



14, 2, 2001 4

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. . .

&lt; &gt;

:

		1995 1	1999 12	5	50		239
218		DXA	L3				
Chi-Square							
1.	L3				$0.772 \pm 0.030 \text{g/cm}^2$		$0.732 \pm$
		$0.089 \text{g/cm}^2$			$0.720 \pm 0.031 \text{g/cm}^2$		$0.692 \pm$
		$0.002 \text{g/cm}^2$					
2.			가	가	( $p < 0.05$ ),		가
	가	( $P < 0.001$ )					
3.						( $p < 0.05$ )	
			가				
4.			(fracture threshold) 90				L3
			$0.867 \text{g/cm}^2$ (	$0.898 \text{g/cm}^2$ ,	$0.836 \text{g/cm}^2$ )		
:							

가 가 가 .  
4,9,10)

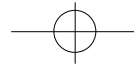
가 , 가

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371 37(606-061)

Tel : (051) 410-6846  
Fax : (051) 413-7764





258 • / 14 2

가 , ,  
50  
15% 가  
218 1,  
239 2  
3  
10  
90 percentile  
1.  
3.  
50 chi-square test  
. 50  
1995 1 (p<0.05)가  
1999 12 5  
50  
239 ( 96 , 143 )  
DXA(dual energy X-ray absorptiometry)<sup>10)</sup>  
1 가  
, ,  
50 가  
50 가 12 34 ,  
60 가 34 43 , 70 가 40  
49 , 80 10 17 가  
96 가 143 .  
218 50  
가 17 30 , 60 25 37  
, 70 27 38 , 80  
22 22 .  
(Fig.1,2).  
2.  
3. (fracture threshold)  
Dual  
2, 3, 4  
3  
3  
90 percentile  
95 percentile  
0.92g/cm<sup>2</sup> 90 percentile  
0.867g/cm<sup>2</sup>  
(0.867/cm<sup>2</sup>)  
65  
Riggs

**Table 1.** Bone mineral density(BMD) of lumbar spine in male according to age in control and fracture group.

Patient Age	Standard Level	Control		Fracture	
		No.of patients	BMD(g/cm <sup>2</sup> )	No.of patients	BMD(g/cm <sup>2</sup> )
50-59		12		17	
	L2-4		0.852 ± 0.025		0.792 ± 0.016
	L3		0.849 ± 0.042		0.797 ± 0.004
60-69		34		25	
	L2-4		0.771 ± 0.037		0.719 ± 0.038
	L3		0.776 ± 0.025		0.715 ± 0.045
70-79		40		27	
	L2-4		0.742 ± 0.011		0.699 ± 0.015
	L3		0.745 ± 0.009		0.695 ± 0.006
>80		10		22	
	L2-4		0.720 ± 0.047		0.679 ± 0.027
	L3		0.718 ± 0.088		0.673 ± 0.039
Total		96		91	
Average	L2-3		0.779 ± 0.030		0.711 ± 0.035
	L3		0.772 ± 0.041		0.720 ± 0.006

**Table 2.** Bone mineral density(BMD) of lumbar spine in female according to age in control and fracture group.

Patient Age	Standard Level	Control		Fracture	
		No.of patients	BMD(g/cm <sup>2</sup> )	No.of patients	BMD(g/cm <sup>2</sup> )
50-59		34		30	
	L2-4		0.782 ± 0.009		0.742 ± 0.047
	L3		0.786 ± 0.039		0.745 ± 0.032
60-69		43		37	
	L2-4		0.736 ± 0.037		0.692 ± 0.038
	L3		0.741 ± 0.025		0.689 ± 0.045
70-79		49		38	
	L2-4		0.714 ± 0.011		0.679 ± 0.015
	L3		0.712 ± 0.021		0.672 ± 0.006
>80		17		22	
	L2-4		0.685 ± 0.016		0.667 ± 0.027
	L3		0.689 ± 0.028		0.664 ± 0.042
Total		143		127	
Average	L2-3		0.729 ± 0.031		0.689 ± 0.030
	L3		0.732 ± 0.017		0.692 ± 0.025

가

4.

