



Clinical characteristics of patients with acute meningitis after lumbar epidural nerve blocks

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BACKGROUND & SIGNIFICANCE

- Lumbar epidural nerve block (ENB) is widely used for the treatment of lumbar radicular pain caused by the inflamed spinal nerves. Various complications like post-dural puncture headache, transient paraparesis, and hypotension may occur.
- Meningitis has been rarely reported after receiving a lumbar root injection. The purpose of this study was to assess the clinical characteristics of acute meningitis after lumbar ENB.

Subjects and Methods

Subjects

- 113 patients who had treated with acute bacterial meningitis (ABM) during a 5-year period (August 2014 to July 2019) were retrospectively evaluated. Only patients with a history of lumbar ENB just before the development of meningitis were enrolled.

Methods

- ABM was diagnosed according to the EFNS guideline for ABM.
- Medical data including epidemiologic features, clinical findings, laboratory findings, and radiologic findings.

Results

Demographic data of 6 enrolled patients

- Time interval from lumbar ENB to onset of meningitis : **2.5hours** (range, 1-4 hours). Time interval from symptom onset to arrival to emergency room : **12.5 hours** (range, 2-40 hours).

Clinical characteristics

- Common manifestations : Headache & High fever

Laboratory findings

- leukocytosis (range, 12,000-20,900/mm³) with no significant elevation of CRP. Leukocytosis has been slightly decreased, whereas CRP has been more increased just after the treatment.
- CSF analysis revealed pleocytosis (range, 5,425-8,614/mm³), an elevated proteins (range, 264.9-620 mg/dL), the decreased ratio of CSF glucose to serum glucose (range, 0.02-0.43), high titers of CSF lactate (range, 5.84-13.2), but no bacteria was cultured in CSF.

Radiologic findings

- Diffuse leptomenigeal-or pachymeningeal enhancement and diffuse sulcal hyperintensity on T2-weighted images were common. Pneumocephalus was identified in two patients

Patients	1 (SJS)	2 (JSR)	3 (CSS)	4 (KJP)	5 (SDS)	6 (JSH)
Age, years	83	80	61	50	72	63
Sex	F	F	M	M	F	
Clinical findings						
Headache	+	+	+	+	+	+
Fever	+	+	+	+	+	+
Orthostatic headache	-	-	-	-	-	-
Altered mentality	-	-	-	-	-	-
Seizure	-	-	-	-	-	-
Neck stiffness	-	+	-	+	-	+
Focal neurologic sign	-	-	-	-	-	-
LEB to symptom onset, hr	3	1	2	4	3	2
Symptom onset to arrival, hr	2	9	2	16	40	36
Corticosteroids	+	+	+	+	+	+
Antibiotics	+	+	+	+	+	+
Time to improve	1	1	1	1	1	1
Admission duration, day	14	14	14	14	14	14

Patients	1 (SJS)	2 (JSR)	3 (CSS)	4 (KJP)	5 (SDS)	6 (JSH)
Laboratory findings						
Admission day						
Leukocytosis, / μ L	12,300	13,700	12,000	14,300	12,300	20,900
CRP, mg/dL	0.14	0.97	0.2	0.15	0.1	0.77
Next day after treatment						
Leukocytosis, / μ L	10,600	10,900	10,800	13,800	4,700	6,600
CRP, mg/dL	3.4	5.09	0.24	1.08	2.1	2.36
Procalcitonin, ng/mL	0.026	0.315	0.020	0.020	0.159	0.176
Serum lactate	2.48	2.87	2.8	1.19	ND	2.5
CSF finding						
WBC, /mm ³	8,614	6,251	7,583	5,425	15,600	7,445
Neutrophil count, %	90	85	98.6	88.4	90	83
RBC, /mm ³	88	22	50	500	150	160
Protein, mg/dL	507.4	379.1	275.6	264.9	620	500
Glucose, mg/dL	63	41	24	45	2	105
Glucose (CSF/Serum)	0.37	0.27	0.18	0.43	0.02	0.29
Lactate, nmol/L	8.94	8.64	8.36	5.84	13.2	ND
ADA, IU/L	3.7	NA	1.0	9	5.6	8.6
Culture	-	-	-	-	-	-
Radiologic findings						
Sulcal hyperintensity	+	+	-	-	-	+
Menigeal enhancement	+	+	-	+	-	+
Ventriculitis	-	-	-	-	-	+
Pneumocephalus	-	-	+	-	-	+
Hydrocephalus	-	-	-	-	-	+

Conclusion & Discussion

- Acute meningitis may occur in patients who received lumbar ENB, especially within only several hours after the treatment of lumbar root injection
- ABM after lumbar ENB has been dramatically improved within 24 hours after the treatment with no prominent evidence of the constitutional infection, which suggests that acute meningitis after lumbar ENB may be chemicals-induced meningitis rather than bacterial meningitis.
- Further study will be needed for verifying the pathomechanism in acute meningitis after lumbar ENB.