient Care During the Zika Outbreak

First time in history...

“Never before in history has there been a situation where a bite from a mosquito could result in a devastating malformation.”

–Dr. Tom Frieden, CDC Director, *Fortune*, April 13, 2016
Zika Virus Infection with Prolonged Maternal Viremia and Fetal Brain Abnormalities


SUMMARY

The current outbreak of Zika virus (ZIKV) infection has been associated with an apparent increased risk of congenital microcephaly. We describe a case of a pregnant woman and her fetus infected with ZIKV during the 11th gestational week. The fetal head circumference decreased from the 47th percentile to the 24th per-
Zika Virus in Pregnancy

- Trip to Central America
  - Guatemala
  - November
- Onset of acute disease
  - mild fever, eye pain
  - myalgia, rash
- Serum sampled (Finland)
  - DENV IgM - IgG + (>1000)
  - ZIKV IgM + IgG +
  - ZIKV RNA positive
- Serum sampled (USA)
  - DENV IgM -
  - ZIKV IgM +
  - NT ZIKV > DENV
- January
  - Patient informed of
    - ZIKV RNA positive result
- February
  - Blood, serum, saliva
    - urine, plasma, PBMC
    - sampled (Finland)
    - ZIKV RNA negative
- Gestational week
  - 25
- December
  - Ultrasound: normal fetal head size
  - 10
- 15
- 25
- 20
- 5
- 10
- 15
- 20
- 25
- 5
- 10
- 15
- Abortion
- Ultrasound: normal fetal head size
  - 16
  - 17
- Severe fetal brain abnormalities in ultrasound and MRI
  - amniotic fluid
  - ZIKV RNA positive
  - Serum ZIKV RNA positive
- High ZIKV RNA loads in brain, placenta and fetal membranes/umbilical cord
- Virus isolated from brain sample in SK-N-SH and VE6 cells
Zika Virus in Pregnancy

Decrease in centile from 47th at 16 weeks to 24th percentile at 20 weeks
Zika Virus in Pregnancy
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Zika Virus in Pregnancy

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- Serum ZIKV RNA positive

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- February

- March

- April
Zika Virus in Pregnancy

- Husband had concomitantly developed similar symptoms
- ZIKV IgG and IgM were positive 5 weeks after travel
- Urine ZIKV RNA negative 11 weeks after travel
- Sera ZIKV RNA negative 5* and 11 weeks after travel
- Semen ZIKV RNA negative at 10 and 12 weeks after travel

* Spouse’s serum still ZIKV RNA positive at 5 weeks
How I became a Zika refugee in Maryland

By Brandon Levitt

So I'm not a traditional refugee. But I have been forced to leave my city to escape a mosquito.

My wife and I have lived in the same neighborhood at the southern tip of Miami Beach for nearly 10 years. It's an area south of Fifth Street that locals call “SoFi.” It's surrounded by water on three sides and tourists on the fourth. It's quiet, for Miami Beach standards. That is to say, there's a massive club three blocks from my apartment, but only local bars and restaurants across the street.
How I became a Zika refugee in Maryland

Everything I need is in walking distance, or Uber distance or scooter distance. Most locals can't imagine living anywhere else. In fact, I tried to name my two-year-old daughter SoFi. But I have a wife, and she had a veto.

On one Friday in late July, the CDC announced that Zika mosquitoes were invading Miami. Two days later, my pregnant wife and I decided we needed to move. Five days after that, my wife, my daughter, and I were living in the basement of my in-law's house in suburban Maryland, several miles from recognizable society. There are deer in the backyard. Nothing is in walking distance. I don't have my scooter.
How I became a Zika refugee in Maryland

How did we get here?

It was early July. I had just found out my wife was pregnant with our second. I was feeling confident I could override my wife's SoFi veto. We knew about Zika mosquitoes and the brain damage the virus can inflict on a fetus, but we also knew there was no evidence of those mosquitoes in Florida.

On July 19, we learned about one possible case of “homegrown” Zika. Scary, but it was unconfirmed. And if Zika really made it to Florida, the mosquitoes would be in the Everglades, in my professional opinion.
How I became a Zika refugee in Maryland

Then on Friday, July 29, health officials announced four cases of locally transmitted Zika virus. The next day, they announced eight more. Worse, the Zika mosquitoes were in Wynwood, a restaurant and arts district a few miles from Miami Beach. And they had likely been there since mid-June. (They must have migrated from the Everglades.)

