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Dengue Fever Prevention: How to Protect Patients Traveling Abroad

Dr. Turck:

You're listening to *VacciNation* on ReachMD. I'm Dr. Charles Turck, and joining me to discuss how we can protect our patients traveling abroad against dengue fever is Dr. David Hamer. He's a Professor of Global Health and Medicine at the Boston University School of Public Health with a special interest in infectious diseases. Dr. Hamer, welcome to the program.

Dr. Hamer:

Thank you very much for having me.

Dr. Turck:

Now for some background, cases of dengue have more than doubled since 2023. So to start us off, Dr. Hamer, what should we know about this rise of cases and how it affects travelers?

Dr. Hamer:

There's been a massive increase in dengue, particularly in Brazil and parts of South America and the Caribbean in the first six to seven months of this year, and then in South Asia and Southeast Asia; as the monsoon season has swung through, there have been a lot of cases there as well, and it's much higher than usual. It may relate to changes in rainfall pattern, but also this having been one of the hottest summers on record, so climate change. But in any case, there's more dengue.

Dengue is carried by mosquitos, and there's really been a surge in mosquito populations in certain places. The risk for travelers is substantial, and I run a surveillance network that's called GeoSentinel, and we look at returning travelers and identify what they're infected with and where they traveled, and we have just seen a massive increase in dengue cases this year, so there's definitely a risk for travelers.

Dengue is an interesting disease because it can range from completely asymptomatic to a fairly intense illness characterized by fever, rash, headache, eye pain, bone pain, and sometimes muscle and joint aches to a disease that's called severe dengue where there can be major fluid shifts and bleeding complications and potentially death. Now fortunately, severe dengue only occurs in a small proportion of patients. Although for people that are having dengue for a second time, there's appears to be an increased risk of severe dengue, and there is a small risk of mortality associated with dengue. It's relatively small, but when you start having hundreds of thousands and millions of cases, even if it's only 0.1 percent, you end up with a lot of deaths.

Dr. Turck:

Well with that increasing prevalence in mind, which vaccines have helped prevent dengue in the past?

Dr. Hamer:

Oh, this is a really tough question. There are two vaccines that have gone through approvals in both the United States and outside of the United States. One of them is called Dengvaxia. It didn't work so well because—it's a complicated story—but basically, it seemed to protect well against dengue-related hospitalizations and severe dengue for a year or two, and then they started having breakthroughs with recurrent episodes, and they eventually figured out that it related to whether or not the vaccine was given to people that were previously seropositive or not. Those who were previously seropositive seemed to have a better benefit from the vaccine than those who were not, and this relates to a complex phenomenon called antibody-dependent enhancement or immune enhancement that may occur

after somebody's had an episode of dengue. In any case, the Dengvaxia ended up causing a major public health problem. That vaccine has been taken off the market because of concerns about both safety and its lack of efficacy against all four serotypes of dengue.

There is a second dengue vaccine that is a live attenuated vaccine, and that went through approval by the European Medicine Association, and several countries in Europe have adopted that and are currently using that to protect travelers. It went through review by the FDA and ACIP, and the ACIP pushed for more data, and eventually, the company Takeda that was making it withdrew the vaccine from consideration until they collect additional data, so right now, we have no dengue vaccine available for US travelers.

There is a newer vaccine made by both Merck and Butantan, a company in Brazil, and that is a single-dose vaccine that showed 80 percent protection but only against serogroups 1 and 2 because that's all they saw during the course of the trial that was recently published. So that looks good, but we don't really know how it works against dengue serotypes 3 and 4.

Dr. Turck:

For those just tuning in, you're listening to *VacciNation* on ReachMD. I'm Dr. Charles Turck, and I'm speaking with Dr. David Hamer about prevention of dengue.

So in addition to this perhaps up-and-coming vaccine, Dr. Hamer, what else can providers do to better prepare frequent travelers about the risks of dengue and other infectious diseases that are endemic abroad?

Dr. Hamer:

So dengue, like chikungunya, zika, and a number of other viral infectious diseases, is carried by mosquitos and, in particular, by daytime biting mosquitos of the Aedes family, and so anti-mosquito measures during daytime hours, including early morning all the way through early evening—which are times of the day when these mosquitos may be most active—are important to counsel travelers on using. And these include wearing long-sleeve clothing, lighter colors because darker colors tend to attract mosquitos, and then using effective insect repellants.

I think it's important for physicians to know about the epidemiology of dengue, including how it's transmitted but also where it's being transmitted so that they can advise their travelers on anti-mosquito measures to help reduce their risk of having mosquito bites during travel to dengue-endemic areas, and unfortunately, there are many, many areas of the world now. Much of Latin America and the Caribbean, almost anywhere in Southeast Asia and South Asia, and increasingly in coastal areas of Africa but also the countries that border the Sahara have had big outbreaks of dengue in the last year, so there are a lot of places where there's a risk of dengue.

Dr. Turck:

Now from our discussion, it certainly seems that great progress has been made, but what additional research is needed to improve our understanding in prevention of this disease?

Dr. Hamer:

There's a lot of open research questions. We need to understand the natural history of the disease more. There's actually some evidence that there may be a post dengue, like a long dengue where people have difficulties concentrating and thinking and persistent headaches that can last for several months after an episode. We don't know how often that occurs. I think the most important is really understanding how we can develop a vaccine that protects against all four serotypes and doesn't lead to an increased future risk of severe disease. Ultimately an effective vaccine and ideally a single-dose vaccine would be a game-changer for travelers.

Dr. Turck:

Before we close, Dr. Hamer, is there anything else you'd like to share with our audience today?

Dr. Hamer:

You know, I think it's important for people to be aware of dengue but also for physicians and clinical personnel to be thinking about that as a diagnosis in febrile-returning travelers but even sometimes in their own state or country because increasingly, we have the right vector in place in many parts of the United States and Western Europe, and all it takes somebody to come in who's carrying dengue in their system, a mosquito bites them, goes on to bite somebody that hasn't traveled, and unless you're thinking about it, you're not going to make the diagnosis. So I think we need to raise awareness of the potential risk for local transmission of dengue as well as imported dengue.

Dr. Turck:

As those thoughts bring us to the end of today's program, I want to thank my guest, Dr. David Hamer, for joining me to discuss dengue

prevention. Dr. Hamer, it was great having you on the program.

Dr. Hamer:

Thank you very much for having me.

Dr. Turck:

For ReachMD, I'm Dr. Charles Turck. To access this and other episodes in our series, visit *VacciNation* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening.