

# Gestational Lyme Disease Case Studies of 102 Live Births

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### Background:

Maternal-fetal transmission of *Borrelia burgdorferi* (Bb), the causative agent of Lyme disease, although found to be associated with adverse outcomes and increased cases of congenital infection, has been met with divergent professional opinions requiring further research to resolve. The exact incidence and capability of transplacental transmission of the spirochete, *Borrelia burgdorferi*, has raised concern as a result of transmission of several other spirochetal agents, including *Treponema pallidum*. Syphilis and Lyme disease (LD) are both caused by spiral-shaped bacteria, called spirochetes, so the inference may be drawn that the disease processes are likely to be similar. Years of research on congenital syphilis (CS), caused by the spirochete *T. pallidum*, demonstrated that CS surveillance is complicated by difficulty in establishing the diagnosis, that most infants born with CS have no signs of disease at birth, and that it is almost entirely preventable with early prenatal screening and treatment. (1)

Gestational Lyme disease continues to be an often misunderstood and misdiagnosed condition. A

significant number of past studies conducted on LD during pregnancy have repeatedly found pregnancies resulting in adverse

### Gestational Lyme: Frequency, Prevention & Treatment

According to Charles Ray Jones, M.D., out of over 7,000 children seen, 300 (approximately 4%) have gestational Lyme. Data from his practice indicated that of 66 mothers with Lyme disease who were treated with antibiotics prior to conception and during the entire pregnancy, all gave birth to normal healthy infants. However, 8 pregnancies resulted in *Borrelia burgdorferi* and/or *Bartonella henselae* positive placentas, umbilical cords, and/or foreskin remnants. Those with positive PCRs were treated with 6 months of oral antibiotics and are without symptoms 3 months to 4 years later.

fetal outcomes and cases that presented with clinical findings possibly caused by transmission of Lyme disease but the lack of positive diagnostic testing using ELISA, indirect fluorescent antibody (IFA), and Western blot has left researchers still questioning the cause of these findings as

being Lyme disease. Therefore, in light of a recent report by Dr. Steven Phillips, et al (2) showing the inadequacies of currently accepted standards for serologic diagnosis using the ELISA and Western blot, dismissal of Bb in maternal-fetal transmission based on this type of testing is not possible. Another reason for concern is that prior clinical studies determined that shorter courses of antibiotic treatment have resulted in 50% of victims suffering from a persistent infection both in early localized Borreliosis and later disseminated intracellular Borreliosis. (3) The insidious nature of gestational LD can present a complicated diagnosis due to the delay of presentation, the multisystemic often transient nature of symptoms that can vary in degree of severity and change with progression of the disease, and finally, the unreliability of standard diagnostic tests.

### Objective:

To better define the diversity in manifestations of gestational Lyme disease and present a more homogenous list of clinical symptoms. Provide more effective treatment protocols that address the three major *Ixodes*

*scapularis* tick-borne illnesses (Lyme disease, Babesiosis, and Ehrlichiosis).

### Methodology:

Comprehensive case history studies on one hundred and two pediatric or adolescent patients diagnosed with gestational Lyme disease. The diagnosis of the children was clinical. Although identical testing was not performed for each child, positive diagnostic tests were as follows: ELISA—25%, Western blot—58%, LUAT—25%, Culture—37%, PCR (urine)—4%, PCR (blood)—7%, SPECT scan—11%, MRI—8%. The rate of various co-infections were: strep—7%, leptospirosis—5%, fungal or yeast—4%, ehrlichiosis—6%, babesiosis—14%.

### Results:

The mothers of children in this study all had either untreated or partially treated LD, some as a result of *Ixodes scapularis* tick attachments actually during their pregnancy. Most often, the mothers were diagnosed prior to their children when the children were between one and five years of age. A retrospective analysis of the progression of symptoms revealed that oftentimes many initial symptoms were present in the infants, however, were overlooked until they gradually progressed in frequency and severity.

All the mothers had untreated or inadequately treated Lyme prior to or during pregnancy and 16% had received some treatment prior to their pregnancy. Sixty-six percent had a difficult pregnancy, most notable for, but not always inclusive of the following: complications during pregnancy, false labor, history of spontaneous abortions, severe fatigue unresolved by rest, nausea, vomiting, fevers, impaired cognitive function, inability to function during the pregnancy, and illness that continued beyond the delivery. Forty-one percent of the mothers breast fed their children. Although gestational Lyme disease symptoms may present subtly at birth, the implication may be drawn that serious neurological disease will result without prompt diagnosis and treatment. In fact, the children of this study were diagnosed typically between one and five years of age and by this point were completely stricken with a deeply entrenched and chronic

Borrelial neurological infection. Several of the cases experienced further deterioration following exposure to Bb through subsequent tick bites and a significant number were also infected with multiple tick-borne pathogens.

