

## **Klebsiella Pneumoniae Meningitis Associated With Acute Vasculitis And Stroke**

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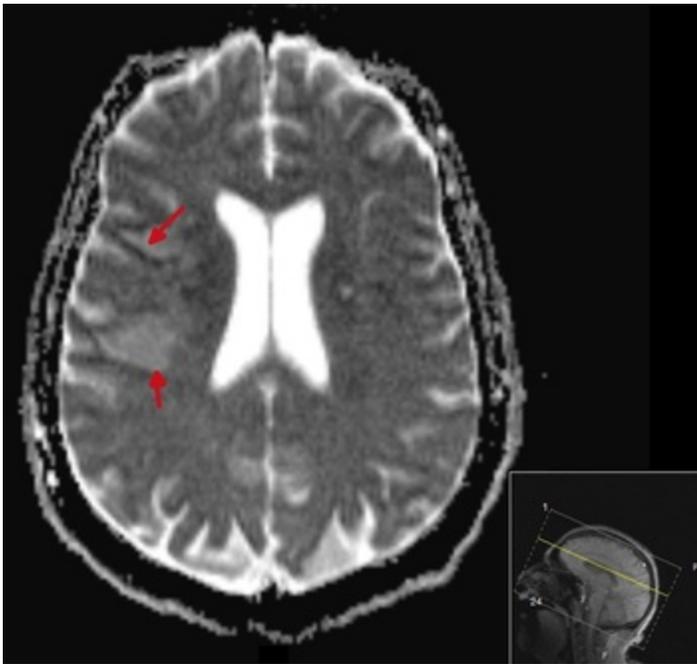
**Introduction** Klebsiella pneumoniae is an uncommon cause of meningitis—most cases are associated with nosocomial infection. In the United States and Europe, an estimated 8% of nosocomial bacterial infections can be attributed to K. pneumoniae, and predominantly manifest as urinary and respiratory tract infections. From past reports, gram negative bacilli made up only 3% of community acquired meningitis cases, although higher rates are described in Southeast Asia. We report a case of meningitis due to community-acquired Klebsiella with a rare stroke-like presentation secondary to meningitis-associated vasculitis.

**Case Report** A 57 year-old man with diabetes mellitus and hypertension presented with confusion, fever, and left-sided hemiplegia for the preceding four days. He was obtunded and intubated. Lumbar puncture yielded cerebrospinal fluid (CSF) with a white blood cell count of 53,600cells/mm<sup>3</sup> with 95% neutrophils, glucose <1mg/dL and protein of 474.3mg/dL. The patient was started on vancomycin, ceftriaxone and dexamethasone. CSF gram stain was significant for gram negative bacilli that speciated to Klebsiella pneumoniae and dexamethasone was discontinued. Magnetic resonance imaging was performed, which showed arteritis of the right middle cerebral artery, bilateral ventriculitis and acute infarction of the right cerebellar hemisphere.

By hospital day (HD) two, the patient demonstrated improved strength in his left upper and lower extremities. On HD 3 patient's left sided weakness returned and his mental status worsened. Steroids were restarted—again with improvement within 12 hours. Extensive evaluation for a source of Klebsiella, including abdominal imaging, cultures of urine and blood and echocardiography yielded no findings outside the central nervous system. In addition, other causes of vasculitis were not found. Treatment included a 21-day course of ceftriaxone and a tapered 14-day course of steroids. Minimal residual left-sided motor deficit remained and patient was transferred to the rehabilitation service.

**Discussion** Review of the literature confirmed the rarity of community acquired Klebsiella meningitis with no significant prior healthcare exposure. Age and underlying diabetes mellitus are predisposing factors in this patient. Steroid-responsive neurological findings consistent with vasculitis further added to the novelty of our patient's presentation. Klebsiella meningitis animal models have demonstrated increased synthesis of pro-inflammatory markers such as, TNF- $\alpha$ , IL-1 and IL-6 with subsequent neurological and cognitive deficits. This patient's Klebsiella isolate had hypermucoviscous characteristics similar to those described in case series from Southeast Asia, mainly Taiwan. Steroids in the management of Klebsiella meningitis has not been previously described given the rarity of this clinical syndrome.

Figure 1



MRI Apparent Diffusion Coefficient (ADC) image of the brain demonstrating low diffusion in the right frontal lobe and insular cortex (arrows) consistent with inflammation and recent ischemia

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