(Table1),

50

218

129

가

가

89

5

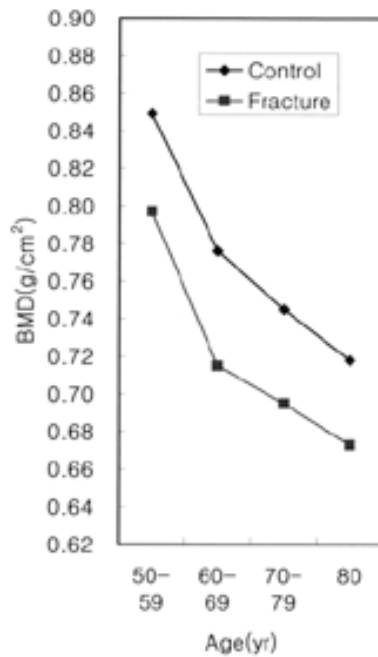
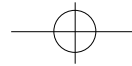
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가38 , 11

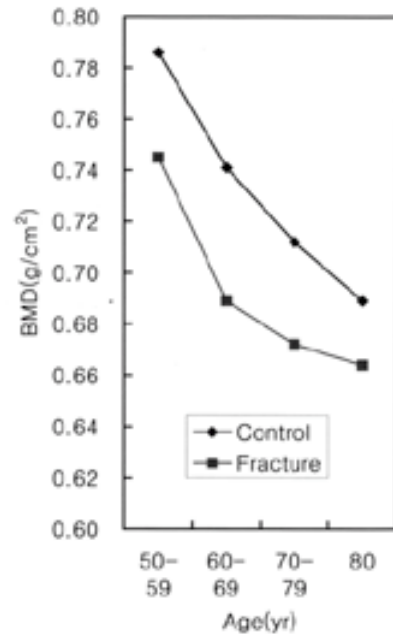
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가146 , 3

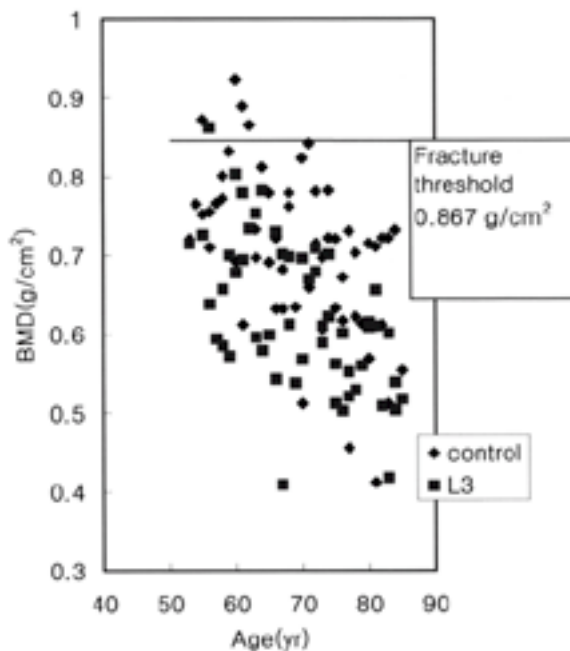
가34



**Fig 1.** Changes of BMD of L3 in male according to age in each group



**Fig 2.** Changes of BMD of L3 in female according to age in each group.



**Fig 3.** scatter diagram of BMD of lumbar spine region for control and fracture group plotted against age.

12  
67% 2  
(Fig.5.)

