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Bacteria in Bartonella: What We Need to Know

Dr. Greenberg:

Amid the COVID-19 pandemic, there's another emerging infectious disease threat on the horizon, and that's Bartonella Infection. What that is and how dermatological symptoms might present is what we'll be exploring today.

Welcome to *DermConsult* on ReachMD. I'm Dr. Michael Greenberg, and joining me today to discuss the association between Bartonella infection and skin lesions is Dr. Ed Breitschwerdt, the Melanie S. Steele Distinguished Professor of Internal Medicine, North Carolina State University. Ed, thanks for being here, today.

Dr. Breitschwerdt:

Michael, thanks for having me.

Dr. Greenberg:

To start us off today, tell us a little bit about yourself and how you became interested in Bartonella.

Dr. Breitschwerdt:

By training, I'm a veterinarian internist, so, historically, my patients have been small animals, cats and dogs, and my research beginning in the early 1980s has been in the area of vector-transmitted infectious diseases, predominantly looking at organism transmitted by ticks, but then with time, organisms transmitted by fleas and that's what really got us focused on Bartonella since cats are a major reservoir for flea-transmitted Bartonella species. So, our initial research with this genus started with trying to understand what these bacteria were doing in cats.

Dr. Greenberg:

How common are Bartonella infections?

Dr. Breitschwerdt:

That's a really good question. In human medicine right now, Bartonella infections really fall into 2 categories, 1 is Cat Scratch Disease, which has been historically recognized for literally 100 years. It took almost 100 years to figure out the organism that was actually causing Cat Scratch Disease, which becomes Bartonella henselae and I think the scientific literature understands that at this point in time, only one of the Bartonella species, which now, there's over 40 causes of Cat Scratch Disease. The other population that's been fairly intensively studied in the context of Bartonella are people that are immunocompromised, either HIV patients, or transplant recipients and in that instance, there's been infections with predominantly Bartonella henselae or Bartonella quintana, but other Bartonella species have been identified, as well.

Dr. Greenberg:

As a practicing dermatologist, and I think it's probably the same for general practitioners, I don't see much Cat Scratch Fever; actually I've never seen it or have I missed it? I mean, to most of us, Cat Scratch Fever is a Ted Nugent song.

Dr. Breitschwerdt:

So, I don't think Cat Scratch Disease is typically seen by dermatologists, probably more often by emergency clinicians and internists and pediatricians, since the majority of patients are children. In the context of Cat Scratch Disease, I think any physician would recognize it as an acute onset febrile illness associated with lymphadenopathy and a history of Cat Scratch, so that's kind of the classical triad, and the diagnosis is fairly straight forward. The disease is thought to be self-limiting, although our research has suggested that some people remain infected which is again very different than what the current textbooks say.

Dr. Greenberg:

Can you tell us about your study and what inspired it and what did you learn?

Dr. Breitschwerdt:

So we started with Bartonella in cats and then actually discovered the first Bartonella to infect a dog anywhere in the world, which became a new Bartonella species. That particular dog had endocarditis, which is another major disease manifestation that Bartonella induces in humans. And then went on to start trying to understand the disease in animals as I would lecture at national and international meetings about what I thought were exciting things we were finding in cats and dogs. I would have veterinarians come up and ask if they could be tested. And as a result of that, we started testing veterinarians and the first family that we tested, the father was a faculty member at NC State and was being seen by the neurology service at UNC Medical School and after that particular situation, where he was actually infected with 2 Bartonella species, we started looking at veterinarians being at occupational risk for being infected with Bartonella since we have a lot of contact with animals that are carrying the bacteria as well as sometimes the vectors that they're bringing in during the process. So, it became pretty obvious early on that there might be something important related to Bartonella and neurologic disease. We then, working with a physician in Ohio, described a young man that had a diagnosis of PANS or Pediatric Acute-onset Neurologic Disease and unfortunately, he had been evaluated for over a year and a half; he had been institutionalized a number of times and he had been treated with a spectrum of neuro-psychiatric drugs that didn't benefit him very much. He had cutaneous lesions that developed during the onset of his neuro-psychiatric illness and ultimately, my laboratory proved that he had Bartonella in his blood. He was treated by a team of physicians, and ultimately, completely recovered. So, that case report actually resulted in a lot of e-mails from, generally parents or individuals that had neuro-psychiatric illness that were seeking testing.

Dr. Greenberg:

Well, that's amazing. That sounds like the story of finding out that ulcers are really caused by Helicobacter and in solving those. For those just tuning in, you're listening to *DermConsult* on ReachMD. I'm Dr. Michael Greenberg, and today I'm speaking with Dr. Ed Breitschwerdt about his study on Bartonella infections and it's a fascinating subject that I think we all need to listen to. So Ed, getting back to our discussion, can you describe the unique skin lesions that are observed in these infections?