My wife and I had been to Wynwood countless times since mid-June. We dined at the restaurants, strolled through the farmer's market, and took our daughter there for her music classes. Did we get bitten by mosquitoes? Of course we did. A spacesuit couldn’t prevent a mosquito bite in Wynwood in June.
How I became a Zika refugee in Maryland

Chaos ensued.

It was Sunday, July 31. We had spent the last 48 hours tracing every step we took in Wynwood over the past six weeks. We read about Zika and the effect the virus can have on a fetus, particularly early in pregnancy. Halfway through one of those articles and we were prepared to buy one-way tickets to Maryland to move in with my in-laws.

But we hadn't even had our first OB appointment. It was the next day. For the first time in two days, rationality swept over us. We should at least wait until our first ultrasound before uprooting our lives.
How I became a Zika refugee in Maryland

It was Monday, Aug. 1. We stared at a tiny black and white speck on a larger black and white screen. We heard a heartbeat. That's all it took. My wife and daughter would fly up to Maryland on Thursday. I would drive up the day after.

But we still had a few days left. And a lot of unanswered questions. Can we work remotely? How long will we be gone? What about our daughter's preschool? What do we do with our apartment? What if my wife was already infected? We need to get tested. Are there doctors who specialize in Zika?
How I became a Zika refugee in Maryland

We had two days to get answers. Those days are a blur. I recall packing, cleaning, consoling, rationalizing and frantically getting answers to our questions.

And then we left.

The dust has now settled. We'll need continued monitoring, but all signs indicate my wife does not have Zika. She's feeling good. The speck has grown to a bean. We got our answers. We're adjusting to suburban refugee life. We learned Zika mosquitoes are now on Miami Beach, and felt more confident in our decision to move. But we miss our family, our friends, the beach. I miss my scooter.

Silver lining: this kid's name will be SoFi.
Can My Spouse Be Tested for Zika?

- The Levitt’s (as well as many other patients) desired testing of pregnant patient and spouse
  - Not an unreasonable request
  - Currently CDC only recommends testing symptomatic men with Zika exposure
  - Pregnant women with sex partners (male and female) who live in or who traveled to an area with active Zika virus transmission should consistently use barriers against infection during sex or abstain from sex for the duration of the pregnancy.
Pregnant and Zika Positive

**Pregnant women and their families ask:**

1) “What is the likelihood that my baby will be infected?”

2) “What is the likelihood that my baby will have microcephaly?”

3) “If the first ultrasound is normal, does that mean my baby is normal?”

4) “Is microcephaly the only birth defect to worry about?”

5) “Is there a treatment for Zika?”
Pregnant and Zika Positive

- Does not necessarily mean that the baby will have birth defects
- At this time, it is unknown what percentage of infected patients will have affected fetuses
- From data available outside the US, estimates range from 1-29%
- Consideration of amniocentesis should be individualized
  - The presence of Zika virus in the amniotic fluid might indicate fetal infection
  - Negative result does not exclude congenital Zika virus infection
- Ultrasound may detect brain abnormalities
  - Unclear how long after infection these abnormalities can/will appear
Pregnancy Outcomes Associated with Zika

Studies estimate risk of microcephaly from 0.9% to 29%

Other adverse outcomes include:

- Fetal loss/miscarriage, stillbirth
- Fetal growth abnormalities
- Eye abnormalities
- Neurologic abnormalities
- Hearing loss
- Intrauterine growth restriction
- Behavioral Abnormalities

Sources: Johansson MA, et al., NEJM; Brasil P, et al., NEJM
Pregnant and Zika Positive

- **Clinical Management**
  - No vaccine or specific antiviral treatment
  - Treat the symptoms
  - Rest
  - Drink fluids to prevent dehydration
  - Take medicine such as acetaminophen to reduce fever and pain
### Suggested timeframe to wait before trying to get pregnant

<table>
<thead>
<tr>
<th>Possible exposure via recent travel or sex without a condom with a man infected with Zika</th>
<th>Women</th>
<th>Men</th>
</tr>
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<tbody>
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<td><strong>Zika symptoms</strong></td>
<td>Wait at least 8 weeks after symptoms start</td>
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More questions than answers

• Does prior infection confer immunity?
• What if my newborn contracts Zika?
• When during pregnancy Zika virus infection poses the highest risk to the fetus?
Thank you!