노인재활

게시일시 및 장소 : 10 월 18 일(금) 08:30-12:20 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 10:16-10:20 Room G(3F)

P 1-5

Fall risk in Korean older population according to musculoskeletal pain

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Objective

As the population is aging in Korea, interest in social loss due to falls is increasing. Musculoskeletal pain is known as a major risk factor for falls. To determine whether pain location and the total number of pain sites are associated with the occurrence of falls using the panel data that represent the elderly in Korea.

Participants and Methods

Korean Longitudinal Study of Aging (KLoSa) is a panel survey that represents all the elderly in Korea. This study used unbalanced panel logistic regression with random effects model as an analysis method. The survey data conducted in 2008, 2012, 2014 and 2016 were used as the analysis subjects. The total number of respondents in surveys conducted five times is 38,613. Those who have registered with disabilities, those who have had a history of stroke, cancer, and had a history of traffic accidents were excluded from the study. Finally, 23,335 people were enrolled as the subjects of this study. Age, gender, chronic disease possession, basic activities of daily living (ADL), mini-mental state examination (MMSE), grip strength, and body mass index (BMI) were selected as control variables. The questionnaire in survey divided the intensity of pain into four degrees (none, mild, moderate, severe), but in this analysis, it was coded to 0 (none or mild degree) and 1 (moderate to severe degree). Pain location was coded to 1, 2 and 3 based on three sites (upper limb, back, lower limb).

Results

In the descriptive statistics of control variables, the proportion of elderly people, women, those with dependent ADL, low cognitive function, weak grip strength, and those with low BMI were significantly higher in those who had fallen [Table 1]. There were 641 people who answered the survey that they had fallen in the past year. Except for the case with upper limit and back pain, odds ratio (OR) for the experience of falls was significantly increased in all cases compared to the case without pain. The greatest risk for falls was observed in persons who had 3 pain sites (OR, 3.47; 95% confidence interval, 2.21-5.46) [Table 2]. In addition, we observed a strong relationship between the number of pain areas and risk for falls [Table 3]. With all the dependent variables being held constant, the number of pain areas and the location of pain are associated with a high

risk of falling. The limitation of this study is that it is impossible to distinguish the sequence of time between pain occurrence and falling.

Conclusions

In elderly patients with musculoskeletal pain, they have a high risk of falling. Especially, when impaired cognitive function, weak muscular strength, and pain are accompanied by a skinny elderly patient, the possibility of falling is high, so be careful. Elderly patients with pain should be managed for falls beyond pain management.

Table 1. Descriptive statistics on control variables

Control variables	Mean (Range)	Standard error	95% Confidence interval	*p* value
Age				
Fall (-) (22,694 respondents)	71.66 (60-105)	0.053	71.55-71.76	< 0.001***
Fall (+) (641 respondents)	74.43 (60-99)	0.319	73.81-75.06	
Sex (Female = 1)				
Fall (-) (22,694 respondents)	0.58 (0-1)	0.003	0.57-0.59	< 0.001***
Fall (+) (641 respondents)	0.80 (0-1)	0.016	0.77-0.83	
Basic ADL (0 = Independent, 14 = Total dependent)				
Fall (-) (22,694 respondents)	0.22 (0-14)	0.009	0.20-0.24	< 0.001***
Fall (+) (641 respondents)	0.71 (0-14)	0.099	0.52-0.90	
MMSE (0-30)				
Fall (-) (21,669 respondents)	24.38 (0-30)	0.038	24.31-24.46	< 0.001***
Fall (+) (605 respondents)	22.11 (0-30)	0.262	21.60-22.63	
Grip strength (Mean value of both hands in kilograms)				
Fall (-) (19,338 respondents)	23.46 (0-55)	0.060	23.34-23.58	< 0.001***
Fall (+) (479 respondents)	19.63 (1.5-47.75)	0.336	18.97-20.29	
BMI				
Fall (-) (21,983 respondents)	23.15 (12.11-37.78)	0.019	23.11-23.18	0.004**
Fall (+) (580 respondents)	22.80 (14.10-36.11)	0.127	22.56-23.05	

P value of differences were determined by using a two sample t-test.

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 2. Panel logistic regression with random effects model for fall down risk according to pain location

Variables	Odds ratio	Robust standard error	95% CI on OR	
Control variables				
Age	1.0134	0.0083	0.9972	1.0297
Sex (Female = 1)	1.7648***	0.2635	1.3170	2.3648
Chronic diseases (Yes = 1)				
Hypertension	1.1822	0.1345	0.9459	1.4775
Diabetes mellitus	1.1187	0.1571	0.8496	1.4730
COPD	1.9603**	0.4922	1.1985	3.2065
Liver disease	0.6012	0.2664	0.2523	1.4327
Cardiac disease	0.9851	0.1873	0.6787	1.4299
Psychiatric disorder or depression	0.9930	0.2767	0.5752	1.7145
Basic ADL	1.1356**	0.0524	1.0373	1.2431
(0 = Independent, 14 = Total dependent)				
MMSE (0-30)	1.0069	0.0117	0.9843	1.0300
Grip strength	0.9718***	0.0083	0.9557	0.9883
BMI	0.9588*	0.0204	0.9197	0.9996
Independent variables (baseline = no pain)				
Upper limb pain only	3.4078***	1.1224	1.7870	6.4989
Back pain only	2.9824***	0.6414	1.9566	4.5461
Lower limb pain only	2.7708***	0.4285	2.0463	3.7519
Upper limb and Back pain	1.2317	0.9571	0.2686	5.6488
Upper and Lower limb pain	3.9187***	1.0746	2.2894	6.7075
Back and Lower limb pain	3.1681***	0.5415	2.2663	4.4287
Upper & Lower limb and Back pain	3.4669***	0.8000	2.2057	5.4494
_cons	0.0071***	0.0070	0.0010	0.0492
No of observations	18,874			
No of individuals	6,925			

* p < 0.05, ** p < 0.01, *** p < 0.001

Table 3. Occurrence of falls according to pain categories

	No. of participants	No. of respondents to fall down history		Odds ratio (95% CI)
		None	Yes	
Pain location				
No pain	16,332	16,087	245	1 [Reference]
Upper limb pain only	352	333	19	3.41 (1.79-6.50)
Back pain only	975	926	49	2.98 (1.96-4.55)
Lower limb pain only	2,367	2,241	126	2.77 (2.05-3.75)
Upper limb and Back pain	133	129	4	1.23 (0.27-5.65)
Upper and Lower limb pain	463	432	31	3.92 (2.29-6.71)
Back and Lower limb pain	1,858	1,744	114	3.17 (2.27-4.43)
Upper & Lower limb and Back pain	855	802	53	3.47 (2.21-5.45)
Number of pain locations				
0	16,332	16,087	245	1 [Reference]
1	3,694	3,500	194	2.88 (2.21-3.75)
2	2,454	2,305	149	3.19 (2.35-4.34)
3	855	802	53	3.47 (2.21-5.46)
Total number	23,335	22,694	641	

* p<0.05, ** p<0.01, *** p<0.001