Magnetic Resonance Images in Rhombencephalitis Due to *Listeria monocytogenes* Mimicking Wernicke Encephalopathy

Keisuke Suzuki¹, Yoshiteru Takiguchi¹, Shiho Suzuki², Koichi Hirata² and Toshihiko Inukai¹

Key words: rhombencephalitis, *Listeria monocytogenes*, Wernicke encephalopathy

(Inter Med 47: 817-818, 2008)

(DOI: 10.2169/internalmedicine.47.0894)

Figure 1. Fluid-attenuated inversion recovery (FLAIR) images of the brain (TR: 8,000 msec, TE: 120 msec) show symmetric high signal intensity in the rostral midbrain on day 10 (A, C). Hydrocephalus and periventricular high intensities are also evident. On day 17, FLAIR images show markedly reduced high signal intensity in the midbrain except for the periaqueductal gray matter (B, D).

¹Department of Internal Medicine, Dokkyo Medical University Koshigaya Hospital, Koshigaya and ²Department of Neurology, Dokkyo Medical University, Tochigi

Received for publication January 7, 2008; Accepted for publication January 15, 2008

Correspondence to Dr. Keisuke Suzuki, keisuke@dokkyomed.ac.jp

A 46-year-old woman developed deep coma of sudden-onset preceded by 2 days of high fever ($>40^{\circ}\text{C}$) without headache. She had ulcerative colitis for 17 years which had been under control with 25 mg/day prednisolone and 25 mg/day azathioprine for 2 years. On admission, blood pressure was 118/70 mmHg, and body temperature was 39.9°C . The patient was in deep coma and showed bilateral midriasis without retraction to light. Extraocular movement was completely absent: the eyes were at midline and oculocephalic reflex was absent. The tendon reflexes were hyperactive with positive Babinski's sign bilaterally. Marked nuchal stiffness was noted. White blood cell count was $12.3 \times 10^3/\mu\text{L}$ with 88 percent neutrophils and C-reactive protein was 26.4 mg/dL. Serum vitamin B₁ concentrations, electrolytes, thyroid hormone and ammonia concentrations were normal. A brain computed tomography scan was normal. Cerebrospinal fluid (CSF) examination showed 317 leukocytes/mm³ (83% lymphocytes) with an elevated protein content (226 mg/dL) and low glucose concentration (10 mg/dL). Empirical treatment with ceftriaxone, piperacillin, and acyclovir was started. On day 3, *Listeria monocytogenes* was cultured from both CSF and blood, and the antibiotic treatment was changed to ampicillin. Brain magnetic resonance images

(MRI) obtained on day 10 showed a midbrain lesion with hydrocephalus (Fig. 1A, 1C). No contrast enhancement was detected. On day 15, marked improvement of consciousness and eye movements were noted. The midbrain lesion on MRI almost disappeared completely on day 17 (Fig. 1B, 1D).

Brainstem infection, termed "rhombencephalitis", caused by *Listeria monocytogenes* is a rare and under-recognized condition with a high mortality rate (1-3). The predisposing factor for listerial infection in our patient was the long-term immunosuppressive therapy. The MRI findings in the central midbrain lesion suggested the co-presence of Wernicke encephalopathy, which typically occurs in patients with alcohol abuse, but is also reported in some nonalcoholic patients (4). In the present patient, serum vitamin B₁ was normal and ampicillin treatment reduced the abnormal signal in the midbrain and resulted in improvement of clinical symptoms, suggesting the diagnosis of rhombencephalitis rather than the co-occurrence of Wernicke encephalopathy. Listerial brainstem encephalitis should be included in the differential diagnosis of symmetric midbrain lesions, and should be treated promptly with appropriate antibiotics.

References

1. Bartt R. Listeria and atypical presentations of *Listeria* in the central nervous system. *Semin Neurol* **20**: 361-373, 2000.
2. Antal EA, Dietrichs E, Løberg EM, Melby KK, Maehlen J. Brain stem encephalitis in listeriosis. *Scand J Infect Dis* **37**: 190-194, 2005.
3. Alper G, Knepper L, Kanal E. MR findings in listerial rhombencephalitis. *AJNR Am J Neuroradiol* **17**: 593-596, 1996.
4. Zhong C, Jin L, Fei G. MR Imaging of nonalcoholic Wernicke encephalopathy: a follow-up study. *AJNR Am J Neuroradiol* **26**: 2301-2305, 2005.