

	Ehrlichiosis		P value
	<65 years (n = 10)	≥ 65 years (n = 17)	
Median age	57	79	
SD	6.57	5.45	
Average length of hospital stay (days)	4.0	3.2	
SD	2.94	3.10	
Sex			
Male	8 (80%)	10 (58.8%)	0.3
Female	2 (20%)	7 (41.2%)	0.3
Ethnicity			
Hispanic	3 (30%)	0	0.02
Non-Hispanic	7 (70%)	17 (100%)	0.02
Clinical presentation			
Fever	7 (70%)	12 (70.6%)	1.0
Headaches/dizziness	5 (50%)	7 (41.2%)	0.7
Arthralgia	3 (30%)	2 (11.8%)	0.2
Fatigue	10 (100%)	14 (82.4%)	0.4
Myalgia	7 (70%)	4 (23.5%)	0.02
Tick exposure	4 (40%)	10 (58.8%)	0.4
Laboratory			
Leukopenia	8 (80)	15 (88.2)	0.6
Anemia	3 (30%)	10 (58.8%)	0.2
Thrombocytopenia	10 (100%)	17 (100%)	1.0
AKI	4 (40%)	8 (47.1%)	0.7
Transaminitis	8 (80%)	15 (88.2%)	0.6

Conclusion. HME is prevalent in Suffolk County. Clinical presentation and laboratory findings were largely similar between the two groups, except the younger population more often presented with myalgia. A risk factor in this study was to be young and Hispanic, likely due to occupational exposure.

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666. Human Granulocytic Anaplasmosis and Ehrlichiosis Presenting to an Upstate New York Emergency Department

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Background. Human granulocytic anaplasmosis (HGA) is an increasingly common tickborne infection in the North-East United States. Statewide incidence of human cases of anaplasmosis in New York (excluding New York City) increased 407% from 2010–2017, with a corresponding increase in *Anaplasma phagocytophilum* prevalence in ticks. While previous observational studies have described the clinical features of HGA, there has been little documentation of HGA diagnosed in the emergency department (ED) setting.

Methods. Demographic and clinical data were extracted from electronic records of cases with a positive polymerase chain reaction (PCR) for HGA or the closely related clinical entity ehrlichiosis from 2016 to 2017. HGA and ehrlichiosis PCR were performed by the Albany Medical Center laboratory on patients treated in the ED. Basic descriptive analyses were performed.

Results. During the 2-year period, there were 37 cases of PCR-positive HGA and four cases of PCR-positive ehrlichiosis treated in the ED. Electronic data were available for extraction for 40 of these cases. Mean age was 54 years old (range 7–94 years). Thirty-four (85%) patients presented with fever, and 9 (23%) reported a tick bite or tick exposure. Twenty-two (55%) patients had leukopenia; 32 (80%) thrombocytopenia; 26 (65%) hyponatremia; 24 (60%) elevated transaminases; 38 (95%) at least one of these laboratory abnormality; and 13 (33%) all four laboratory abnormalities. Twenty-four patients (60%) were given the empiric diagnosis of a tickborne illness upon disposition from the ED, with 19 (48%) patients admitted to the hospital.

Conclusion. To our knowledge, this study represents the first description of patients diagnosed with HGA (and ehrlichiosis) in the ED setting. Because of the inherent testing bias, further study is needed to establish the true ED prevalence of HGA in highly endemic regions. Notably, only 23% reported either a tick bite or tick exposure, highlighting the need to consider this for diagnosis in patients presenting to the ED with consistent symptoms and laboratory findings in endemic areas. Further study might explore whether there exists a collection of laboratory findings that could accurately identify HGA in ED patients.

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667. An Emerging Tick-Borne Disease in Long Island, New York: Relapsing Fever Caused by *Borrelia miyamotoi*

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Background. Suffolk County (Long Island, New York) reports annually the highest absolute number of tick-borne diseases in New York. A new *Borrelia* species, *Borrelia miyamotoi* which causes a relapsing fever, has been reported in New York recently. The aim of this study was to identify the number of cases of *B. miyamotoi* diagnosed in Suffolk county.

