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## RESEARCH REPORT

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### Comparison of daily activities and meals in female patients with femoral fracture with women in the same age group

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**Abstract** The aim of this study was to clarify the actual conditions of daily activities and meals in female patients with femoral fracture and compare them with women in the same age group. Subjects were 50 female patients with femoral fracture (a femoral fracture group) and 50 women in the same age group (control group) whose consent had been obtained, and we investigated their daily activities and ingestion of calcium-rich foods for bone metabolism. The investigation duration was October 2005 to March 2007. For statistical processing, chi-square test was performed with SPSS. The study was approved by each participating institutional ethics review board. The average age of the femoral fracture group was 80.4 years (SD : 8.9 years), and that of the control group was 79.0 years (SD : 5.2 years), showing no significant difference. The numbers of patients with a history of fracture were 25 (50%) in the femoral fracture group and 0 (0%) in the control group, with the fracture group, being significantly large in the number. For daily activities, the numbers of patients answering that they had exposure to sunshine once daily were 40 (80%) in the fracture group and 47 (94%) in the control group, with the fracture group, being significantly small in the number. Other daily activities, unbalanced diets, dietary restriction or water ingestion showed no significant difference between the groups. For foods, only yogurt intake showed a significant difference between the groups, with the intake being larger in the femoral fracture group. The intake of milk, small fishes, etc. showed no significant difference between the groups. Women with a history of fracture have higher risk to have femoral fracture. A significant difference in amount of sun exposure was confirmed between the control and inpatient groups regarding.

*Key words* : femoral fracture, women, daily activities, meals

#### Background

The presumed number of femoral neck fracture cases is reported to be 117,900 cases according to a nation-

wide investigation in Japan in 2002<sup>1)</sup>. The majority of research in Japan focuses on outcome evaluation on bone density, though femoral fracture involves very complex factors and thus cannot be explained just in terms of bone density. Also, only a small number of researches on bone fracture factors targeting patients with femoral fracture is available.<sup>2-5)</sup>

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### Purpose

The aim of this study was to clarify the actual conditions of the daily activities and eating habits of female patients with femoral fracture and compare them with women in the same age group.

### Methods

- 1) Subjects: 50 female patients with femoral fracture (femoral fracture group) and 50 women in the same age group without femoral fracture (control group) whose consent had been obtained.
- 2) Research methods: After creating 18 question items about the activities affecting bone metabolism such as exercise, sunbath, dieting, and the food restriction and also about the ingestion of calcium-rich foods for bone metabolism, a hearing survey was conducted. Regarding exercise, whether the subjects had exercise or not and, if they did, the kinds of exercise they conducted were asked. Regarding the ingestion of calcium-rich foods, they were asked to choose one of 4 choices in relation to the frequency of consuming such foods: Everyday; 2 or 3 times a week; Once or none during the week; or Not at all. Inpatients with femur fracture were surveyed about their living situation (e.g. dietary habit, sun exposure,

exercise) before fracture.

- 3) The research period: From October 2005 to March 2007.
- 4) Analysis methods: Using SPSS for statistics, we compared between femoral fracture group and the control group in relation to their activities related to bone metabolism and ingestion of calcium-rich foods, and analyzed results using the chi-square test. The significant level was set at 5%.
- 5) Ethical consideration: This study was approved by the ethical review board of the subject hospital. The consent of the subjects was given. All possible measures were taken to protect their privacy and their information was treated with care so as to protect their dignity.

### Results

Table 1 showed the backgrounds of the subjects in the two groups. The average age of the femoral fracture group was 80.4 years old (SD : 8.9 years), and that of the control group was 79.0 years old (SD : 5.2 years), showing no significant difference. Regarding a past history of fracture, 25 subjects in femoral fracture group (50%) had such a history whereas no subject in the control group (0%) had it ( $p < 0.000$ ). This showed that the former group had a significantly large number

Table 1. Characteristics of the participants included in the analysis

Characteristics	Femoral Fracture Group n=50	Control Group n=50	p
Age (years)	mean $\pm$ SD 80.4 $\pm$ 8.9	mean $\pm$ SD 79.0 $\pm$ 5.2	
History of fracture	n (%)	n (%)	
Yes	25 (50)	0 (0)	*
No	25 (50)	50 (100)	
Unbalanced diet			
Yes	13 (26)	8 (16)	n.s.
No	37 (74)	42 (84)	
Appetite			
Yes	47 (94)	49 (98)	n.s.
No	3 (6)	1 (2)	
Food restriction			
Yes	9 (18)	8 (16)	n.s.
No	41 (82)	42 (84)	

\* $p < 0.05$  n.s. not significant chi-square test

of the subjects with a history of fracture.

