

추간판내 Prostaglandin E₂ 양의 임상적 의의*

김형석 · 조기홍 · 김기용 · 안영환 · 안영민 · 윤수한 · 조경기

= Abstract =

Clinical Implication of Prostaglandin E₂ Content in Lumbar Disc Disease

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Objective : A prospective biochemical assay of prostaglandin E₂ content in symptomatic lumbar disc materials was done in order to clarify the pathogenesis of lumbar radiculopathy.

Patients and Methods : Forty - eight disc specimens were purified by a standard solid - phase extraction procedure and analyzed by an enzymelinked immunosorbent assay for prostaglandin E₂. Clinical and anatomic correlations were evaluated with analysis of variance and *t* - test.

Results : Acute herniated lumbar disc diseases tended to be associated with a higher prostaglandin E₂ content than degenerative lumbar disc disease. Sequestered discs tended to be associated with a higher prostaglandin E₂ content than extruded discs, which also showed higher prostaglandin E₂ content than protruded ones. A sciatica and positive straight leg raising test appeared to be associated with a higher prostaglandin E₂ content than a negative test.

Conclusion : This result suggests that the level of prostaglandin E₂ would be correlated with clinical symptom and sign in the inflammatory process of lumbar disc herniation.

KEY WORDS : Intervertebral disc herniation · Radiculopathy · Prostaglandin E₂.

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18)21)22)

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2). 1934

Mixer

Barr

‘ mechanical compression theory ’

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prostaglandin E₂

3cc methyl alcohol
N₂ gas prostaglandin

대상 및 방법

1. 대 상

1996 3 1999 1 70
350
group 1 group 2
Group 1 (,)
350 205 group 2
(,) 145
group 1 13 , group 2 6 , 19
group 1
36
group 2 12
48 prosta-
glandin E₂ (Table 1).

2. 방 법

prostaglandin E₂
Powell solid phase extraction
17). mechanical tissue
mincer
100 μM indomethacin phosphate buffer
solution 1cc
4cc 100% ethyl alcohol 30
1cc 1cc N₂ gas
ethyl alcohol oc-
tadecylsilyl silica column(Sep - Pak cartridges, Waters)

Table 1. Disease entities vs. intervertebral disc specimens

Disease entities	Disc specimens(No.)			Total (No.)
	AF	NP	RP	
Group 1 (13 cases)				
Protrusion(3 cases)	3	3	-	6
Extrusion(4 cases)	4	4	4	12
Sequestration(6 cases)	6	6	6	18
Group 2 (6 cases)				
Stenosis(2 cases)	2	2	-	4
Listhesis(4 cases)	4	4	-	8
Total(No.) 19 cases	19	19	10	48

Listhesis : Spondylolisthesis

AF : annulus fibrosus, NP : nucleus pulposus, RP : ruptured particle

ELISA kit(Bio-grak™, Prostaglandin E₂ competitive enzyme - immunoassay system, Amersham Pharmacia Biotech, Buckinghamshire, England)

prostaglandin E₂
(, ,)
ANOVA(analysis of variance) independent t test

결 과

19 14 5
40 . Group 1 13 3 , 4
, 6 , group 2 6 4
, 2
19 13 19
. Group 1 35 ° 8 ,
35 ° 5 (Table 2).

Table 2. Summary of results

Patient	Sex	Age	Group	Disease	LBP	Sciatica	SLR	PG E ₂ (pg/gm)
1	M	30	1	P	-	+	2	13.31
2	M	34	1	P	-	+	2	15.93
3	F	39	1	P	+	+	2	16.09
4	M	23	1	E	+	+	1	18.22
5	M	21	1	E	+	+	1	17.08
6	M	56	1	E	-	+	2	17.00
7	M	25	1	E	+	+	2	16.52
8	F	48	1	S	-	+	1	31.82
9	M	26	1	S	-	+	1	17.95
10	M	25	1	S	-	+	1	27.10
11	M	35	1	S	+	+	1	24.76
12	F	40	1	S	+	+	1	31.71
13	M	53	1	S	+	+	1	16.69
14	M	65	2	lis	+	-	-	3.83
15	M	60	2	lis	+	+	-	19.98
16	M	65	2	st	+	-	-	9.61
17	M	44	2	st	+	+	-	15.29
18	F	54	2	st	+	+	-	10.63
19	F	49	2	st	+	+	2	19.76

