

2001 12



가

.

.

	<i>ii</i>
	1
I.	3
II.	6
1.	6
2.	6
III.	7
1.	7
2.	7
3.	7
4.	adenosine deaminase	8
5.	8
6.	8
IV.	11
V.	15
	16
	19

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4 8 가
가 .

가

가

1991

2001

가

가

49

21

() . 11

가 () 17

adenosine deaminase(ADA)

ADA

1

가

가

ADA

18-24

: , , , , adenosine
deaminase

< >

I.

가 4 8 가
1,2,3 가
가 가
1985 가
16% 가^{3.}
가
4. 가 ,
가 가 (OECD)
가 1 가 가
가
6

18

24

^{5,6,7},

(ELISA)

⁸.

가,

가,

adenosine deaminase

(ADA)

가

^{9,10}.

,

가

PPD

ELISA

가

가

^{11,12}.

가

가

가

¹³.

가

.

.

가

가

가

가

가

가

가

II.

1.

1991 2001

가

Gram

, India ink

cryptococcal

2.

가. Group 1()

. Group 2()

ADA

. Microsoft Excel

III.

49 . Group 1 21 , Group 2
 11 17

1.

가. Group 1. 가 11 가 10 37.9 .
 18
 가 3 .

. Group 2. 가 6 가 5 31.3
 (Table 1).

2.

Group 1 364.7 /ml
 가 66.6% . Group 2 358.8 /ml
 가 89.5% .
 (Table 2).

3.

Group 238.7 mg/dl 178.9 mg/dl .
 Group 1 2 가 (Table 2).

4. ADA

¹⁰ cut-off point

10 unit/L Group 1 21 13 (61.9%), Group

2 11 5 (45.4%) Group 1 . Group

Group 1 14.1 unit/L, Group 2 10.4 unit/L

가 (Table 2).

5.

Group 1 11 (52 %), 4 (19 %),

5 (24 %), 1 (5 %) .

Group 2 8 (73 %),

1 (9 %), 2 (18 %) (Table 3).

6.

32 10

. Group 1 11

(52%) . 3

, 1 , 1 , 2 , 1

, 2 , 1 . Group 2 3

. 2 ,

1 (Table 4).

Table 1. Age and gender of each group

	Group 1 ¹	Group 2 ²
Age(years)	37.9 ± 3.6	32.8 ± 3.3
M : F	11 : 10	6 : 5

¹ Positive microbiological study or PCR for
Mycobacterium tuberculosis in cerebrospinal fluid

² Negative PCR for *Mycobacterium tuberculosis* in cerebrospinal fluid

Table 2. Cerebrospinal fluid findings and ADA activity.

Laboratory test	Group 1 ¹	Group 2 ²
Cell counts(/ml)	367.4 ± 89.2	358.8 ± 90.3
Mononuclear cell counts(%)	66.6 ± 7.0	89.5 ± 5.9
Protein (mg/dl)	238.7 ± 29.2	178.9 ± 30.4
ADA (U/L)	14.1 ± 1.4	10.4 ± 2.2

Values are expressed as mean ± standard error

¹ Positive microbiological study or PCR for
Mycobacterium tuberculosis in cerebrospinal fluid

² Negative PCR for *Mycobacterium tuberculosis* in cerebrospinal fluid

Table 3. Chest X-ray findings.

Finding	Group 1 ¹	Group 2 ²
Active Tuberculosis	4	1
Miliary Tuberculosis	5	0
Inactive Tuberculosis	1	2
Normal	11	8
Total	21	11

¹ Positive microbiological study or PCR for
Mycobacterium tuberculosis in cerebrospinal fluid

² Negative PCR for *Mycobacterium tuberculosis* in cerebrospinal fluid

Table 4. Neuro-image findings.

Finding	Group 1 ¹	Group 2 ²
Basal cistern enhancement	3	
Leptomeningeal enhancement	1	2
Infarction	1	
Hydrocephalus	1	
Cortical atrophy	1	
Granuloma	2	
Temporal lobe inflammation	1	
Coroidal plexitis		1
Normal	11	8
Total	21	11

¹ Positive microbiological study or PCR for
Mycobacterium tuberculosis in cerebrospinal fluid

² Negative PCR for *Mycobacterium tuberculosis* in cerebrospinal fluid

IV.

가 8-86% 가 8,14,15

가

가

5,10,16,17

가

92% , 가 (highly probable)
48% , 가 (possible)
가 75% 가 43% 가

16,18

가

가

(sub group)

가 가

가

가 10%

8,16

in vitro

가 90%

5,7,8,16,19

가

19

가

가

가

가

() 가,

가,

가

ADA

가

가

¹⁰.

ADA

가

가,

가,

가

ADA

가

가 .
1 가 .
가 가 6.7 .
가 가 가
90% .
가 가 가 .
가 , 가 가
가 가 100% 가
가 .

V.

	1991	2001
가		49
1.		.
2.	ADA	.
3.		.
4.		, ,
가		.
		가 ,
	ADA	가

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Abstract

Usefulness of Laboratory Tests in Patients with Clinically Suspected Tuberculous Meningitis

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Early detection and early treatment are very important in tuberculous meningitis(TBM) because it has a grave prognosis if it is left untreated. Definite diagnosis of TBM can be made by detecting *Mycobacterium tuberculosis* in cerebrospinal fluid(CSF) by a microscopic examination or a culture study. However, initiation of antibiotics cannot be delayed until the microbiological proof because these studies have a low sensitivity and about 6-8 weeks are necessary to be proved by a culture study. Therefore, antibiotics are given to most patients who are clinically suspected to have TBM without microbiological evidence.

In this study, patients with meningitis, who admitted to Severance Hospital from 1991 to 2001 and who had taken antituberculous medications, were retrospectively evaluated by the review of medical records. Various laboratory findings were compared between the patients with microbiological evidence of *M. tuberculosis* in CSF and those who without it.

Forty-nine patients with meningitis were enrolled for this study. Among them, 21 patients had evidence of TBM by positive culture or polymerase chain reaction (PCR) studies in CSF (definite TBM group).

Eleven patients showed negative results from culture and PCR studies (non-TBM group). The remainders were excluded from further investigation because PCR studies were not performed.

Cell counts, protein concentration, and adenosine deaminase(ADA) activities in CSF were not significantly different between two groups. However, all but one patient with active pulmonary tuberculosis were found in a definite TBM group. Basal cistern enhancement, graunomas, and a hydrocephalus on imaging studies of the brain were demonstrated only in a definite TBM group.

In conclusion, routine findings or ADA activities in CSF could not be a determinant towards a diagnosis of TBM in patients with meningitis who had taken antituberculous medications under clinical improving of TBM. Findings of pulmonary tuberculosis on a chest roentgenography and those which are suggestive of septic TBM on brain imaging studies were a reliable indicator of TBM.

Key Word : tuberculosis, meningitis, cerebrospinal fluid, polymerase chain reaction, adenosine deaminase