Methods. A retrospective chart review was performed in Stony Brook (SB) Medicine hospitals, SB University Hospital (the only tertiary medical center in Suffolk County) and Southampton Hospital (a major hospital in the east end of Suffolk County). Laboratory records were queried for a positive *B. miyamotoi* PCR test from blood or a positive IgG antibody with a *B. miyamotoi*-specific EIA that utilizes a recombinant GlpQ antigen (both tests performed in a commercial laboratory).

Results. Twenty-eight cases were positive for serology (IgG EIA; n = 19) or PCR (n = 9). None of the IgG-positive cases had a positive PCR result indicating that individuals were likely exposed to *B. miyamotoi* in the past. Of the nine PCR-positive cases (median age:67 years), eight were men, three were diagnosed in the outpatient clinic (33.3%) and six were diagnosed through the emergency department and required hospitalization (66.6%). Thrombocytopenia and transaminitis were common findings. Two-thirds of these nine cases were diagnosed in the period of 2016–2017 and one-third in the period, 2013–2015 (P = 0.17).

Conclusion. An increasing number of cases of *B. miyamotoi* were observed in Suffolk County during 2013–2017 and two-thirds required hospitalization. The real burden of this tick borne disease in Suffolk County and the rest of the state is unknown.

Table 1: Clinical-Demographics Features of *B. miyamotoi* Cases Diagnosed by PCR Blood Test

Year of Presentation	Age (Years)	Gender	Symptoms	Leukocytes (/mm ³)	Hemoglobin (g/dL)	Platelets (/mm ³)	Creatinine (mg/dL)	AST (U/L)	ALT (U/L)
2013	74	M	N/A	4,600	14.2	154,000	0.7	21	28
2015	67	F	Flu-like syndrome	5,500	14.7	260,000	0.8	33	23
2015	64	M	Flu-like syndrome	3,600	14.1	109,000	0.7	65	74
2016	32	M	N/A	3,000	15.6	166,000	1	98	65
2016	68	M	N/A	N/A	N/A	N/A	N/A	20	18
2016	74	M	Flu-like syndrome and vomiting	6,800	15.6	51,000	3.1	212	165
2017	90	M	Fever and vomiting	4,100	9.7	91,000	1.46	74	46
2017	22	M	Fever and diarrhea	3,200	14.7	99,000	0.8	73	117
2017	26	M	Fever and diarrhea	5,400	16.3	127,000	1.05	51	68

AST, aspartate transaminase; ALT, alanine transaminase; N/A, no available.

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668. Clinical Spectrum of Powassan Virus Infection in Patients Presenting with Suspected Acute Tick-Borne Illness From a Lyme-Endemic Focus in the Midwest

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Background. Powassan virus (POWV) is the North American member of the tick-borne encephalitis complex of viruses. The potential for concurrent transmission with other tick-borne pathogens, particularly the Lyme disease agent *Borrelia burgdorferi*, is under studied. To better understand the clinical spectrum of POWV infection patient health records were reviewed and laboratory studies performed to evaluate the frequency of tick-borne pathogen exposure in patients presenting with suspected acute tick-borne illness (TBI) from a Lyme-endemic focus in the Midwest.

Methods. One hundred and thirty-five samples selected from patients seen at Gundersen Health System presenting during 2016 with Lyme-like symptoms were tested for Anaplasmosis, Babesiosis, Lyme disease and POWV. PCR testing was performed for Anaplasma and Babesia. Serologic testing for *B. burgdorferi* was performed using two-tier serologic testing. POWV infection was confirmed by POWV-EIA/IFA (Coppe Laboratories). IRB approval was obtained.

Results. Anaplasma infection was seen in 44/88 (50%), Babesia infection in 5/67 (7.5%), Lyme disease in 45/135 (33.3%) and POWV infection in 16/132 (12.1%) patients. Co-infections were seen in 21/135 (15.5%) patients. Patients with Babesia more often presented with anemia, myalgia and decreased appetite. Patients with Anaplasma presented with fever, chills/sweats, nausea/vomiting, rash, elevated liver function tests, thrombocytopenia, leukopenia, and remembered the tick exposure. Lyme disease patients complained of fatigue, rash, chills/sweats, headache and remembered the tick exposure. Co-infection with both Lyme and Powassan virus was seen in 10/45 (23%) of patients. Patients with Lyme, Powassan virus or co-infection had no other significant difference in symptoms.

Conclusion. POWV infection is more prevalent in the Midwest than previously appreciated. Clinical data suggest that symptoms of POWV infection may be