1 : <35', 2 : >35'

P : Protrusion, E : Extrusion, S : Sequestration, lis : Spondylolisthesis, st : Spinal stenosis, LBP : Low back pain, Sciatica : Radiating leg pain, LR : Straight leg raising test

Prostaglandin E₂

Table 3. Disc materials and prostaglandin E₂ content

No.	Group	Disease	Content	PG E ₂ (pg/gm)
1	1	P	AF	9.06
2	1	P	NP	17.55
3	1	P	AF	15.53
4	1	P	NP	16.34
5	1	P	AF	15.54
6	1	P	NP	16.65
7	1	E	AF	10.45
8	1	E	NP	13.54
9	1	E	RP	30.68
10	1	E	AF	10.50
11	1	E	NP	16.12
12	1	E	RP	22.93
13	1	E	AF	14.75
14	1	E	NP	19.25
15	1	E	RP	16.65
16	1	E	AF	12.55
17	1	E	NP	19.30
18	1	E	RP	19.39
19	1	S	AF	6.13
20	1	S	NP	26.36
21	1	S	RP	41.79
22	1	S	AF	5.57
23	1	S	NP	20.79
24	1	S	RP	68.78
25	1	S	AF	5.91
26	1	S	NP	10.00
27	1	S	RP	31.51
28	1	S	AF	16.52
29	1	S	NP	7.36
30	1	S	RP	29.97
31	1	S	AF	5.56
32	1	S	NP	12.99
33	1	S	RP	31.51
34	1	S	AF	18.60
35	1	S	NP	10.62
36	1	S	RP	52.07
37	2	lis	AF	2.45
38	2	lis	NP	5.21
39	2	lis	AF	15.11
40	2	lis	NP	24.84
41	2	st	AF	9.66
42	2	st	NP	9.57
43	2	st	AF	17.32
44	2	st	NP	13.27
45	2	st	AF	20.59
46	2	st	NP	18.94
47	2	st	AF	12.50
48	2	st	NP	8.76

P : Protrusion, E : Extrusion, S : Sequestration, lis : Spondylolisthesis, st : Spinal stenosis, AF : Annulus fibrosus, NP : Nucleus pulposus, RP : Ruptured intervertebral disc

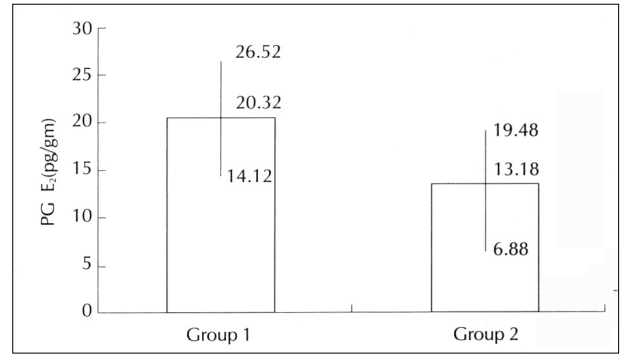


Fig. 1. Prostaglandin E₂ content in disc materials in each group. Group 1 : Patients with simple herniated intervertebral disc (n=13). Group 2 : Patients with chronic degenerative spinal disease (n=6).

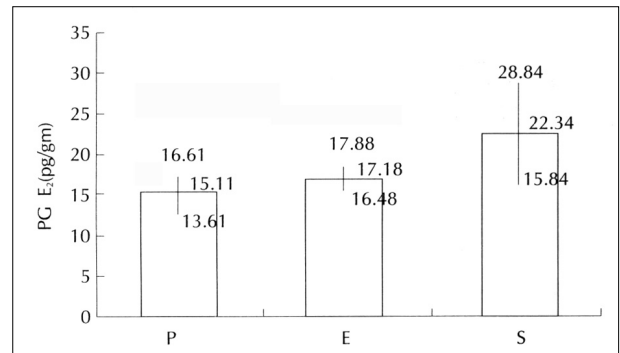


Fig. 2. Prostaglandin E₂ content in different types of intervertebral disc herniation among Group 1 (P : Protrusion, E : Extrusion, S : Sequestration).

