

Introduction and Aims

Recently, infections by West Nile Virus (WNV), a single-strand-RNA arbovirus in the family Flaviviridae, have emerged as a public health problem in Europe and in particular in Northern-Italy (1). In most cases WNV infection is not symptomatic, but neurological manifestations, like meningoencephalitis and seizures, have been described in up to 25% of cases. Here we describe the first series of two cases of WNV-related cerebrovascular diseases (CDs).

Case 1

A 46 year old female was admitted to our Stroke Unit with headache, fever and an impaired level of consciousness. She had a personal history of rheumatoid arthritis, diabetes, dyslipidemia and chronic lymphocytic leukemia (in full pharmacological control). We found WNV-RNA copies in CSF by PCR, in blood and urine tests. EEG showed paroxysmal alterations on fronto-temporal right lobe. Autoimmune, neoplastic and thrombophilic screening was negative. Neuroimaging is showed in figure 1.

We started antivirals, antibiotics, IgIV therapy and AED with a progressive improvement of neurological conditions. The thrombosis of left transverse-sigmoid sinuses and jugular vein that we treated with anticoagulant therapy. At 3-months follow up we observed full resolution of neurological disturbances and MRA was negative.

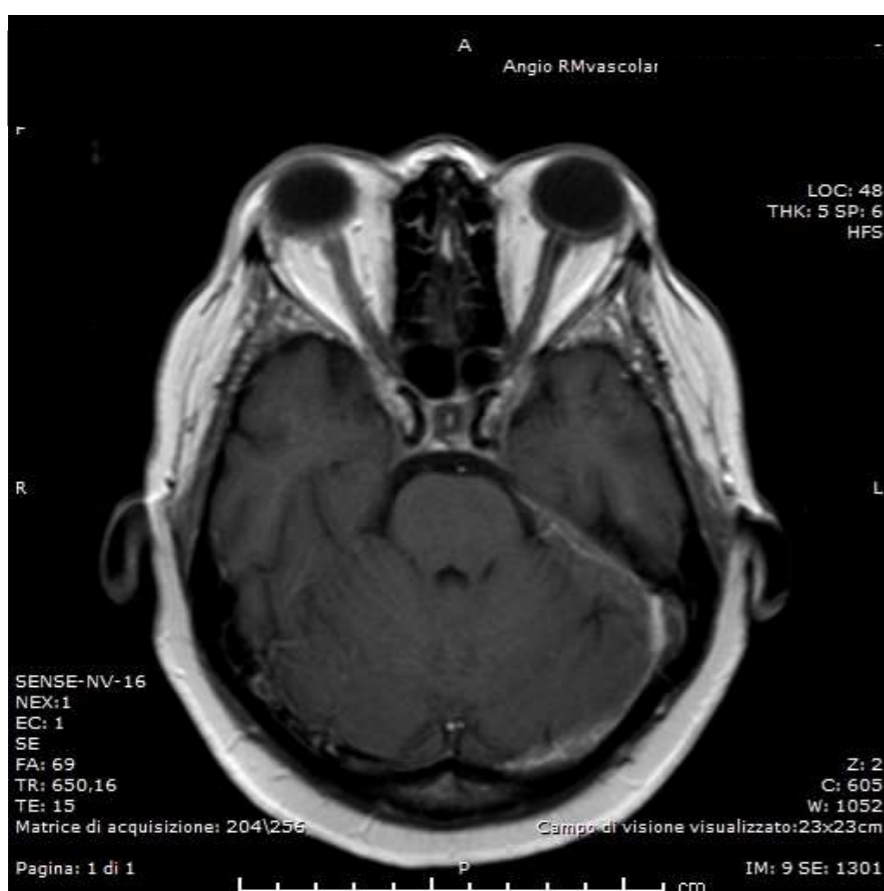


Figure 1: thrombosis of left transverse-sigmoid sinuses and jugular vein

Case 2

A 76 year-old-male, with a personal history of arterial hypertension, diabetes mellitus, dyslipidemia and ischemic cardiopathy presented transient diplopia, gait instability and right paraesthesia after ten days of fever. Subsequently he showed transient dysarthria and right hemiparesis. Due to persistency of high fever, a diagnosis of encephalitis was suspected and confirmed by CSF analysis (pleyocytosis, hypoglycorracchia and hyperprotidoracchia with WNV test positivitiy). EEG, Cerebral Computed-Tomography (CT) and Angio-CT did not show acute pathological findings. Despite specific antiviral treatment, the next week he presented with a severe and unsolved left middle cerebral artery (MCA) syndrome (neuroimaging in figure 2). The search of any emboligenic or thrombotic sources was negative. As a result of the occurrence of pneumonia, urinary tract infections and his previous conditions, the clinical course of the patient worsened resulting in death in few weeks.

