FIGHT THE BITE!
OBJECTIVES

1. Review local incidence of West Nile virus and its impact on the community

2. Discuss the neurologic complications associated with West Nile virus

3. Identify the rehabilitation implications with the West Nile virus patient population
West Nile Virus is a virus that can affect the central nervous system, cause a range of minimal to severe illness and can result in death. It is a member of the flavivirus group of viruses, an Arthropod-borne virus (insect-borne), requiring a vector.

- An emerging infectious disease
- Common in Africa, Middle East, Western Asia, Europe
- First isolated in US in 1999

North Dakota Department of Health (2005).
National Institute of Allergy and Infectious Diseases (2009).
HISTORY OF WEST NILE VIRUS

- First isolated in Uganda, 1937
- Linked to meningitis/encephalitis outbreak in Israel in 1957
- Diseased horses noted in France and Egypt in 1960s
- In Western hemisphere, New York City, 1999
- Moved through Eastern to Western U.S. by 2003
- Recently noted in the Caribbean, South America, Mexico

Centers for Disease Control and Prevention (2011).
HOW IS WNV SPREAD?

• Mosquito feeds on infected animal or bird and gets the virus (wild birds are most common reservoir hosts)
• Mosquito gives virus to another animal, or bird, or human while feeding on its blood
• Virus typically cycles between mosquitoes and birds, but it may be transmitted to incidental hosts such as humans and horses, the dead end for the virus
• Mother to child, blood transfusions, organ transplant

SEASONAL PATTERNS OF WNV TRANSMISSION

• Temperate climates
• Highest bird mortality in early spring
• Highest equine mortality in early autumn
• Human cases tend to occur late summer, early autumn
• When mosquitoes die off, so does the transmission

• 48 states reporting WNV in people, birds or mosquitoes
• 2374 cases in people – 51% neuroinvasive
• Highest number of cases reported in 2012
• 114 deaths 2013 (134 in 2012)
• 7% of cases in Texas (CA, CO, NE 2013)
• 40% of cases in Texas 2012

CDC update January 7. 2014
DALLAS COUNTY FUN FACTS

• 329 cases in 2012, but much fewer 2013 - 16
• 11 West Nile Fever
• 5 West Nile Neuroinvasive
• Fewer than Houston, SA or FW
WHO IS AT RISK FOR WNV?

- **Anyone** who lives in an area where West Nile virus has been identified
- **Older** or very young age
- **Solid organ transplant recipients**
- **Immunocompromised** (HIV, DM, chemo)
- **People who spend time outdoors**

YOUR CHANCES.....

• < 1% chance if bitten by infected mosquito
INTERESTING INFORMATION FROM THE CDC JANUARY 7, 2014

• Over 400 blood donors tested positive in 2013
WNV
SYMPTOMS

Mild
• 80% cases: no symptoms at all
• 20% cases:
  • Fever
  • Nausea
  • Vomiting
  • Skin rash
  • Swollen glands
  • Headache
  • Body aches

Severe – “Neuroinvasive”
• <1% cases:
  • High fever
  • Stupor
  • Disorientation
  • Headache
  • Convulsions
  • Numbness
  • Neck stiffness
  • Paralysis
  • Coma

Centers for Disease Control and Prevention (2012).
HOW IS HUMAN WNV DIAGNOSED?

• Clinical symptoms
• Laboratory tests
  – Blood tests (WNV ab, WNV RNA PCR)
  – Lumbar puncture
• CT, MRI, EEG to evaluate abnormalities in the brain

Mayo Clinic (2010).
WNV TREATMENT

- No specific approved pharmaceutical therapy for human use
- Typically mild symptoms improve without treatment
- Supportive care for severe cases:
  - Hospitalization and nursing care
  - Intravenous fluids
  - Respiratory support
  - Prevention of secondary infections
- The trouble with treating WNV……..
NEUROINVASIVE WNV

- Meningitis
- Encephalitis
- Acute flaccid paralysis
WEST NILE NEUROINVASIVE DISEASE IS LIKE A........
SHAMELESS PROMOTION #1

Rehab RN
WEST NILE NEUROINVASIVE DISEASE........

ANYTIME, ANYWHERE, ANYONE

BRAIN INJURIES DO NOT DISCRIMINATE

Bladder & Bowel Support

Brain Injury Association
NEURO ISSUES AS A RESULT OF WNV

- Confusion/Cognitive Issues
- Weakness
- Paralysis /Poliomyelitis
- Seizures
- Tremors
- Impaired coordination
- Dysphagia
OTHER MEDICAL ISSUES AS A RESULT OF WNV

- Fatigue
- Body aches/arthralgia/myalgia
- Neuropathic pain
- Hyponatremia
- Headache
- Malaise
- Anorexia
- Photophobia
LONG-TERM ISSUES AS A RESULT OF WNV

- Chronic Kidney Disease 4-9 years after infection
- Parkinsonian features due to basal ganglia involvement
- Postpolio syndrome (LMN and anterior horn cell involvement)
- Lesson – recovery is variable in looking at all studies, often incomplete recovery
WNV PREVENTION AND CONTROL

- Licensed vaccine for horses
- No approved vaccine yet for human use
- Comprehensive mosquito surveillance
- Disease surveillance
- Source reduction

Centers for Disease Control and Prevention (2012)
National Institute of Allergy and Infectious Diseases (2010)
WNV PREVENTION: REDUCING THE SOURCE OF THE PROBLEM

- Source reduction: activities to decrease or eliminate mosquito breeding
- Local source reduction is extremely important
- Greatest increase in risk is associated with factors that encourage mosquito populations
INDIVIDUAL-LEVEL WNV PREVENTION

– Use DEET-based, picaridin, IR3535, or oil of lemon eucalyptus repellants on skin and clothing
– Wear long sleeves/pants
– Take precautions when mosquitoes are most likely to bite
– Avoid the outdoors at dawn and dusk
– Report dead birds; symptomatic horses
– Protect your home
– Repair screens/windows
– Be aware of who is at higher risk for severe disease

Centers for Disease Control and Prevention (2012).
Texas Department of State Health Services (2013)
PREVENTING WNV IN HORSES

• Number one prevention is to vaccinate
  – Not completely protective
  – Frequency based on risk, age, gestation

• Dusk to dawn: horses in the barn
• Remove muck/manure frequently
• Circulate air with fans
• Mosquito dunks
• Horse-safe topical repellants

• If my community doesn’t spray for mosquitoes, I’m at risk.
  – Not necessarily. The most important controls begin with eliminating risks around your personal outdoor environment
• I should invest in a bunch of bug zappers.
  – No. These actually attract insects, including mosquitoes.
• I’ve heard that putting up a bat house will help, since they eat mosquitoes.
  – No proof exists that bats, purple martins, or any other animals eat enough adult mosquitoes to make a difference – and bats carry rabies and should not become your yard guests.

Texas Department of State Health Services (2014).
OTHER FUN FACTS
SHAMELESS PROMOTION

#2

COMING UP.....
CONCLUSION

- **There is much the individual can do to effectively protect against West Nile.**
- Most people bitten by mosquitoes will not become ill with WNV.
- Most people infected with WNV will have no symptoms or very mild symptoms that do not require treatment.
- If you have WNV neuroinvasive, the best place to receive rehabilitative care is Baylor Institute for Rehabilitation.

Texas Department of State Health Services (2012).
REFERENCES


REFERENCES


REFERENCES


(West Nile maps, prevention information and resources)