Reviewer's report

Title: Unilateral phrenic nerve lesion in Lyme neuroborreliosis

Version: 1 Date: 7 September 2012

Reviewer: Tim Counihan

Reviewer's report:

The authors describe a case of diaphragmatic involvement in Lyme neuroborreliosis (LNB). The report is clearly written and well referenced. The observation, while not unique, is a useful reminder to clinicians to be aware of this treatable disorder.

Major Compulsory Revisions:

1. The diagnosis of acute Lyme as being causally related to the diaphragmatic dysfunction is not fully established. Certainly the patient developed a clinical syndrome and had an aseptic meningitis consistent with acute LNB, It is also recognised that the serological confirmation of acute LNB is challenging. But the authors need to acknowledge these short-comings:
   (i) The antibody index is IgG positive (ratio >1.5), but not the IgM (ratio 0.8).
   (ii) IgM antibodies were not detected in the CSF.
   (iii) BB PCR was negative
   (iv) Was CSF CLCX13 examined?
   (v) Despite 2 weeks of iv cefalosporin treatment which resulted in clinical improvement in other neurological symptoms, the diaphragmatic weakness persisted, even after a further course of oral doxycycline. This all suggests that the LNB may not be entirely responsible for the diaphragmatic dysfunction. The serology suggests exposure to Lyme but does not in my opinion confirm acute infection. The authors should address these concerns.

2. The authors explanation axonal damage is responsible for the delayed phrenic nerve recovery is speculative and not convincing. Lyme-induced neuropathy is considered to be a direct perineuritic infiltration, and response to antibiotics is typically brisk.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests