

Cranial Nerve Palsies Associated with Influenza B

Jennifer A. McCombe, Marc J. Narayansingh, Jack H. Jhamandas

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Influenza B is a relatively common cause of influenza worldwide. Despite this, the recognition of neurological complications is very low. We report a case of isolated third and fourth cranial nerve palsies associated with influenza B infection, and to our knowledge, this is the first such reported case.

CASE REPORT

The patient is a 42-year-old man who presented to the emergency department with a one day history of diplopia, left eyelid droopiness and headache, preceded by a two day history of cough, coryza, myalgias, and fever. He described the headache as dull in quality, moderate in severity, and localized behind his left eye. There was no alteration in level of consciousness and no other focal neurological symptoms. He was an otherwise healthy man and was on no medications. He denied any risk factors for HIV. He had recently travelled to South Africa four months previously where he spent two weeks hunting in remote areas of the country.

Initial examination revealed he was febrile with a temperature of 39.3° C, was tachycardic with a heart rate of 120 BPM and normotensive. Chest was clear on auscultation and there was no lymphadenopathy. He was not encephalopathic and had no nuchal rigidity. He had marked left eye ptosis but no evidence of conjunctival injection, edema, or discharge. His pupils were asymmetrical, the left being significantly larger than the right, although both were reactive to light. On primary gaze, he had an exotropia of his left eye. On extraocular movement testing, his left eye would abduct with left gaze but would not reach midline with right gaze. There were no discernible vertical eye movements noted in his left eye. There was no intortion noted in his left eye on attempted downgaze. Eye movements were full in his right eye. There was no sensory disturbance to his face. The remainder of his neurological exam was normal. We considered his findings to be consistent with complete left third and fourth nerve palsies.

Initial laboratory investigations revealed no abnormalities other than a moderately low lymphocyte count at 0.5×10^9 cells/L. Magnetic resonance image of the brain with gadolinium enhancement and 3D time of flight MRA were normal. The CSF studies were normal with a WBC count of 1×10^6 cells/L, a RBC count of 2×10^6 cells/L, protein of 0.28 g/L and glucose of 3.7 mmol/L. A nasopharyngeal swab (direct fluorescent antibody) was positive for influenza B and negative for influenza A, parainfluenza and RSV. Acute and convalescent influenza serologies were not obtained. Treatment with oral oseltamivir was initiated.

Further investigations revealed negative HIV, Hepatitis A, B and C, and syphilis serologies. Smear for malaria was negative. Quantitative immunoglobulins were normal. ANA, TSH, CK, and fasting glucose were all normal. Anti-GQ1b ganglioside antibody testing was negative. CSF was negative for cryptococcal antigen and AFB, as well as PCR for HSV, VZV, and enterovirus. CSF PCR for influenza A and B were also negative.

After 48 hours in hospital his systemic symptoms were improving as was his range of ocular motility in his left eye (Figure A). Two days later, his systemic symptoms had nearly resolved and his ocular motility was continuing to improve (Figure B). At a follow-up visit four weeks after his initial presentation, ocular motility was normal in both eyes.

DISCUSSION

Influenza has been associated with an array of neurological manifestations, with an increased prevalence among children¹. Seizures, in most cases febrile seizures, are the commonest CNS manifestation found with influenza B infection². Encephalitis is another reported sequelae of infection with influenza A and, to a lesser extent, influenza B³. More severe manifestations include an acute necrotizing encephalopathy, associated with bilateral thalamic lesions⁴, and Reye's syndrome, a post-infectious encephalopathy associated with salicylate use².

Cranial nerve involvement is rare in association with influenza infection. A case of isolated hypoglossal palsy following immunization with bivalent killed influenza (A and B) has been reported in the literature⁵. Furthermore, there have been three cases of impaired ocular movements associated with influenza A infection^{6,7}. The first case involved a three-year-old female who developed bilateral ptosis and was found to have elevated influenza A antibodies suggestive of infection. All other neurological tests were normal and her symptoms resolved within ten days of onset. The second case was in a ten-year-old female who developed extraocular muscle weakness in association with lower leg paresis, again in the setting of

From the Division of Neurology, Department of Medicine, University of Alberta, Edmonton, Alberta, Canada.

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Correspondence to: Jennifer A. McCombe, University of Alberta, 304-10046-110 Street, Edmonton, Alberta, T5K 2Y2, Canada.