Dr. Breitschwerdt:

So, when we entered into this study, the derm lesions really weren't an important component of what we were interested in at that point in time, and again, my laboratory is focused strongly on the ability to diagnose particularly intracellular vector-borne organisms with a greater degree of sensitivity, so the major question we were trying to answer was, "Could we find Bartonella DNA in patients with neuro-psychiatric illness; yes or no?" When we started putting this case series together, which 33 individuals had contacted us in about a 14-month period and their testing was complete, we came to realize that 83% of them had skin lesions that had developed in conjunction with their neuro-psychiatric illness. And there were previous publications, essentially, small case series or case reports in which physicians had described, essentially, stretchmark-like lesions and that created some controversy in regard to could you have an infectious agent that induces a lesion that mimics striae-distensae, and these lesions are actually much more diverse than just the serpiginous vertical lesions that we would see in some patients. And Michael, to be honest, when I first read some of the early case reports where they suggested that Bartonella was causing these lesions, I was very skeptical that there would be any association, whatsoever, but I'm less skeptical now.

Dr. Greenberg:

Well, I think this is really fascinating because I see patients all the time with striae-distensae, and I see kids with neurological problems, too, and maybe I need to be more aware. So, that's the next question: should dermatologists be made more aware of these skin lesions?

Dr. Breitschwerdt:

Well, I think clearly, there's a tremendous need for studies to determine if it's truly Bartonella that's causing these lesions and I think that dermatologists, neurologists, and psychiatrists might have an important common interest in a subset of patients that have unusual skin lesions that develop in conjunction with their neuro-psychiatric symptoms.

Dr. Greenberg:

Right. Do you have any instances of dermatologist making the primary diagnosis from the skin lesions?

Dr. Breitschwerdt:

Dr. Paul Reicherter is a dermatologist who's on the faculty at the University of Missouri, Kansas, and he worked with us in describing the lesions, but to be honest, most of our research on Bartonella really started with animals transition to worrying about veterinarians and veterinary workers having occupational risk and actually perhaps being the canary in the coal mine by which we better understand what Bartonella is doing in humans to then focusing in on neurologic manifestations based on prior cases with veterinarians and this one case

report that was, you know, fairly remarkable, those parents had spent half a million dollars in medical bills before we found *Bartonella henselae*. So I think that the answer to your question is, "No, there was not a dermatologist involved in directing." And as we stated in the manuscript, most of these people had never sought a consult with a dermatologist, which is one of the reasons that I think dermatologists being aware of this association at this point in time is important.

Dr. Greenberg:

Yeah, why do you think that dermatologists were never consulted? Was it just that the neuro-psych symptoms were so much worse that people never worried about the skin lesions?

Dr. Breitschwerdt:

Absolutely. Some of these individuals reported being suicidal, homicidal, chronically depressed, memory loss, agitation, combativeness, and I think for when the individual's dealing with that or when the parents are dealing with that, having a skin lesion that changes over the course of the illness, oftentimes, early on, these are very red, inflamed in appearance and slightly raised, but with time, they become much less so and then ultimately can just become a blanched linear, white-like lesion.

Dr. Greenberg:

Well I think this is a really important subject and we're glad to help spread the word here at ReachMD and I always consider the possibility as I'm listening to you, especially, if we can save one kid, you know, one dermatologist can be on rounds and notice something, I think that would be well worth spreading this. So, what are you doing to help spread the findings? Especially in the derm universe about the skin lesions?

Dr. Breitschwerdt:

So, ultimately, I made the decision to submit it to an infectious disease journal because I was confident with the microbiology work that was done in our laboratory and again with the help of Dr. Reicherter that we had worked with previously, I felt confident that the descriptions that ended up in the manuscript were descriptions that were acceptable to an academic dermatologist. One of the things I've come to appreciate with *Bartonella* is it takes a tremendous amount of time, effort, publications, and research by many different groups before paradigms tend to change. You brought up *helicobacter pylori* as an important bacteria that was literally a microbiological paradigm-changer in our understanding of ulcer disease, MALT-lymphoma, and gastro-adenocarcinoma, and I strongly feel that *Bartonella*, as a bacteria that can induce persistent infections in animals and humans that is transmitted by numerous factors, as well as needle sticks and other means, will become an equally important microbiological paradigm changer.

Dr. Greenberg:

Given the fact that *Bartonella* infections are an emerging threat, I wanna thank Dr. Ed Breitschwerdt for joining me to share his insights. Ed, it was great speaking with you today.

Dr. Breitschwerdt:

Thank you and I really appreciated the opportunity to share what we've been looking at on a research basis.

Dr. Greenberg:

For ReachMD, I'm Dr. Michael Greenberg. To access this episode and others from *DermConsult*, visit ReachMD.com/DermConsult, where you can Be Part of the Knowledge and we thank you for listening.