Hypervirulent, Regulator of Mucoid Phenotype A Positive
*Klebsiella pneumoniae* Liver Abscess

Sir,

A 61-year-old male patient presented with three months history of intermittent high-grade fever, right upper quadrant pain, and dry cough. Two weeks before, he also developed severe pain in the left hip. He was diagnosed to have diabetes mellitus 6 months earlier for which he was not on treatment. His total leukocyte
count was 8500/cumm. His random blood sugar was 562 mg/dl and glycated hemoglobin was 16.6%. Computed tomography scan of the abdomen revealed multiple hypodense lesions in the liver suggestive of abscesses [Figure 1]. His blood culture grew Klebsiella pneumoniae sensitive to amikacin, meropenem, gentamicin, piperacillin-tazobactam, and ciprofloxacin. The bone scan revealed uptake in the left femur suggestive of osteomyelitis. He was treated initially with piperacillin-tazobactam followed by levofloxacin for 6 weeks with which he improved well. String test, the phenotypic test for hypervirucosive type of K. pneumoniae, was positive. The K. pneumoniae isolate was characterized for virulence determinants, which included mucoviscosity-associated gene A (magA), regulator of mucoid phenotype A (rmpA) and rmpA2 genes.[1] Polymerase chain reaction was performed for these genes with primers as previously described in literature. The amplified products were sequenced (ABI Prism 3100 Genetic Analyzer - Applied Biosystems) and confirmed. The GenBank sequence accessions numbers obtained for magA, rmpA, and rmpA2 are KU761257, KU761255, and KU761256, respectively. Multilocus sequence typing (MLST) was performed with seven genes (gapA, infB, mdh, pgi, phoE, rpoB, and tonB) with primers as described by Diancourt et al. [2] The sequence type was determined as ST23 using the MLST database for K. pneumoniae at www.pasteur.fr/mlst/Kpneumoniae.html.

K. pneumoniae is frequently associated with infections in patients with impaired host defenses like diabetes mellitus. A distinctive, invasive community-acquired K. pneumoniae syndrome with systemic abscess formation, and high fatality has been increasingly reported in the recent decades. Majority of these patients present with a clinical syndrome of a pyogenic liver abscess, with fever, leukocytosis, and upper quadrant abdominal pain. Most of the reports are from the South East Asian countries and the mortality ranges between 11% and 31%.[3] The high invasiveness of these isolates is related to the enhanced production of extracellular polysaccharides resulting in extreme “stickiness” noticed in agar plate growths. This is related to two genes: the magA and the rmpA and its variant rmpA2.[3]

Although string test is a sensitive semiquantitative phenotypic test, which can be employed in all laboratories to screen for hypervirulent strains, it lacks specificity.[4] The magA gene is reported to be associated with string test and also with the capsular type K1 in K. pneumoniae. The products of rmpA and rmpA2 bind to the regulatory regions of capsular genes and thereby upregulate capsule synthesis.

Hypervirulent K. pneumoniae strains are often susceptible to most of the antibiotics including ciprofloxacin, third and fourth generation cephalosporins, and carbapenems. A recent report of carbapenem resistance in hypervirulent K. pneumoniae isolates from China is particularly concerning in the Indian setting.[3] In summary, we report, to our knowledge, the first patient with a hypervirulent K. pneumoniae syndrome from India. Increased awareness about this condition would help in earlier diagnosis and appropriate treatment.

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Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

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