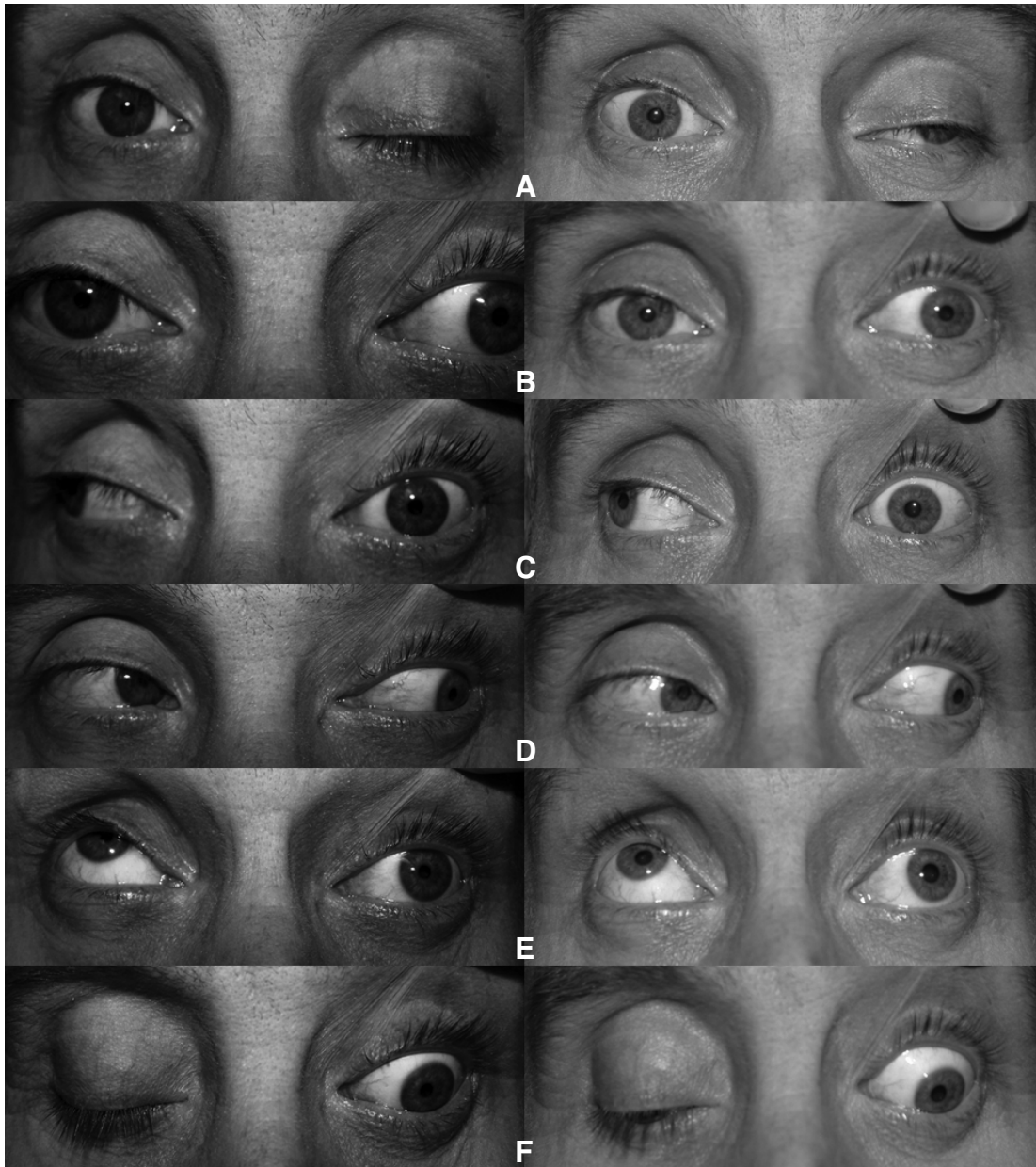


Figure: A,B) Primary Gaze, C) Gaze Right, D) Gaze Left, E) Gaze Up, F) Gaze Down.

elevated influenza A antibodies. The CSF studies revealed a profile that was consistent with a diagnosis of Guillain-Barré syndrome⁶. The third case was in five-year-old boy who developed ptosis and paresis of the superior rectus muscle on the right side, in association with a positive influenza A complement binding reaction. A CT scan of the head and CSF studies were unremarkable. The palsy resolved over the following months⁷. Oculomotor palsies have been identified with varicella-zoster virus⁸ and Epstein-Barr virus infection⁹. No cases of cranial nerve palsies have been reported in association with influenza B infection.

On presentation, the patient described herein, although not encephalopathic, appeared quite ill and given the combination of focal cranial nerve findings in addition to fever, we were concerned about an infectious meningeal process. On examination, there was no evidence of intorsion of the left eye on attempted downgaze, suggesting the presence of a fourth combined with a third nerve palsy, and so cavernous sinus pathology was also considered in the differential diagnosis. An MRI was promptly performed to exclude a cavernous sinus lesion, as well as identifying any brainstem pathology or

enhancement of the third and fourth cranial nerves; none of these abnormalities were observed. CSF studies were also completed confirming the absence of meningeal infection or inflammation; albumino-cytologic dissociation which would have been suggestive of a parainfectious polycranioradiculopathy was also absent.

Cerebrospinal fluid (CSF) PCR for influenza A and B was negative, as outlined above. These studies are not validated in our centre and so the implication of such results is limited. In another study there was a single patient who presented with a more diffuse encephalopathic picture in the context of acute influenza B infection and in this case the PCR was also negative¹⁰. In addition to the negative PCR result, a further limitation of our study is the lack of acute and convalescent influenza B serologies. Despite this, we believe that the clinical and paraclinical features of this case, exclusion of other potential causes, as well as resolution of the deficits concomitant with the resolution of the illness, all support the diagnosis of influenza B.

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