West Nile Virus: An Old Tale, New Mystery

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WEST NILE VIRUS: AN OLD TALE, NEW MYSTERY
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CASE

- Elderly male with a past medical history of prostate cancer status-post radiation, myocardial infarction with stents and hypertension presented with a one week history of generalized weakness, decreased appetite and non-productive cough. Vital signs were: Tmp 102.5 F, pulse 77, RR 19, BP 125/65, O2 saturation 96% room air.
- Patient was alert and oriented x3, diminished airflow bi-basilar in nature and diminished lower extremity reflexes. Labs were significant only for serum sodium of 130.
- Over 24 hours, patient had worsening weakness, prominent in the lower extremities with persistent diminished reflexes and non-sustained ventilator tachypnea.
- Progressively unstable vital signs and encephalopathy led to the patient being transferred to ICU and subsequently intubated.
- CT head/neck and thoracic/lumbar MRI were unrevealing for overt pathology. Urinalysis, urinalysis, urinalysis...
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BACKGROUND

- West Nile Virus (WNV), belongs to the Flavivirus family, is considered an endemic disease in many states including Florida.
- In the last decade, the virus has been prominently reported in the Southern and Midwest States.
- The disease is most prevalent during the summer to fall months periods due to elevated temperatures leading to enhanced vector transmission.
- WNV is acquired via the bite of an infected mosquito particularly the Culex species, and is linked to WNV infection with peak incidence and mortality rates are seen among those who are 50 years of age and older, with a reported increase of encephalitis or meningitis variants of the disease.
- Comorbidities such as diabetes, hypertension and other chronic illnesses have not been linked to WNV prevalence and disease outcomes.
- Equines and humans are incidental hosts of WNV and disease transmission from these sources are rare. There are various human risk factors that are associated with WNV.
- Disease prevalence is reported to be equal among the sexes but peak incidence and mortality rates are seen among those who are 50 years of age and older, with a reported increase of encephalitis or meningitis variants of the disease.
- Comorbidities such as diabetes, hypertension and other chronic illnesses have not been linked to WNV prevalence and disease outcomes.

DISCUSSION

- The case is unique in the rarity of disease presentation, as literature review indicates that <1% of patients develop West Nile neuro-invasive disease (WNND), which includes (encephalitis and/or myelitis), resulting in long-term neurological deficits.
- WNND can present with normal imaging studies, CSF pleocytosis, persistent weakness and cognitive deficits that require long-term management.
- The most validated test for diagnosing WNV is IgM Antibody detection by ELISA of serum of CSF within a time period of eight to twenty one days after symptom onset with a reported sensitivity of 95%.
- There are no current treatment regimens that offer complete disease eradication but there are vaccines in development.
- One such is HydroVax-001 WNV which has been shown promising outcomes with in vitro/in vivo studies to produce significant neutralizing antibody response against WNV.
- WNV is an important cause of viral encephalitis epidemic in the country and has been well recognized as an established seasonal epidemic.
- It is critical for Family Physicians across the nation, especially for those practicing in endemic areas, to include WNV in the differential disease panel for patients in the primary care setting, presenting with vague symptoms and undifferentiated/unexplained weakness and symptoms.

REFERENCES

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7. http://www.westnile.ca.gov/wnv_faq_basics.php - Figure 1
8. https://commons.wikimedia.org/wiki/File:MRI_T2_Brain_axial_image.jpg - Figure 2

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Figure 2: T2 weighted MRI image will indicate High Signal Intensity and Swelling in the Thalamus in patients with West Nile Virus Encephalitis. Hemorrhage may also be noted in this area on occasion.

Classic MRI findings include:
2. Restricted diffusion in the Basal Ganglia and Thalamus

FUTURE DIRECTION / CONCLUSION

- Strategies can be adopted by family practice focused on improving patient learning on prevention techniques such as using DEET containing repellents and outdoor protection with appropriate attire.
- Education on symptom recognition is crucial with severe manifestations including convulsions, weakness and paralysis or mild effects of nausea, vomiting and myalgia.
- It is also important to note that a vast majority of patients may be asymptomatic in the initial stages of infection, with no discernable diagnostic test to determine if a person may develop disease manifestation.

West Nile Virus Transmission Cycle

![Figure 1](https://commons.wikimedia.org/wiki/File:MRI_T2_Brain_axial_image.jpg)

Figure 1: West Nile Virus Transmission Cycle

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