Systemic abnormalities were common, with 59% of the children exhibiting low grade fevers, 72% with fatigue and lack of stamina, and 23% with night sweats. Forty-two percent of the children were pale and sickly with dark circles under the eyes. GI symptoms were also common: GERD (27%), abdominal pain (29%), diarrhea or constipation (32%), and nausea (23%). Twenty-three percent of the children had cardiac abnormalities, including palpitations/PVC, heart murmur, and mitral valve prolapse. Orthopedic disorders presented as jointed sensitivity (55%), pain (69%), generalized muscle pain or spasms (23%), and stiffness or retarded motion (23%). Upper respiratory infections were common.

Only 6% of the children presented with a greater degree of arthritic symptoms, while the majority of children presented with extensive neurological symptoms. Neurological presentations most common in this study were headaches (50%), irritability (54%), and poor memory (39%). Developmental delays occurred in 18% of the children, 11% had seizure disorder, 30% had vertigo, 14% had tic disorders, and 9% had involuntary athetoid movements. Many disabling symptoms affecting learning and rendering children unable to perform well in and out of school, including cognitive (27%), speech delay (21%), reading/writing (19%), articulation (17%), auditory/visual processing problems (13%), word selectivity (12%), and dyslexia (8%). The neuropsychiatric symptoms were widespread (anxiety—21%, anger or rage—23%, aggression or violence—13%, OCD—11%, irritability or mood swings—54%, emotional—13%, depression—13%) and sadly did not exclude even suicidal thoughts (7%). Hyperactivity, lack of concentration, and the diagnosis of ADD all together afflicted 56% of the children in the study. Sensory sensitivity manifested as hyperacuity (36%), photophobia (43%), motion sickness (9%), and other (tactile, taste or smell)

(23%). Nine- percent of the children had autism. Awareness among physicians also must be raised as to the less obvious adverse outcomes of maternal transmission of Lyme disease to the unborn fetus. A common symptom in infants is hypotonia (7%) as a result of neuroborreliosis. One child with symptoms of drooling, poor muscle tone and speech impediment improved with antibiotic treatment such that the child was able to pursue activities of a normal 2-year-old. In another case, the amniotic fluid and cord blood both tested positive for Bb, and the infant was born weighing only 5lbs. Although the child initially did have signs of early Lyme disease her continued treatment has prevented progression of symptoms. She is still undergoing antibiotic therapy but is doing well.

The most striking aspect of these cases is the

multisystemic threat that this illness possesses. There were cases which manifested few symptoms. This does not make their disease innocuous but is more representative of a low infectious load and a healthy immune response. However, this was more the exception than the rule. Some abnormalities alone might appear trivial and even unrelated, however, it is the combination of symptoms and the assault that the Bb bacteria makes on many systems that develops a pattern. As the chart below suggests, most children had more than one body system involved. Instead of seeking numerous causes from separate origins to explain vague, mounting, multisystemic symptoms, it is much more logical to realize one probable cause, which in these cases is Lyme disease. All children in the study improved with prolonged antibiotic therapy.

### Frequency of Gestational Lyme Symptoms in Children

According to Charles Ray Jones, M.D., most of the children born with gestational Lyme disease have manifestations of the disease at, or shortly after birth.

%	Symptoms
40	Gastroesophageal reflux with vomiting and coughing
80	Irritability
60	Low grade fevers, pallor, and dark circles under their eyes
72	Fatigue and lack of stamina
23	Secondary rashes
45	Other rashes
30	Eye problems: posterior cataracts, myopia, astigmatism, conjunctival erythema (Lyme eyes), optic nerve atrophy and optic neuritis and/or uveitis
40	Frequent upper respiratory tract infections and otitis
20	Abdominal pain
40	Noise, light and skin sensitivity
50	Arthritis and painful joints
18	Developmental delay, including language, speech problems and hypotonia
80	Cognitive problems, learning disabilities and mood swings
30	Cavernous hemangiomas
	<b>Diagnostic Tests</b>
50	Positive Western blots
20	Positive PCRs
21	Positive LUATS
37	Positive Bb blood cultures
11	Positive Brain SPECT
80	Neuropsychological evaluation confirmed cognitive problems