

## Epidemiologic study of lumbar scoliosis with plain abdominal X-ray

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### – Abstract –

**Study Design:** A retrospective cross-sectional study

**Objectives:** To analyze the prevalence and characteristics of lumbar scoliosis using plain abdominal X-rays, according to age.

**Literature Review Summary:** The single lumbar curves of adolescents have shown 10–20% idiopathic scoliosis, but the reported prevalence of adult lumbar scoliosis ranges from 2.5 to 7.5%. In Korea, there is no useful basic data concerning lumbar scoliosis.

**Materials and Methods:** A total of 2877 plain abdominal radiographies (supine and erect), taken at our hospital, between August 2001 and June 2002, were retrospectively investigated. The ages of the patients ranged from 11 to 80 years, and the patients were grouped according to age. The prevalence, Cobb angle, ratio of males and females, ratio of right and left curves, location of end and apex vertebra, the number of involved vertebra in primary curve, amount of rotation and osteophytes were all examined.

**Results:** The overall prevalence of lumbar scoliosis was 4.3% (N=124), but rapidly increased after the sixth decade. The average Cobb angle was 16.2°. A positive correlation was found between the Cobb angle and age ( $r=0.275$ ,  $P<0.05$ ). The ratios of males to females and of the right to left curves were both about 1:2. The most common sites of upper end vertebra were T12 and L1, that of the lower end vertebra L4 and those of the apex L2 (N=48) and L3 (N=40). Most (N=111) had grade 1 rotation. With regard to the magnitude of the curves, no other factors were statistically significant.

**Conclusions:** De novo scoliosis can be considered to develop rapidly after the sixth decade. The Cobb angle had a positive correlation with age ( $r=0.275$ ,  $p<0.05$ ). These data are thought could be useful and valuable for future study of lumbar scoliosis.

**Key Words:** Lumbar scoliosis, Prevalence, Plain abdominal X-ray

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Cobb 2) 가  
10.

. Kostuik

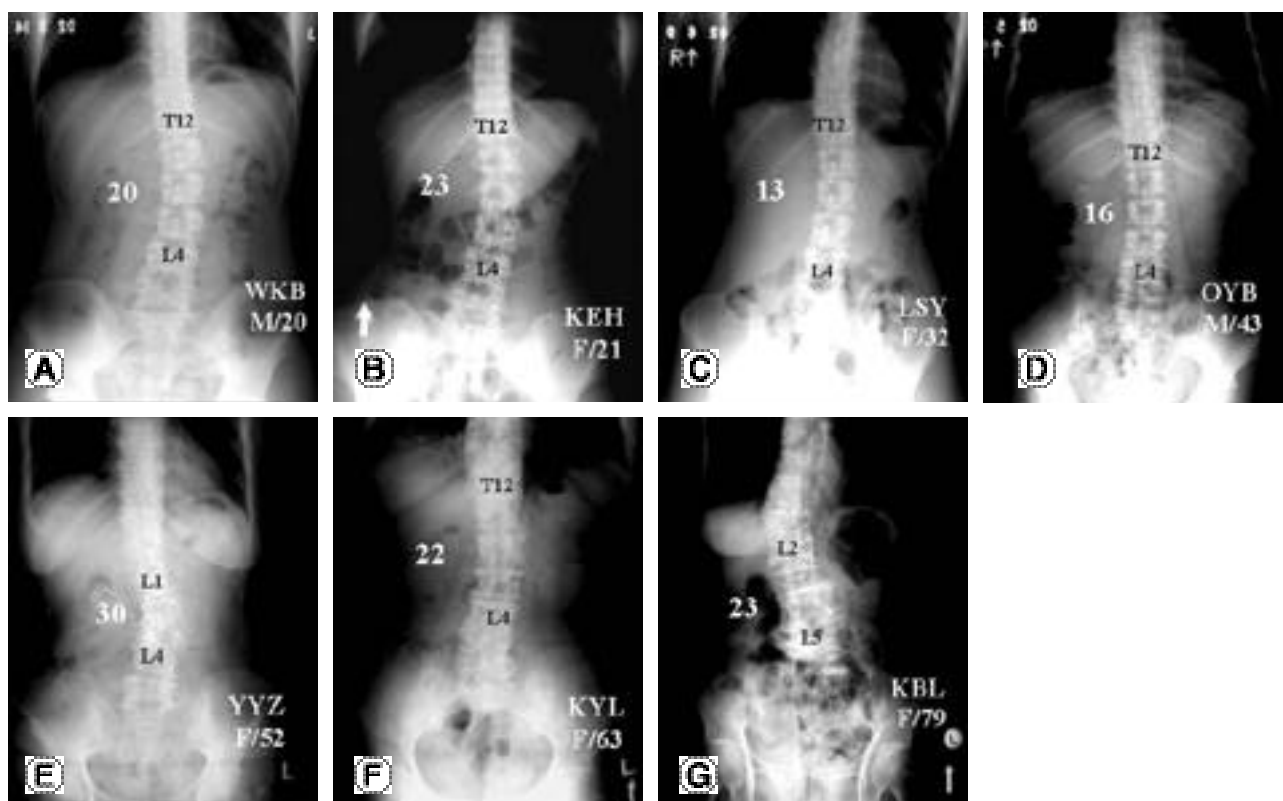
Bentivoglio<sup>1)</sup> 20 IVP 5000 ,  
2.5%

