Baylisascariasis Infection with Severe Outcome in Two New York City Children, 2008-2009

Brooke Bregman, MPH
Sally Slavinski, MPH, DVM

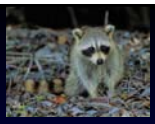
Presenter Disclosures

Brooke Bregman

(1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

Background



- Baylisascariasis: infection caused by intestinal parasite *Baylisascaris procyonis*
  - aka raccoon roundworm
- Raccoons are primary reservoir
  - Shed eggs in feces
- Incidental hosts include humans and other animals
- Rare cause of severe neurologic disease or death

B. procyonis

Epizootiology

- Fewer than 20 cases reported in US since early 1980's
- Most cases reported in children
- Risk factors include young age, developmental delays, pica, geophagia
- Thought to be under-recognized
  - asymptomatic and subclinical infections
  - difficult to diagnose

Epidemiology

- Most raccoons are infected *B. procyonis*
  - 68% to 82%
- Over 20,000 eggs can be shed in 1 gram of feces
  - Eggs infective within 2 weeks
  - Can persist in environment for years
  - Resistant to most cleaning products
- Communal raccoon latrines

Raccoon Latrine

Indoors

Outdoors

Clinical Disease

- Human infection occurs with ingestion of eggs
- Eggs hatch, larvae penetrate gut wall, and travel to other tissues
- Incubation period: 1-4 weeks
- Clinical severity dose dependent
  - extent and location of migration
  - Inflammatory response

Clinical Disease

- Neural larval migrans (NLM)
  - Severe, debilitating or fatal illness
  - Usually in young children
- Ocular larval migrans (OLM)
  - Complete or partial unilateral blindness
  - OLM seen in conjunction with NLM

Clinical Disease

- Diagnosis
  - Clinical presentation + laboratory evidence + risk history
  - Imaging: MRI and CT
  - Ophthalmologic exam
- Treatment
  - Anti-parasitic and corticosteroids
  - Photocoagulation
- Prophylactic treatment recommended

Background

- Two children diagnosed with baylisascariasis
  - Diagnosed within 3 months
  - Homes 15 blocks apart in Brooklyn
  - Both belonged to observant religious community
  - Both families visited upstate NY

Case Study #1

- 11 month old male
- Acute onset of developmental regression, irritability, postural deficits and seizures
- Preliminary diagnosis – eosinophilic meningoencephalitis
- Positive for *Baylisascaris sp.* by serology

Case Study #1

- No improvement with treatment of anti-parasitic and steroids
- Outcome – permanent brain damage

Case Study #2

- 14 yr old female
- Acute onset of blindness in right eye
- Ocular exam revealed a single large larva and retinal lesions consistent with OLM
- Positive for *Baylisascaris sp.* by serology

Case Study #2

- Treatment – photocoagulation to kill larva and steroids
- Outcome – child remains blind in right eye

Response

- Home visits and interview of both families
- Survey of residences and neighborhoods
- Environmental sampling at residence and local parks

Findings

- Families did not know each other
- Travel to common region of upstate NY
  - Case #1 traveled every weekend
  - Case #2 had sporadic travel
- Risk factors
  - Case #1: history of geophagia
  - Case #2: no risk factors identified
- Raccoons seen in neighborhood
- No raccoon latrines in either residence or nearby park areas
- All specimens negative for *B. procyonis*

Backyard of one case

Nearby park visited by one case

Outreach and Education

- Education materials developed and posted on public website
- Outreach to high risk communities
  - Daycares, WIC centers, communal housing areas in upstate NY, religious leaders

Outreach and Education

- Supervise children outdoors
- Wash hands
- Prevent raccoon habitat and latrines
- Clean up raccoon feces
- Prophylaxis and treatment

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Contact Information

NYC Department of Health and Mental Hygiene

Bureau of Communicable Disease

Zoonotic, Influenza, and Vectorborne Disease Unit

Brooke Bregman, MPH

blevinso@health.nyc.gov

212-788-4392