Disseminated Strongyloidiasis and Meningitis: 40-year Experience at a Japanese Academic Medical Center

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Introduction

Strongyloides stercoralis is a nematode, whose prevalence rate is estimated to be 10-40% worldwide, mainly in the Tropics. Although the development of ivermectin increased its survival rate, the mortality was reported to be up to 87% with disseminated strongyloidiasis (DS), when complicated by sepsis, pneumonia, or bacterial meningitis. The study aim was to determine clinical features of DS and bacterial meningitis.

Methods

We reviewed the charts of patients diagnosed with strongyloidiasis and meningitis from 1975 to 2015 at Okinawa Chubu Hospital, the largest teaching hospital in a strongyloidiasis-endemic area in Japan. Patients with concurrent diagnoses of bacterial meningitis and strongyloidiasis (defined as larvae detected from stool, sputum, cerebrospinal fluid (CSF), ascites, gastric juice, or urine) were eligible.

Results

Of 71 cases, 27 were CSF-culture positive (CP); 44 negative (CN). All CN cases exhibited one of the following characteristics of bacterial meningitis: a purulent CSF, and a positive Gram stain result. 31.9% (CP) and 36.4% (CN) cases were associated with systemic strongyloidiasis, defined as the finding of larvae from at least two distinct sites. Mortality was 29.6% (CP) and 20.5% (CN), respectively. Patient characteristics and CSF analysis were similar in both groups. Sepsis was confirmed in 35.6% (CP) and 20.5% (CN) cases, respectively.

Conclusion

- Meningitis associated with DS was characterized by its causative enteric organisms. Also, the prevalence of purulent, CN cases was higher than previous reports (Driss, el al., 1990).
- Atypical characteristics for community-acquired bacterial meningitis were suggestive of late dissemination in our population. (Kishaba. The Infection. 1982)

Clinical Implications

- Latent
  - Blood
  - Sepsis
- Definite
  - Dissemination
    - Central nervous system
      - Strongyloides
        - Culture (-)
    - Pulmonary
      - Bacterial pneumonia

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<tr>
<th>Age</th>
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<td>Blood</td>
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<td>Culture Positive Cases (CP) (n=27)</td>
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Association between Meningitis/Sepsis/Pneumonia

- Bacterial Pneumonia
  - Sepsis
    - CN (n=44) CP (n=27)
    - Table 1A/B: Description of patients. Red cells indicate fatality, culture positivity, and positive symptoms. Green cells show survival, negative cultures/symptoms. Gray cells are missing data. AMS: altered mental status.
    - Table 2: Summary of included patients. Symptoms of one patient are missing.

Table 1C: Association between Meningitis/Sepsis/Pneumonia