Table 2 showed the comparison between the femoral fracture group and the control group in relation to daily activities and calcium-rich foods for bone metabolism according to each question item. Regarding the daily

activities, the numbers of patients answering that they exposed to sun exposure once a day were 40 (80%) in the femoral fracture group and 47 (94%) in the control group, with the former group having a significantly smaller number of such subjects ( $p=0.037$ ,  $p<0.05$ ).

Table 2. Comparison of daily activities and meals between Femoral Fracture and Control Groups.

	Question items	Category	Femoral Fracture Group	Control Group	p
			n=50 n(%)	n=50 n(%)	
Daily activities	Dieting	Yes	0(0)	5(10)	n.s.
		No	50(100)	45(90)	
	sun exposure	Yes	40(80)	47(94)	*
		No	10(20)	3(6)	
exercise	Yes	18(36)	13(26)	n.s.	
	No	32(64)	37(74)		
Foods	Milk	every day	16(32)	20(40)	n.s.
		2-3 times a week	10(20)	10(20)	
		once or none during the week	6(12)	10(20)	
		not at all	18(36)	10(20)	
	Yogurt	every day	8(16)	4(8)	*
		2-3 times a week	9(18)	5(10)	
		once or none during the week	22(44)	16(32)	
		not at all	11(22)	25(50)	
	Cheese	every day	1(2)	0(0)	n.s.
		2-3 times a week	3(6)	3(6)	
		once or none during the week	17(34)	14(28)	
		not at all	29(58)	33(66)	
	Natto	every day	2(4)	4(8)	n.s.
		2-3 times a week	3(6)	3(6)	
		once or none during the week	12(24)	11(22)	
		not at all	33(66)	32(64)	
	Bean curd	every day	19(38)	15(30)	n.s.
		2-3 times a week	22(44)	26(52)	
		once or none during the week	9(18)	9(18)	
		not at all	0(0)	0(0)	
	Soybean	every day	1(2)	2(4)	n.s.
		2-3 times a week	9(18)	15(30)	
		once or none during the week	39(78)	27(54)	
		not at all	1(2)	6(12)	
	Small fish	every day	8(16)	4(2)	n.s.
		2-3 times a week	21(42)	19(38)	
		once or none during the week	19(38)	27(54)	
		not at all	2(4)	0(0)	
Dried shrimps	every day	1(2)	1(2)	n.s.	
	2-3 times a week	3(6)	1(2)		
	once or none during the week	23(46)	30(60)		
	not at all	23(46)	18(36)		
Sesame	every day	22(46)	12(24)	n.s.	
	2-3 times a week	18(36)	23(46)		
	once or none during the week	8(16)	14(28)		
	not at all	2(4)	1(2)		
Water	frequently	33(66)	35(70)	n.s.	
	not frequently	17(34)	15(30)		

\* $p<0.05$  n.s. not significant chi-square test

The other daily activities such as unbalanced diet, dietary restriction, and water consumption showed no significant difference between the groups. Regarding calcium-rich foods, only yogurt intake showed a significant difference between the groups, with the femoral fracture group having more intake of it ( $p=0.031$ ,  $P<0.05$ ).

### Discussion

Up until today, it has been thought in Japan that exercise and meals (calcium-rich foods such as milk) are effective in preventing the decline of bone density<sup>6)</sup>. However, this research found that only yogurt was significantly eaten more in the femoral fracture group. The results indicated no significant difference between the groups in relation to the intake of milk, cheese, natto, bean curd, soybean, small fish, and sesame. This appears to be similar to the situation in Northern Europe where the incidence rate of femoral neck fracture is high despite the high consumption of milk<sup>7)</sup>.

However, as the control group had a sunbath every day, sunbath was suggested to prevent femur fracture. Moreover, apart from oral intake, vitamin D can be generated from sunbath. In Japan<sup>8)</sup>, exposure to sunlight a day is said to be sufficient. As the formation of calcium requires the ultraviolet contained in sunlight, lack of sunlight may affect the number of fracture cases in North Europe.

### Conclusion

Women with a history of fracture have a higher risk of femoral fracture. A significant difference in amount of sun exposure was confirmed between the control and inpatient groups regarding.

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