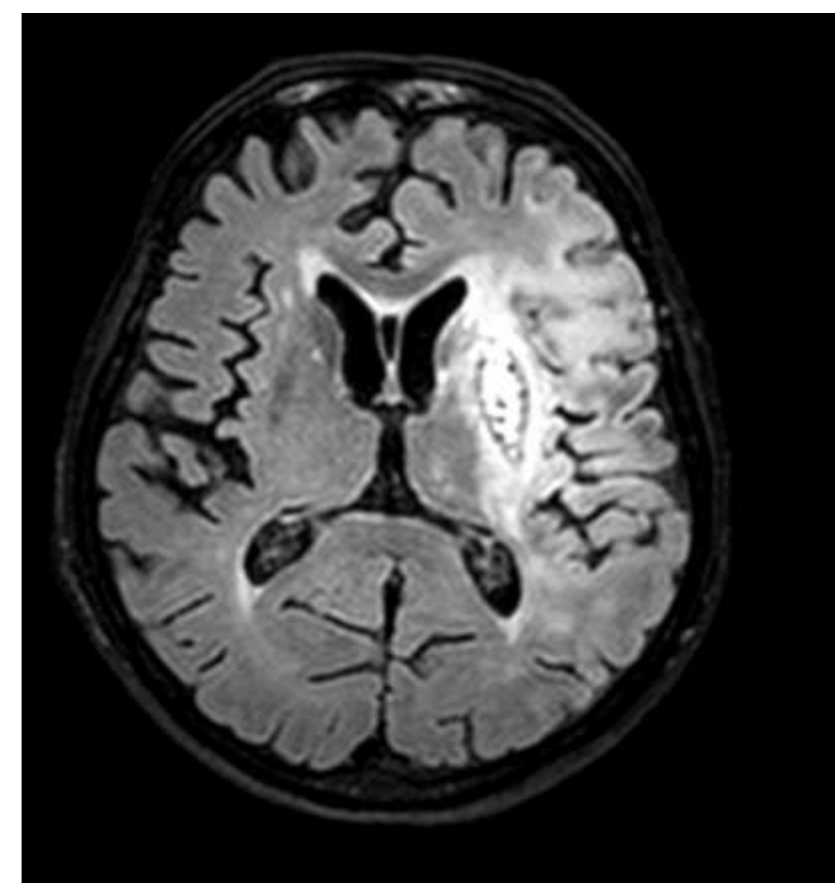


Figure 2: extensive ischemia (fronto-temporo-parieto-insular) in left MCA territory with hemorrhagic infarction.

Discussion and Conclusions

CDs represent a great burden for national health service and infections could lead to onset of ischaemic stroke (IS) and intracerebral hemorrhage (ICH) and CVT. The most described infectious causes of stroke are bacterial (pneumococcal meningitis, bacterial endocarditis, Helicobacter pylori, Chlamydia pneumoniae, Mycoplasma pneumoniae, Haemophilus influenzae) and viral (HSV, HCV, HIV, EBV, CMV) infections (3). Moreover several cases of CV events associated to other flavivirus (mainly Dengue-Virus) have been reported, but just one case of IS and no cases of CVT have been described in patients with recent WNV infection. (4) Pathogenesis assumed in these cases seems to be linked to both vessel damage, inflammatory/vasculitic mechanisms and coagulation alterations (thrombocytopenia and prolonged clotting time for ICHs, a transient pro-thrombotic state infection-linked in case of IS and CVT) (5, 6, 7); furthermore, severe dehydration associated with infection could be a predisposing condition, in particular for CVT.

In our two cases, events occurring during the acute phases of WNV infection suggesting a trigger role of WNV for IS and CVT.

Moreover we have observed cerebral hemorrhagic complications in both patients, revealing complex alterations in coagulation patterns, not just on the prothrombotic side, induced by WNV.

In conclusion, considering the increasing burden of CDs in the world and the possible viral vasculitic and dyscoagulative effects, it is crucial to prevent WNV infection spread and to focus on early identifications of possible life-threatening complications.

References

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3. Alexander JJ et al. Stroke Associated With Central Nervous System Vasculitis After West Nile Virus Infection *J Child Neurol* 2006;21:623625.
4. Verma R et al. Dengue infection presenting as ischemic stroke: an uncommon neurological manifestation. *Neurol. India* 61,317318,