가

2877 10 (11~20 ), 20  
(21~30 ), 30 (31~40 ), 40 (41~50 ), 50 (51~60  
, 60 (61~70 ), 70 (71~80 )

2001 8 1 2002 6 30

11 80



**Fig. 1.** These erect abdominal X-ray radiographies are examples of lumbar scoliosis grouped by age ((A) the second decade, (B) the third decade, (C) the fourth decade, (D) the fifth decade, (E) the sixth decade, (F) the seventh decade, (G) the eighth decade). The locations of apex are between the intervertebral disc space of L1 and L2 and body of L4. They show lumbar scoliosis of significant vertebral rotation and more than 10.

(SPSS 10.0).

de novo

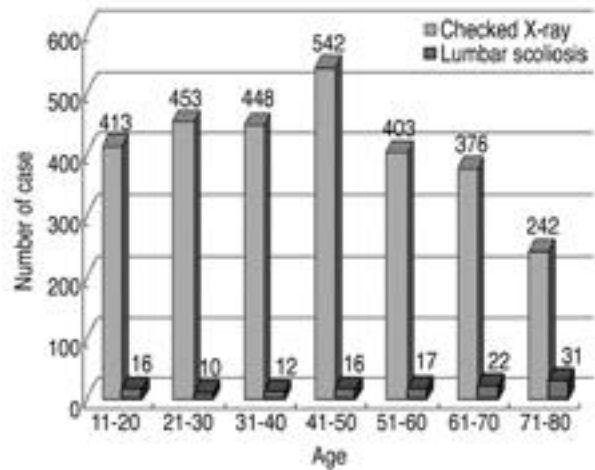
10 ~19 ° 102 , 20 ~29 ° 17 ,

30.~39. 3 , 40.~49. 1 , 50.~59. 1

124

가 43 , 가 81

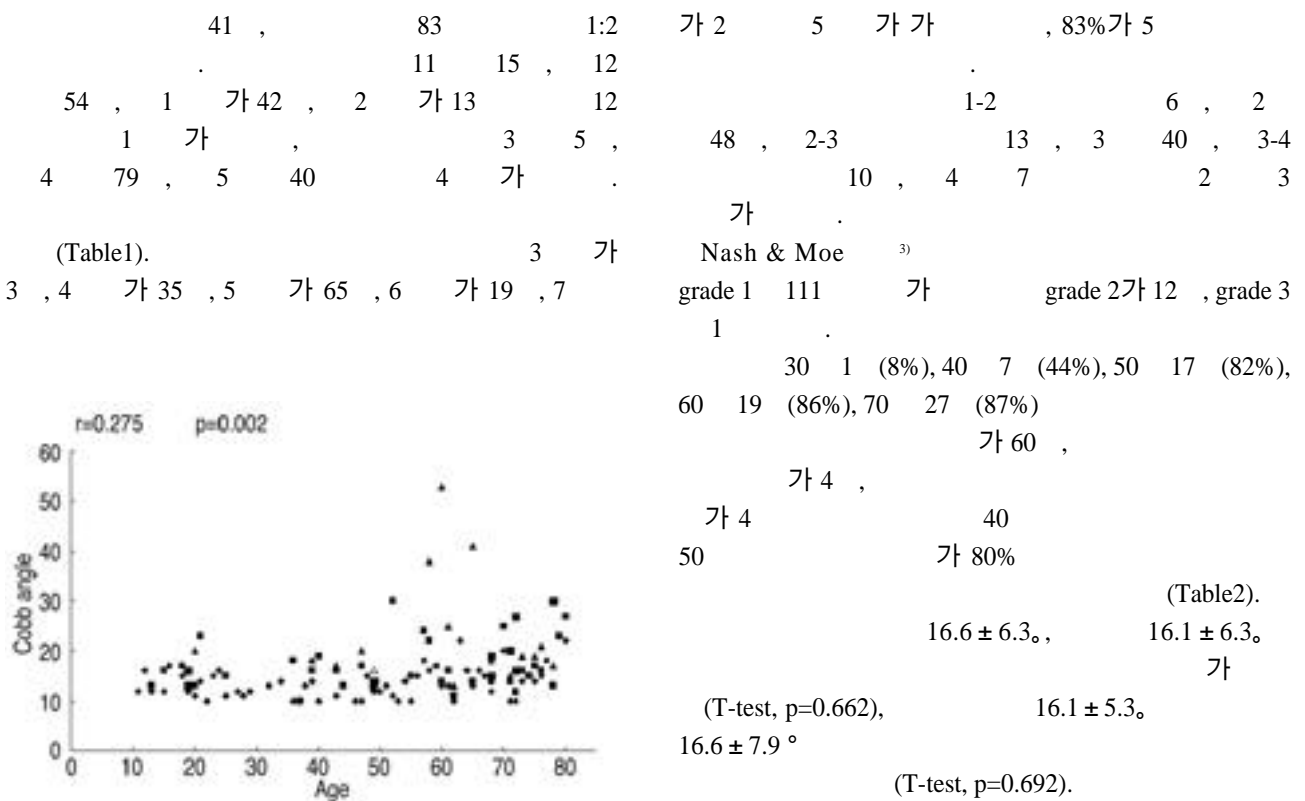
1296 1581 2877 , 124  
 4.3% , 10  
 3.9%, 20 2.2%, 30 2.7%, 40 3.0%, 50 4.2%, 60  
 5.9%, 70 12.8% 20 가  
 50 가  
 (Fig. 1,2, Table 1). 70 60  
 가 16.2 ± 6.3.  
 10 14.3 ± 2.5°, 20 13.9 ± 3.8°, 30 13.8 ± 3.4°, 40  
 13.9 ± 2.8°, 50 19.6 ± 11.3°, 60 17.3 ± 6.7°, 70  
 17.6 ± 5.2. 가  
 (r=0.275, p=0.002, Fig. 3). 가  
 50 2 60 2  
 (r=0.34, P=0.000).



