


West Nile virus in a patient with Good's syndrome

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Abstract

We describe the association between thymoma and hypogammaglobulinemia (Good's Syndrome) and a fulminant, seronegative West Nile Virus neuroinvasive infection confirmed by nucleic acid amplification. Diagnostic difficulties are emphasized and historical minutiae are highlighted.

INTRODUCTION

Good's syndrome, described 60 years ago by Dr Robert Good is the association between thymoma and hypogammaglobulinemia. Principle manifestations encompass infections and autoimmune disease. Infections are usually sino-pulmonary with bronchiectasis seen radiologically in 45%, and autoimmunity in 26%, commonly pure red cell aplasia, hypothyroidism, inflammatory arthritis, myasthenia gravis and systemic lupus erythematosus [6, 7, 8]. West Nile Virus (WNV) is now one of the most common causes of epidemic arbovirus encephalomyelitis and in this case report we describe the association of these two illnesses and pitfalls in diagnosis [2, 5].

CASE REPORT

A 58-year-old Mexican male presented in late fall with right arm weakness, fevers to 104 F, head and body aches. Although fluent in English, he became confused and lapsed into his native Spanish when speaking to his coworkers. He consulted his primary care physician who prescribed amoxicillin which was followed by a rash. Confusion and right arm weakness progressed, prompting hospital admission.

Prior medical history was notable for a mediastinal mass, found to be a thymoma on biopsy, for which excision was recommended but deferred by patient. He was an avid outdoorsman and his dog had become ill during the same period with a paralytic illness involving her hindquarters after chewing an unidentified dead animal while accompanying him on a hunt.

Examination revealed an ill appearing middle aged man with a fever of 101.4, a tachycardia of 112 and a blood pressure of 188/98. He was confused, without

meningism and had a diffuse macular papular rash sparing his palms and soles. The rest of his general examination was normal.

Neurological examination showed fluent speech, normal alertness but confusion for current events and intact cranial nerves. He had a flaccid monoplegia of his right arm with absent reflexes, prominent fasciculations in his triceps with no distal wasting. Sensation to touch was preserved. Strength and sensation were normal in his other limbs, although his patella and ankle reflexes were diminished. He had a negative Hoffman reflex and a flexor plantar response. The patient rapidly worsened over the next 24 h, becoming weaker and areflexic, mandating endotracheal intubation for diminishing vital capacity and airway protection.

A complete blood count, comprehensive metabolic panel and blood cultures were normal. Serologies for syphilis, human immunodeficiency virus, paraneoplastic antibodies, anti-nuclear antibodies and acetyl cholinesterase receptor antibodies were negative. His serum immunoglobulin M was undetectable and immunoglobulin G was 317 mg/dl (N 700–1400) in keeping with severe immunodeficiency. Lumbar puncture disclosed a lymphocytic pleocytosis of 60 cells with normal protein and glucose. Cerebrospinal fluid culture (CSF) was negative and West Nile IgG and IgM antibodies were negative. Nucleic acid amplification of the CSF was positive for WNV. Computed tomography of the chest redemonstrated his 3 by 4 cm anterior mediastinal mass, without lymphadenopathy or invasion.

The patient's subsequent clinical course was relentlessly downhill. He became more unresponsive, developed a flaccid quadriplegia and did not respond to empiric intra venous gamma globulin (IVIG). In addition to IVIG, a course of steroids also did not alter the

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clinical decline. Three weeks into his hospitalization, he was made comfort care and died after terminal extubation.

DISCUSSION

WNV is rapidly becoming a global enzootic which might be related to global warming. The transmission cycle is usually bird-mosquito-bird with humans being an incidental host. Human disease is generally subclinical but overt disease occurs in about 1% of those infected symptoms of WNV consist of a viral prodrome with fever, headache, myalgias and a rash. Mortality in WNV is usually confined to neuroinvasive disease (myelitis, meningitis and encephalitis), and approaches up to 35% in those older than 75 years [1, 2]. Serum and CSF serology for WNV IgM remain the gold standard for diagnosis as viremia has usually resolved at the time of symptom onset [3, 4]. CSF viremia is short lived and we speculate was more prolonged in our patient related to his immunodeficiency [8].

Good's syndrome likely contributed to our patient's adverse outcome and diagnostic delay. B-lymphocytes, IgG and induced-IgM have been shown to defend against disseminated WNV infection. In one study, the absence of secreted IgM in response to WNV resulted in 100% lethality demonstrating the essential component of humoral immunity in response to WNV [4].

We believe our case report brings into question the serological diagnosis, or lack thereof, when the patient is immunosuppressed. Considering nucleic acid amplification while not usually the first line diagnostic strategy for many infectious diseases, is imperative when antibody production is impaired. Finally, it must be stressed that a 'Good' history is paramount which in our case must include not only man, but his best friend, his dog.

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CONFLICT OF INTEREST

The authors claim no conflict of interests.

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ETHICAL APPROVAL

All treatments performed in studies involving human participants were done in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

CONSENT

Written consent for this manuscript obtained from patient's wife.

GUARANTOR

Dr Spencer O Moen MD is acting as guarantor for this manuscript.

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