

– Abstract –

The Effects of Intravenous Midazolam to the Pain during Needle Electromyography

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Objective : To investigate the effects of intravenous midazolam to the pain during needle electromyography(EMG).

Methods : Sixty-eight adults were studied. Four to six mg of midazolam($0.6 \times B.W$ or $0.04 \times B.W$) was injected intravenously to 34 examinee in experimental group and no premedication to 34 examinee in control group before the EMG examination. After EMG study, level of pain was assessed by Visual Analogue Scale(VAS) and resistance to needle EMG was evaluated by questionnaire.

Results : VAS was significantly lower in the midazolam group than the control group($P < 0.001$). Resistance of patients to the EMG was also significantly lower in the midazolam group($P < 0.05$).

Conclusion : Intravenous injection of midazolam for EMG study decrease the pain and resistance for needle EMG study

Key Words : Electromyography, Pain, Midazolam

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(17 , 14),
 가 37 (17 , 20)
 (Table 1).

1)

.² , 2)
 , 3) , 4)

. 1960

,³ ,⁴ ,⁵ 44.21±10.44 , 43.62±11.79
 ,⁶ ,⁷ ,⁴

. 1963

William⁸ meperidine promethazine 2.

, 1998 ,⁹ 5% D/W 500 ml
 lidocaine 2.5% prilocaine 2.5% 4~6 mg(0.6 × B.W)
 , 1~2

. 1999

30~40

¹⁰

(=) , 10

10

30

10~20

가 0.5 mg

(Visual Analogue Scale, VAS),¹¹

가

1) ‘

, 2) ‘

, 3) ‘

, 4) ‘

1. ,¹⁰

99 10 2000 3

68

34 (18 , 16)

34 (19 , 15)

(Table 2).

가 31

Table 1. Characteristics of Subjects

Group	Age(yrs.)	Normal	Radiculopathy	Number of Patients		
				Male	Female	Total
Control	44.21±10.44	20	14	18	16	34
Midazolam	43.62±11.79	17	17	19	15	34

Values are mean±S.D.

3. T-test, Mann-Whitney U, Chi-square test, P=0.05, 2.67±1.40, 5.45±1.77, (p<0.001, Table 4), 17, 4, 10, 3, 0, 8, 11, 1, 2.41±1.27, 5.61±1.53, (p<0.001, Table 3), 2.16±1.12, 5.86±1.13, (p<0.001, Table 5), 17, 4, 10, 14, 2, 10, 1, 1, Chi-square test, (p<0.05, Table 5), 2.67±1.40, 2.16±1.12, (p>0.05, Table 6), 10, 10, 가 3, (p>0.05, Table 6).

Table 2. Questionnaire

(O)	
0	10
()	?
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()	
()	
()	
?	
()	()

Table 3. Pain Score and Resistance

Group	Age(yrs.)	VAS ¹	Resistance ^{**}			
			None	Mild	Moderate	Severe
Control(n=34)	44.21±10.44	5.61±1.53	2	12	18	2
Midazolam(n=34)	43.62±11.79	2.41±1.27*	6	20	4	0

Values are mean±S.D.

* P<0.001

** P<0.05

1. VAS: Visual Analogue Scale

Table 4. Pain Score and Resistance in Normal Subjects

Group	Age(yrs.)	VAS ¹	Resistance ^{**}			
			None	Mild	Moderate	Severe
Control(n=20)	43.25±11.89	5.45±1.77	1	11	8	0
Midazolam(n=17)	44.18±12.61	2.67±1.40*	3	10	4	0

Values are mean±S.D.

* P<0.001

** P>0.05

1. VAS: Visual Analogue Scale

Table 5. Pain Score and Resistance in Radiculopathy Patients

Group	Age(yrs.)	VAS ¹	Resistance ^{**}			
			None	Mild	Moderate	Severe
Control(n=14)	45.57±8.16	5.86±1.13	1	1	10	2
Midazolam(n=17)	43.06±11.28	2.16±1.12*	3	10	4	0

Values are mean±S.D.

* P<0.001

** P<0.05

1. VAS: Visual Analogue Scale

Table 6. Pain Score and Resistance of Normal Subjects and Radiculopathy Patients in Midazolam Group

Group	Age(yrs.)	VAS ¹	Resistance [*]			
			None	Mild	Moderate	Severe
Normal(n=17)	44.18±12.61	2.67±1.40	3	10	4	0
Radiculopathy(n=17)	43.06±11.28	2.16±1.12*	3	10	4	0

Values are mean±S.D.

* P>0.05

1. VAS: Visual Analogue Scale

Table 7. The Will of Patients for the Premedication before Next needle Electromyography

Group	Yes	No	Total
Control	23(67.7%)	11(32.3%)	34(100%)
Midazolam	26(76.5%)	8(23.5%)	34(100%)
Total	49(72.1%)	19(27.9%)	68(100%)

Values are number of cases

26

11

23

8

(p>0.05,

Table 7).

Table 8. Differences between Pain Control Methods during Needle Electromyography

Group	VAS [†]		Times from medication to beginning examination
	control	anesthetics	
Local ointment ¹	6.20±1.80	3.10±2.00*	90 min.
Midazolam P.O. ²	6.80±1.90	5.22±2.20**	30~60 min.
Midazolam I.V.	5.61±1.53	2.41±1.27***	1~5 min.

Values are mean±S.D.

* P<0.01, ** P<0.05, *** P<0.001

† VAS: Visual Analogue Scale

1. , : . 1998: 22: 1279-1283

2. , , : . 1999: 23: 325-329

가 4.4 6.9

30~60

90

1~5

가
(Table 8).

가 5.45±1.77, 5.86±1.13

가 ,

가 5.21±1.48, 6.06±1.51

^{6,7,15}

1998

(31.3%),

가

(18.8%)

Benzodiazepine-GABA_a Receptor-Chloride Ion Complex

Lajoie³ 1963

가

⁵

⁶

⁴

⁷

, teflon

⁴

가

60

0.06 ×

, 60

¹⁶

1999

¹⁰

가 5.22±2.20

0.04 ×

⁹ Lidocaine 2.5%

Prilocaine 2.5%

3.10±2.00

가 2.41±1.27

0.2 mg 15

¹⁷

34 3
 , 1
 10
 Oxymetry
 1~5 , 15~45 가 ,¹⁷
 1~5 가 가
 가 가
 가 ,¹⁸
 가 가 ,^{19,20}
 Prepulse inhibition 가
 ,²¹ 가
 가 가
 가 가 1999 ¹⁰
 가 가 가
 가 가 ,
 가 가
 가
 가
 34 34
 1)
 2)
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4)
 5)
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