**Fig. 2.** The number of checked radiographies and lumbar scoliosis according to age.

**Table 1.** Results of measurement (1)

Age	11-20	21-30	31-40	41-50	51-60	61-70	71-80	total
No. of checked X-ray	413	453	448	542	403	376	242	2877
No. of lumbar scoliosis	16	10	12	16	17	22	31	124
Prevalence (%)	3.9	2.2	2.7	3.0	4.2	5.9	12.8	4.3
Cobb angle (°)								
Mean	14.3	13.9	13.8	13.9	19.6	17.3	17.6	16.2
SD	2.5	3.8	3.4	2.8	11.3	6.7	5.2	6.3
No. of male curve	7	3	4	6	3	9	11	43
No. of female curve	9	7	8	10	14	13	20	81
No. of Rt. curve	6	3	3	5	6	6	12	41
No. of Lt. curve	10	7	9	11	11	16	19	83
Level of curve								
T11-L3					1		1	2
T11-L4		3	2		4	1	1	11
T11-L5				1		1		2
T12-L3					1	1	1	3
T12-L4	7	6	2	8	2	8	10	43
T12-L5	1		2	1	2	1	1	8
L1-L4	4		2		2	7	7	22
L1-L5	3		4	3	4	1	5	20
L2-L4				1	1		1	3
L2-L5	1	1		2		2	4	10



**Fig. 3.** Correlation between Cobb angle and age  
r: Pearson 's linear correlation coefficient

**Table 2.** Results of measurement (2)

Age	11-20	21-30	31-40	41-50	51-60	61-70	71-80	total
No. of involved segments								
3				1	1		1	3
4	5	1	2	2	3	10	12	35
5	10	6	6	11	7	9	16	65
6	1	3	4	1	6	2	2	19
7				1		1		2
Apex of curve								
L1-2	1		1		2	1	1	6
L2	7	9	4	7	4	7	10	48
L2-3	1		2		1	5	4	13
L3	5		4	8	7	6	10	40
L3-4	2	1			2	1	4	10
L4			1	1	1	2	2	7
Rotation of apex								
1	16	9	12	16	13	18	27	111
2		1			3	4	4	12
3					1			1
Location of spur								
Concave			1	5	14	15	25	60
Convex				1		2	1	4
Both				1		2	1	4

21.2 ± 11.4. (x)  
 (y) y = 4.17+0.27x (r=0.30,  
 p= 0.036) R  
 1~3% 1950 가  
 4-7), 20~25% 8,9) 1980 10~15% 가  
 10,11) 0.1~0.4% p=0.002) R 0.07  
 10 3.9% 20, 30 y = 11.9+0.08x (r=0.275,  
 , 40 가 4 y = 11.8+0.07x (r=0.34,  
 10 가 가 p=0.000) R 0.12  
 (positive correlation)가  
 15) 50 31  
 가  
 (r=0.28, p>0.05)  
 Korovesis<sup>16)</sup> 가  
 137 2  
 (lateral spondylolisthesis; x<sub>1</sub>), Harrington factor(  
 ; x<sub>2</sub>), disc index(  
 wedging; x<sub>3</sub>)가  
 y( )=  
 1.884+0.63x<sub>1</sub>+2.712x<sub>2</sub>-0.375x<sub>3</sub> (r=0.922, P<0.0002)  
 (sacral inclination)  
 Schwab<sup>17)</sup> 95 , 3 4  
 7.5% , ,  
 (sagittal pelvic tilt index),  
 11 80 4.3%  
 , 21 4.4%  
 50 가 ,  
 40 50  
 de novo 16.2. 16~24. 13-16)  
 50  
 de novo 11 1  
 가 (a short  
 20.  
 reciprocating curve)  
 Pritchett Bortel<sup>14)</sup> 200  
 5 73% 3. 가  
 Peronnou<sup>13)</sup>

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 :  
 : 2001 8 1 2002 6 30 11 80  
 가 1-2  
 4 , Cobb  
 10. 2877  
 , , , , ,  
 .  
 : 124 4.3% , 50 가  
 16.2. 가 .  
 1:2 . 12 1 가 , 4 가가 .  
 2 (N=48) 3 (N=40)가 , 111 grade 1 . , ,  
 가 .  
 : 4.3% 50 가 가 , De novo 50  
 가 가 가 가 (r=0.275, p<0.05).  
 가 .

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