Joseph Burrascano MD, Guest Blog – Lyme Testing

May Awareness LDA Guest Blogger

Joseph J. Burrascano Jr. MD is a physician who was an early innovator in the field of tick-borne diseases, having begun his clinical research in the mid-1980s in cooperation with several other key pioneers. In addition, he is well known for

his educational presentations and for his monographs on diagnostic and treatment guidelines for Lyme and related tick-borne illnesses- a classic series that has been freely circulated around the world since 1989.

With over three decades of clinical experience and research in this field, he has appeared in and on virtually every form of media, has advised the CDC and NIH, testified before the U.S. Senate, an armed services joint subcommittee, and at various governor's councils. A founding Board Member of ILADS, he also served as a Director of the ILADS Educational Foundation.

A graduate of the NYU School of Medicine with a specialty in Internal Medicine, Dr. Burrascano left clinical practice in 2006 to enter the biotech space. However, he continues to be active in educating practitioners and the public on issues related to tick-borne diseases. He is an active writer and ghost writer and has authored or edited articles (both lay and peer-reviewed), book chapters, whole textbooks, web page content, public relations releases, book reviews and more. In addition, he serves on the editorial review board for several medical journals.

He currently works full time as a project analyst and manager for a private biotech company, helping to bring advanced technologies and treatments out of the lab and into general use. In addition, he is a clinical advisor for a specialty diagnostic lab, and his lifelong interest in nutrition has resulted in his ongoing consultative work with various nutritional supplement suppliers.

Quiet Revolution in Testing for Tick-Borne Diseases

I was thinking about how it was, over 35 years ago, when I first became aware of Lyme disease and began managing patients with this. One of the biggest problems then was confirming the diagnosis. My Lyme-aware colleagues and I were familiar with

the clinical presentation but too many times the Lyme tests, primitive as they were, were non-reactive. Thus “sero-negative Lyme.”

We learned over time that ticks were transmitting pathogens other than *B. burgdorferi*– first was Babesia, then a Bartonella-like organism came into play. When these were the primary cause of the illness, Lyme tests were negative and Lyme treatments did not help the patients. This explained a lot. If someone had Babesia they would not be expected to have a positive Lyme test. As time passed, more potentially co-infecting bacteria, protozoans and others were found. Perhaps all this seronegativity was appropriate after all.

Fast forward to today- thanks to a quiet revolution in testing that has uncovered previously unknown and/or unexpected tick-borne diseases, many more patients are able to get laboratory confirmation of their clinical diagnoses. Not only is it comforting to practitioner and patient alike to have a supportive lab test, it is also more important than ever to assure insurance coverage for treatments, and for practitioners who may be under constant scrutiny by their medical boards.

With Lyme, using advanced testing methods, it has been shown that many patients who were seronegative on standard testing were found to have infection with species of Lyme Borrelia other than *burgdorferi*. They actually were infected with members of the *Bb sl* complex previously thought to not be in America! These species were unlikely to be detected by tests based upon the lab strain of *B. burgdorferi*, B31. Here, seronegativity was not because of poor test quality, but because of testing for the wrong species.

An even more surprising finding is that many seronegative Lyme patients did not have Lyme *Borrelia*– they had tick-borne relapsing fever *Borrelia*! How is this possible? How could relapsing fever be confused with Lyme? After all, the

textbooks describe TBRF as having an acute onset with high fever and severe chills and malaise, followed by a drenching sweat and then relative normalcy until a relapse of similar symptoms occurs five or so days later, that then repeats. Clearly a distinctive presentation, but the problem is that in many patients, TBRF presents as “seronegative Lyme” and not as classic relapsing fever. Apparently the TBRF spirochetes did not read the textbook! It seems this “classic” presentation of TBRF occurs relatively rarely, similarly to the rarity of Bell’s Palsy in “classic Lyme”. So again, seronegativity was due to testing for the wrong species.

Bartonella is notoriously difficult to document with blood testing, and now with the possibility that greater than thirty species could be pathogenic to humans, better testing is really important. The key here is the ability to test for these multiple species. Nowadays we have multispecies western blots (soon to be replaced with immunoblots), multispecies PCRs and FISH tests.

Droplet digital technologies seem to be another advance. Finally- these “stealth” infections are no longer so stealth.

And what about Babesia? Same issue? Yup. Research has shown that several species of Babesia can and do infect humans, and the genus-level testing now available can uncover infections that previously went undetected.

This testing revolution has even extended to COVID-19, with immunoblots available that are not only more sensitive and specific than standard serologies, they can identify whether the immune reactivity is to a natural infection or due to vaccination. While this serological approach is a great advance, it only demonstrates B-cell response to the infection. Thankfully, we now have T-cell response testing and combining the two will give a much needed, more complete picture of a patient’s status.

Looking forward, the revolution will continue with the expanded application of immunoblot technology to additional pathogens. Tests that detect the pathogen’s RNA, which is only present in an active, ongoing infection, are expanding. Currently the FISH test does this, and other RNA-based detection methods are being developed. Along the same lines, looking for the presence of bacteriophages may prove to be a useful way to detect disease activity.

It is very exciting to see that skin biopsies are coming of age thanks to recent advances. The full spectrum of nerve damage seen in tick-borne illnesses will soon be able to be documented- not only damage to small cutaneous fibers and the pre-ganglionic innervation of sweat glands, but even demyelination can be seen! These direct tests that show what we have been postulating but could not prove represent a major advance. And these same biopsies hold the promise to be a highly efficient way to conclusively show infection with Bartonella species.

For decades we had to struggle with little more than clinical diagnoses- we knew our patients were ill but we could not prove it and care oftentimes could not be given. Finally, testing science is catching up with us. It’s about time!