

통증 및 근골격재활

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

질의응답 일시 및 장소 : 10 월 18 일(금) 10:00-10:45 Room G(3F)

P 1-100

The association between CT measurement of back muscle area and disc height change

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Background and aims

Disc height change on lumbar radiographs is one of the common indicator for intervertebral disc degeneration. Generally, disc degeneration is believed to be related with low back pain and degenerative lumbar diseases. In several imaging studies, low back pain was associated with paraspinal muscle cross-sectional surface area (CSA). The aims of this study were to evaluate the association between CSA of back muscles and disc height change (DHC).

Methods

Total 590 farmers in Gangwon-do, South Korea were recruited. Twenty-one subjects were excluded due to history of spine surgery. Total 569 subjects were included in final analysis. Two hundred and fifty-nine subjects (45.5%) were male and average age of subject was 58 years old. Spine radiograph was obtained in standing posture. A DHC was defined if there is a difference of 25% or more, with compare to two adjacent discs. The CSA of back muscle was derived from standard computerized tomography (CT) images at mid-level of L4. CSA of total abdomen, total fat, visceral fat, subcutaneous fat, total muscle, back muscle, abdominal muscle, paraspinal muscle and psoas muscle was measured.

Results

Lumbar DHCs were observed in 475 subjects (83.5%), most frequently observed in L5-S1 (69.6%). There are no significant difference of total abdomen CSA ($p = 0.063$). However, subjects with DHC were showed higher total fat tissue CSA ($p = 0.003$) and less total muscle CSA ($p = 0.031$). There was no difference of abdominal muscle CSA ($p = 0.236$). In the subjects with DHC, back muscle CSA, especially paraspinal muscle CSA were lower than subjects without DHC ($p < 0.05$). CSA of psoas muscle was different between subject with and without DHC of L4-5 disc ($p = 0.007$).

Conclusions

CSA of back muscles were significantly smaller in subject with DHC than subject without DHC. The role of paraspinal muscle morphology on the etiology, prognosis, and treatment of patients with DHC and back pain must be further investigated.

Table 1. Area measurements (cm²) in mid-level of L4 using CT.

	Control (n = 94)	DHC (n = 475)	p-value
total abdomen (cm ²)	516.1 ± 106.74	539.9 ± 114.39	0.063
total fat (cm ²)	255.4 ± 84.40	287.0 ± 94.20	0.003*
visceral fat (cm ²)	91.8 ± 38.51	105.8 ± 46.27	0.006*
subcutaneous fat (cm ²)	163.6 ± 59.61	181.3 ± 67.15	0.018*
total muscle (cm ²)	136.2 ± 30.82	128.9 ± 29.77	0.031*
back muscle (cm ²)	81.6 ± 18.89	76.5 ± 19.75	0.022*
abdominal muscle (cm ²)	54.6 ± 13.87	52.4 ± 17.19	0.236
paraspinal muscle (cm ²)	61.0 ± 13.01	56.9 ± 11.31	0.002*
psoas muscle (cm ²)	20.6 ± 7.08	19.7 ± 11.67	0.473

DHC: disc height change

Values are presented as mean±standard deviation.

*p<0.05, statistical analysis by Mann-Whitney U-test.

Table 2. Area measurements (cm²) of subjects with DHC in each lumbar disc.

	L1-2 disc			L2-3 disc			L3-4 disc			L4-5 disc			L5-S1 disc		
	Control (n = 435)	DHC (n = 134)	p-value	Control (n = 435)	DHC (n = 134)	p-value	Control (n = 435)	DHC (n = 134)	p-value	Control (n = 310)	DHC (n = 259)	p-value	Control (n = 172)	DHC (n = 397)	p-value
total abdomen (cm ²)	534.9 ± 110.28	546.3 ± 140.19	0.478	537.1 ± 114.33	529.1 ± 108.02	0.561	533.1 ± 113.63	545.3 ± 112.64	0.278	530.4 ± 118.56	542.6 ± 106.78	0.201	529.3 ± 111.91	538.9 ± 114.08	0.356
total fat (cm ²)	282.4 ± 92.21	275.7 ± 103.89	0.609	283.0 ± 94.75	274.1 ± 84.12	0.429	277.3 ± 95.21	296.3 ± 92.57	0.039*	272.1 ± 94.27	293.4 ± 91.01	0.007*	268.2 ± 87.29	287.7 ± 95.33	0.022*
visceral fat (cm ²)	103.3 ± 45.23	104.6 ± 46.83	0.843	103.5 ± 45.31	103.4 ± 45.85	0.999	102.3 ± 46.56	107.1 ± 41.10	0.290	101.4 ± 45.25	106.0 ± 45.42	0.228	98.8 ± 45.99	105.5 ± 44.97	0.110
subcutaneous fat (cm ²)	179.1 ± 65.87	171.1 ± 69.78	0.391	179.6 ± 67.35	170.6 ± 58.73	0.265	175.0 ± 64.18	189.3 ± 71.71	0.020*	170.8 ± 65.54	187.4 ± 66.06	0.003*	169.4 ± 59.75	182.2 ± 68.57	0.033*
total muscle (cm ²)	129.4 ± 29.62	136.0 ± 33.43	0.121	130.5 ± 29.53	127.7 ± 33.12	0.444	131.7 ± 30.03	124.8 ± 29.59	0.019*	134.2 ± 30.71	125.1 ± 28.49	<0.001*	134.7 ± 32.30	128.1 ± 28.82	0.015*
back muscle (cm ²)	77.2 ± 19.76	78.7 ± 19.08	0.584	77.9 ± 19.81	74.2 ± 18.69	0.120	78.7 ± 20.11	72.9 ± 17.62	0.003*	80.8 ± 21.71	73.3 ± 16.08	<0.001*	80.2 ± 19.27	76.1 ± 19.76	0.021*
abdominal muscle (cm ²)	52.2 ± 16.64	57.3 ± 16.67	0.032*	52.6 ± 16.77	53.5 ± 16.36	0.650	53.0 ± 17.14	51.9 ± 15.22	0.496	53.5 ± 18.46	51.8 ± 14.30	0.238	54.5 ± 14.86	52.0 ± 17.40	0.100
paraspinal muscle (cm ²)	57.5 ± 11.54	57.6 ± 13.16	0.945	58.0 ± 11.44	54.9 ± 12.96	0.028*	58.7 ± 11.71	53.8 ± 10.90	<0.001*	59.8 ± 11.79	54.8 ± 11.00	<0.001*	59.5 ± 13.22	56.7 ± 10.88	0.014*
psoas muscle (cm ²)	19.7 ± 11.37	21.1 ± 7.22	0.367	19.9 ± 11.54	19.3 ± 7.22	0.657	20.0 ± 11.70	19.1 ± 8.55	0.407	20.9 ± 13.66	18.4 ± 6.45	0.007*	20.7 ± 7.18	19.4 ± 12.33	0.194

DHC: disc height change

Values are presented as mean±standard deviation.

*p<0.05, statistical analysis by Mann-Whitney U-test.