Estrogen

가

16)

가

1,8,17,23)

Singh's

<sup>19)</sup>, Saville's

<sup>18)</sup>,

metacarpal index,  
calcaneal index

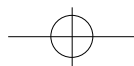


가 50 0.980gm/cm<sup>2</sup>, 60  
(QCT), 0.923gm/cm<sup>2</sup>, 70 0.866gm/cm<sup>2</sup>  
(single photon absorptiometry),  
(dual photon absorptiometry), 가  
(dual energy X-ray  
absorptiometry) , 35 50  
.50  
가 65  
cubic form  
18) Pogrud 14)  
50  
가 65  
Saville's 18)  
30 21)  
0.965gm/cm<sup>2</sup> Riggs 15) 90 percentile  
, Genant 2) 110mg/cm<sup>3</sup>  
90 percentile  
가 0.867gm/cm<sup>2</sup> Riggs 16)  
25)  
7) DXA  
20), 가 가  
11,12,13)  
가 가  
가 Morgan<sup>12)</sup> Nourton-John  
6) 40 50 17)  
가 1996 1 1999 12  
24) 50  
30-35 (1.102gm/cm<sup>2</sup>) 가 40 가  
10 4% , 40 218  
60 10 12 % DXA  
3) 가 239

**Table 3.** Details of the American Shoulder and Elbow Surgeons (ASES) Score

(4 = normal; 3 = mild compromise; 2 = difficulty; 1 = with aid; 0 = unable; NA = not available)

Back pocket	Perineal care
Wash opposite axilla	Eat with utensil
Comb hair	Use arm at shoulder level
Carry 10lb at side	Dress
Sleep on affected side	Pull
Use hand overhead	Throw
Lift	



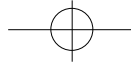
1.	0.030g/cm <sup>2</sup> ,	0.732 ± 0.089g/cm <sup>2</sup>	0.772 ±
			0.720 ±
2.	0.031g/cm <sup>2</sup> ,	0.692 ± 0.002g/cm <sup>2</sup>	가 가
		(p<0.05), 가	
	가	(p<0.001)	
3.			(p<0.005)
		가	
4.	90	L3	(fracture threshold)
		0.867g/cm <sup>2</sup> (	0.898g/cm <sup>2</sup> ,
	0.836g/cm <sup>2</sup> )		
5.			가
			가
	가		

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## Abstract

## Differences of Bone Mineral Density and Fracture Threshold Between Lumbar Spine Fracture and Control group.

Ig-Gon Kim M.D., Jae-Hyek Kim M.D.,  
Jung-Il Kim M.D. and Young-Il Hong M.D.

*Department of Orthopaedic Surgery, Hae-Dong General Hospital, Pusan, Korea*

**Purpose :** The purpose of this study was to show how bone mineral densities of the lumbar spine decrease with aging, to investigate the relationship between the bone mineral densities of the control and fracture group, and to obtain fracture threshold values.

**Materials and Method :** From January 1995 to December 1999, we measured and evaluated BMD of L3 by DXA in 239 normal volunteers(96 men and 143 women), and in 218 patients with lumbar spine fracture(91 men and 127 women) above 50 years. The Chi-Square test was used for statistical analysis.

**Results :**

1. The average BMD of L3 in control group and lumbar spine fracture group were  $0.772 \pm 0.030$  g/cm<sup>2</sup> in male and  $0.732 \pm 0.089$ g/cm<sup>2</sup> in female and  $0.720 \pm 0.031$ g/cm<sup>2</sup> in male and  $0.692 \pm 0.002$ g/cm<sup>2</sup> in female, respectively.
2. The BMD of the control group and fracture group decreased with aging( $p < 0.05$ ) and were higher in men than in women. There were statistically significant difference( $p < 0.001$ ).
3. There were statistically significant difference between BMD of the control group and BMD of the lumbar spine fracture group( $p < 0.05$ ). The BMD were higher in the control group than fracture group.
4. Fracture threshold of the lumbar spine fracture group were 0.867g/cm<sup>2</sup>(male:0.898g/cm<sup>2</sup>, female:0.836g/cm<sup>2</sup>) according to 90 percentile.

**Key Word :** Lumbar Spine, Osteoporosis, Bone mineral density, Fracture threshold