

# Diagnostic Testing Difficulties

- ◆ Antibody development
- ◆ Immune system deficiencies
- ◆ Persistence: cystic forms and biofilms of Borrelia
- ◆ False negative ELISA tests
- ◆ No Western Blot if ELISA negative in Canada, USA tests questioned
- ◆ Smears and antibodies for Bartonella/Babesia
- ◆ DNA/PCR ?following challenge

## Testing for Borreliosis

- ◆ **ELISA 2-3 months for antibodies, false negatives**
- ◆ **Western Blot (IgM early, IgG later)**
  - ◆ CDC Criteria:
    - ◆ IgM Positive if 2 of 23-25, 39,41 are present
    - ◆ IgG Positive if 5 of 18, 23-25, 28,30,39,41,45,58,66,83-93 are present
  - ◆ IGeneX (ILADS) Criteria
    - ◆ IgM Positive if 2 or more of 23-25, 31, 34,39,41,83-93 are positive
    - ◆ IgG Positive if 2 or more of 23-25,31,34,39,41,83-93 are positive
- ◆ **PCR/DNA**
  - ◆ Tissue, spinal fluid, blood, urine, synovial fluid
- ◆ **FISH/RNA**
- ◆ **MRI Brain**
  - ◆ Unidentified bright objects (UBO'S), periventricular
  - ◆ Demyelination

# Testing for Bartonellosis & Babesiosis

- ◆ Immunoglobulins
- ◆ RBC Smears
- ◆ Vascular Endothelial Growth Factor(VEGF) for Bartonella

## Testing for Erlichiosis

- ◆ DNA/PCR blood
- ◆ Blood Smear for morulae in WBC's
- ◆ IFA for antibodies after 7-10 days of onset

# Clinical Diagnosis/Treatment

- ◆ CMAJ June 9, 2009 Vol. 80 no. 12
- ◆ The Emergence of Lyme Disease in Canada, N.H. Ogden et al: "The diagnosis should be guided by the patient's clinical situation, with the results of laboratory tests providing supportive evidence of infection"...."when used alone, enzyme-linked immunosorbant assay (ELISA) has limited specificity, but the specificity is improved by Western Blotting"

# Clinical Diagnosis/Treatment

- ◆ Public Health Agency of Canada
- ◆ Lyme Disease Statement ,Feb. 25, 2011
- ◆ "when someone shows symptoms of Lyme disease and might have been exposed to the ticks that carry it, guidelines recommend that physicians treat the illness, even if it has not been confirmed with laboratory testing"

# Clinical Diagnosis/Treatment

- ◆ Exposure , early signs, early treatment
- ◆ Test results
- ◆ Symptoms specific to infection(s)
- ◆ Most likely infection
- ◆ Response to treatment
  - ◆ Jarish-Herxheimer reaction
  - ◆ Improvement
  - ◆ Treat to resolution, then 4-6 wks more

## Borreliosis Treatment

### **Acute**

- ◆ Ampicillin 500mg TID or 1gq8hrs x 3wks plus Probenicid 500mg TID
- ◆ Doxycycline 200mg BID x 3 wks
- ◆ Cefuroxime (Ceftin) 500mg BID x 3wks

### **Chronic**

- ◆ Clarithromycin(Biaxin) 500mg BID
- ◆ Doxycycline 200mg BID
- ◆ Amoxicillin (large doses)
- ◆ Ceftriaxone (Rocephin) I.V.

### **Herbals**

- ◆ Bryan White Formula A-L Complex
- ◆ Grapefruit seed extract

# Borreliosis Treatment (cont'd)

## Chronic

- ◆ Marshall Protocol
- ◆ Gradually activates the innate immune response to minimize Herx reaction

Olmesartan 40mg QID ac for 1 month; if Herxing tolerable, add Minocycline 25mg q48hrs and increase to 100mg q48hrs as tolerated. Gradually increase Olmesartan to 40mg X 6/day. Avoid Vitamin D.

## Bartonellosis Treatment

- **Acute**
  - ◆ Ciprofloxacin (Cipro) 500mg BID
  - ◆ Doxycycline 200mg BID
  - ◆ Gentamycin
  - ◆ Trimethoprim-sulfamethoxazol (Bactrim/Septra)
- **Chronic**
  - ◆ Ciprofloxacin (Cipro) 500mg BID
  - ◆ Levofloxacin (Levaquin) 500mg OD
  - ◆ Rifampin 300mg BID plus Doxycycline 200mg BID (Liver/Sun)
  - ◆ Minocycline 50-100mg BID and Azithromycin 250mg OD x3 then q2days
- **Herbals**
  - ◆ Bryan White Formula A-Bart
  - ◆ Polygonum
  - ◆ Red Root Tincture
  - ◆ Boneset tea

# Babesiosis Treatment

- **Acute and Chronic**
  - Atovaquone (Mepron) 750mg BID or Atovaquone-proguanil(Malarone) 250/100mg OD plus Azithromycin 500mg OD
- **Herbals**
  - Byron White Formula A-Bab
  - Artemesia

# Erlchiosis Treatment

- ◆ Doxycycline
- ◆ Adults 100mg BID
- ◆ Children 2.2mg/kg BID
- ◆ 7-14 days

# Supportive Treatment

- Maintain sleep
- Avoid caffeine and other stimulants
- No alcohol
- No smoking
- Exercises
- Diet high in protein and fiber, low in fat and carbohydrates
- Complimentary treatment