19 48 prosta-
glandin E₂ 2.45 68.78pg/gm(: 17.85
pg/gm) . Prostaglandin E₂ 5
pg/gm (Table 3).
Group 1 group 2 prostaglandin E₂ 가
20.32 ± 6.2pg/gm 13.18 ± 6.3pg/gm
(Fig. 1)(p<0.05). Group 1
15.11 ±
1.5pg/gm : 17.18 ± 0.7pg/gm : 22.34 ± 6.5pg/gm
가
(Fig. 2)(p<0.05), :
: 11.28 ± 4.6 : 15.91 ± 5.0 : 34.53
± 15.8pg/gm ,
가 (Fig. 3)(p<0.05).
prostaglandin E₂ 19.4 ±
6.0 : 6.72 ± 4.0pg/gm
(Fig. 4)(p<0.05), group 1 35 °
35 ° 23.17 ± 6.5 : 15.77 ±

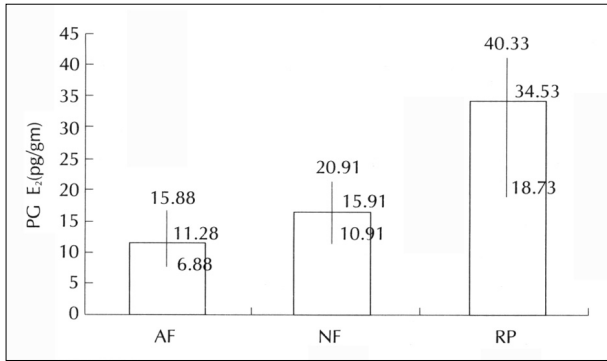


Fig. 3. Prostaglandin E₂ content by the site of herniated intervertebral disc in Group 1 (AF : annulus fibrosus, NF : nucleus pulposus, RP : ruptured intervertebral disc).

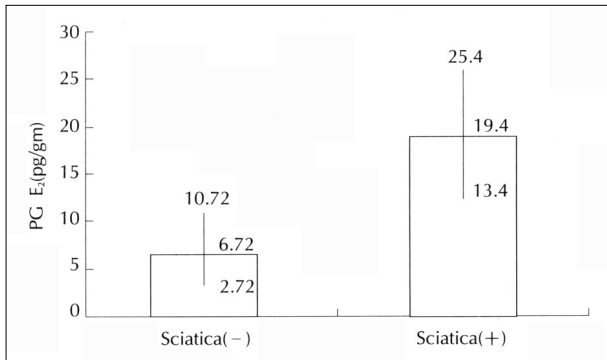


Fig. 4. Prostaglandin E₂ content by presence of sciatica.

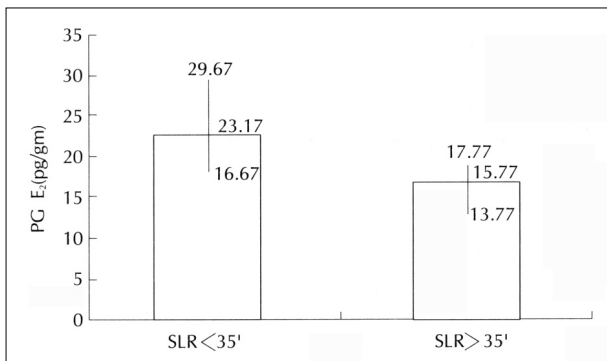


Fig. 5. Prostaglandin E₂ content by the degree of straight leg raising test.

2.0pg/gm 35° (Fig. 5) ($p < 0.05$).
prostaglandin E₂

고찰

6)10)19)

phospholipase A₂

가 가

가 6)19). 1987
McCarron

10)

가

12)

phospholipase A₂, cytokines, prostaglandin E₂,
nitric oxide, immunoglobulins 16)

1990 Saal phospho-
lipase A₂ 20 10,000

19) 1992 Franson

phospholipase A₂가

4). Phospholipase A₂

arachidonic acid me-
tabolites, prostaglandin leukotriens
2 16). 1992 Saal

phospholipase A₂가

20)

1994 Willburger Wittenberg
kotriene 가 prostaglandin leu-
, 1996 Kang

prostaglandin E₂ 가

가

23)24)

1996 John

prostaglandin E₂ 가

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13)

Phospholipase A₂ 2 pros-
taglandin leukotriene

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3)5)8)9)15)

prostaglandin E₂

. Prostaglandin E₂ 가

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prostaglandin E₂

Prostaglandin E₂ 가

prostaglandin E₂

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