Epidemiology of Neurocysticercosis at Stony Brook University Hospital, Long Island, NY

Amy Spallone, MD1, Robert Chow, MD1, Luboslav Woroch, DO2, Keith Sweeney, MD3, Luis A. Marcos, MD, FAPC, MPH
1. Department of Medicine, Division of Infectious Diseases, Stony Brook University Hospital, Stony Brook, NY
2. Department of Radiology, Stony Brook University Hospital, Stony Brook, NY
3. Department of Pathology, Stony Brook University Hospital, Stony Brook, NY

BACKGROUND

• Neurocysticercosis (NCC) is an infection with the larval pork tapeworm Taenia solium, which is acquired through a fecal-oral route. 1,4,8
• It is the most common cause of preventable, acquired neurologic disease, as well as the leading cause of new-onset seizures among low-income adults in developing countries. 1,4,6,7
• NCC is endemic in Latin America, Asia, sub-Saharan Africa, and parts of Oceania. 1,4,6,9
• Prevalence of NCC is poorly understood in the US as only half of cases diagnosed by CT are seropositive. 1,4,10
• In the US, NCC is considered a neglected parasitic infection of poverty, affecting primarily Hispanic populations, where poverty reaches greater than 20%. 1,4,11
• NCC has emerged as an important infection in the US due to rising immigration from endemic regions and as a target for public health action. 1,6,8,9,11
• It is estimated that the US health care system spent nearly one-billion dollars in the last decade on hospitalizations due to NCC. 1,11

PURPOSE

1. Evaluate the presence of taeniasis and NCC among individuals who received care at Stony Brook University Hospital from 2005-2015
2. Describe, for the first time, the prevalence of NCC on Long Island
3. Attempt to quantify the burden of disease among Long Island’s immigrant population
4. Emphasize the lack of systematic screening for NCC among close contacts of NCC patients
5. Highlight NCC as a growing clinical and public health issues that requires better reporting and surveillance

METHODS

• A retrospective medical chart review was performed from 2005-2015 using ICD-9 and ICD-10 codes for “NCC,” “cysticercosis,” and “taeniasis” at Stony Brook University Hospital. Data collected included demographics, medical history, laboratory results, imaging, treatment, and outcomes.

Diagnostic Criteria for NCC

TABLE 1

<table>
<thead>
<tr>
<th>Diagnostic criteria</th>
<th>NCC prevalence</th>
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<tr>
<td>Definitive diagnosis:</td>
<td>Probable diagnosis:</td>
</tr>
<tr>
<td>1 absolute criterion</td>
<td>1 major + 2 minor criteria</td>
</tr>
<tr>
<td>2 major + 1 minor + 1 epidemiological criteria</td>
<td>1 major + 1 minor + 1 epidemiological criteria</td>
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<td>3 minor + 1 epidemiological criteria</td>
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RESULTS

• We identified 44 patients with NCC (11 definite, 13 probable).
  • The median age was 30.5 years (range: 4-94), male to female ratio 1.3:1. Figure 1
  • Parenchymal cysts were found in 39 (88.6%) patient, 11 (25%) had extraparenchymal cysts. Image 3 & 4, and nearly 40% presented with seizures.
  • Nearly one-quarter of patients resided in a zip code where the Hispanic community accounts for 65% of the local populace. Figure 3
  • Country of origin was available for 29 patients; the majority (69%) emigrated from Central America. Figure 4
  • Serologic evidence of T. solium was found in 8 patients, 4 had positive CNS anticyticercal antibodies, and 7 showed resolution of an intracranial cyst after cysticidal drug therapy.
  • Approximately 40% of patients were uninsured in this study. Figure 2
  • No taeniasis or deaths were reported during our study period.

CONCLUSIONS

• As the first epidemiologic study of NCC on LI, we conclude that NCC has emerged as an important parasitic infection, primarily among communities with higher numbers of Hispanic immigrants.
  • Our patient population was predominantly young, healthy males who would have sought medical care if not for complications of NCC.
  • We recognize NCC as an important cause of morbidity among Central and South American immigrants, a rapidly growing demographic in LI.
  • There is an urgent need for early, targeted screening practices in order to achieve prompt treatment and prevention of significant, life altering neurologic sequelae.