# Supplements

- Acidophilus 20 billion
- Multivitamins /minerals
- B complex 50
- Vitamin C 1g
- Omega 3
- Magnesium 200mg
- Take all supplements twice daily

# Metal Toxicity

- ◆ Toxic metals decrease immune system function
- ◆ Mercury (amalgams, tuna)
- ◆ Lead, Arsenic
- ◆ Cadmium / Antimony from cigarette papers
- ◆ Bismuth (filler in medicines, supplements)
  
- ◆ **Treatment**
  - ◆ Avoidance
  - ◆ Remove amalgams
  - ◆ Chelation
    - ◆ EDTA
    - ◆ DMSA

## Case Presentation 1

- ◆ 1991
- ◆ 62 yr old male
- ◆ Hunting guide in Cape Breton Highlands, NS
- ◆ Tick bite not noticed
- ◆ Bulls eye lesion left upper arm
- ◆ Headache, sweats, joint pain, fatigue
- ◆ ELISA test negative
- ◆ Treated with antibiotics
- ◆ Condition improved



## Case Presentation 2

- ◆ October 17, 2006
- ◆ 24 year old female
- ◆ Presents with history of camping in Antigonish Co. NS, June and July 2006; non endemic area; white tail deer area.
- ◆ Anterior abdominal wall lesion; 3cm diameter; red center with blue/black perimeter, tender to touch
- ◆ ELISA ordered
- ◆ PCR (Health Genetics Center, Humber Regional Hospital, Toronto, ON) ordered
- ◆ October 31, 2006
  - ◆ ELISA reported negative
  - ◆ No further symptoms

## Case Presentation 2 Cont' d

- ◆ November 28, 2006
  - ◆ Complains of anterior chest wall pain, chills, sweats, pressure type headaches
  - ◆ PCR report: urine positive for Borrelia, blood negative; Babesia, Erlichia and Bartonella negative in blood and urine
  - ◆ Started on Biaxin 500mg BID and Flagyl 500mgBID for one month RX2
- ◆ February 12, 2007
  - ◆ Symptoms improving; not resolved; to continue meds.
- ◆ March 16, 2007
  - ◆ Symptoms resolved

# Case of Non Recognition

- 36 year old male
  - Technician working on high speed internet tower in endemic area, Pictou, NS
- July 15, 2010
  - Tick removed from chest, red rash +/-7cm in diameter
- Aug 1,2010
  - Saw doctor in outpatients with severe headache, dizziness, and nausea.
  - Treated with Serc, Maxeran and Toradol with no relief
- Aug 15, 2010
  - Saw family doctor for persistent headache, dizziness, myalgia, muscle weakness, anorexia, decreased concentration and memory. Treated with Amitriptyline 10mg.

## Case of Non Recognition Cont' d

- Aug 24, 2010
  - Saw family doctor again and started on Doxycycline100mg BID
  - MD contacted me on Aug 25, 2010
  - Complaints of fatigue, flushing, anorexia, sleep problems, swollen submandibular glands, tenderness scalp, jaw pain, dysesthesia around mouth, tachycardia, tinnitus and sound sensitivity, blurred vision, floaters, pressure around eyes, nausea, dysesthesia legs, vertigo, dizziness, muscle weakness, headaches (pressure and ice pick), neck pain and stiffness, brain fog, anxiety, irritability, decreased memory, and mood swings
  - Doxycycline increased to 200mg BID with supplements, had Herx reaction with dysesthesia arms and legs, extreme headache, dizziness and malaise

## Case of Non Recognition Cont' d

- Sept 20, 2010
  - ◊ Persistent fatigue, headaches, weakness legs, tinnitus, pressure eyes; but less dizziness, muscle pain, dysesthesia, gland swelling, scalp sensitivity, tachycardia, blurred vision, foot and knee pain, and neck stiffness
  - ◊ To continue Doxycycline 200mg BID, possibly add Rifampin for ?Bartonellosis
  - ◊ Applied and accepted for Workers Compensation benefits
- Sept 21st, 2010
  - ◊ Saw infectious disease doctor. Was told he didn't have Lyme disease; if he did, Doxycycline should have cured it; told he should see neurologist, rheumatologist or possibly psychiatrist.
  - ◊ Report resulted in WCB benefits cancelled

## Case of Non Recognition Cont' d

- Sept 28, 2010
  - ◊ Persistent symptoms, added Rifampin 300mg BID
  - ◊ Had generalized itching and stopped same
- Sept 30, 2010
  - ◊ Symptoms decreasing; to continue Doxycycline 200 BID and add Levaquin 500mg OD
- October 1, 2010
  - ◊ ELISA negative, Bartonella titre 1:64
- October 20, 2010
  - ◊ Continues to gradually improve

## Case of Non Recognition Cont' d

- ◆ November 17, 2010
  - ◆ About 60% overall improvement
- ◆ December 1, 2010
  - ◆ Felt improved enough to stop treatment on his own; most symptoms returned within one week, especially anxiety and depression
  - ◆ Family doctor starts Trazadone HS
- ◆ January 11, 2011
  - ◆ Resumes Doxycycline and Levaquin
- ◆ March 1, 2011
  - ◆ All symptoms resolved; to discontinue medications; follow up as required