P 3-29

Dysphagia is related to bone mass and fat free mass in adults with cerebral palsy

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Background
One of common disability of cerebral palsy (CP) is dysphagia which frequently results in long-standing inadequate dietary intake. Inadequate dietary intake can affect body weight, bone mass, bone mineral density, muscle mass, and fat mass in general population. However, there is no study to investigate the relationship between the severity of dysphagia and the body composition in adults with CP.

Objective
To determine whether the severity of dysphagia is associated with the body composition of adults with CP.

Design
Cross-sectional study.

Setting
University hospitals and communities for persons with disabilities.

Participants
A total of 99 adults with CP (58 men, mean age of 41.8±9.0 years) were included.

Method
The severity of dysphagia was assessed as no, mild, moderate, and severe. The body composition was analyzed using dual-energy x-ray absorptiometry. The correlation between the dysphagia severity and body weight, waist circumference, body mass index, percent body fat, trunk percent fat, android-to-gynoid fat ratio, bone mass, bone mineral density, T-score, Z-score, fat mass, and fat free mass was investigated using the Spearman correlation analysis.

Results

The severity of dysphagia was not related to age (p=0.4) or the Gross Motor Function Classification System level (p=0.06). The severity of dysphagia was related to 1) bone mass (trunk and legs), 2) fat free mass (total and legs), 3) lean mass (total and legs), 4) bone mineral density (lumbar spine, femur neck and total femur), and 5) T-score (lumbar spine, femur neck and total femur). However, the severity of dysphagia was not related to body weight, waist circumference, body mass index, fat mass, percent body fat, trunk percent fat, and android-to-gynoid fat ratio (Table 1).

Conclusion
Dysphagia in adults with CP is related to bone mass, fat free mass and bone mineral density. Dysphagia does not show relationship with well-known parameters of obesity or underweight in adults with CP.

Table 1. The correlation between the severity of dysphagia and parameters of anthropometry and body composition.

		Correlation coefficient	p-value
Body weight		-0.04	0.7
Waist circumference		0.1	0.4
Body mass index		-0.19	0.08
Percent body fat		-0.1	0.4
Bone mass	Total	-0.36 **	0.001
	Trunk	-0.25 *	0.03
	Arms	-0.16	0.2
	Legs	-0.34 **	0.002
Bone mineral content (BMC)	L1-4 spine	-0.17	0.2
	Femur neck	-0.2	0.07
	Femur total	-0.331 **	0.002
Bone mineral density (BMD)	L1-4 spine, mean	-0.25 *	0.02
	Femur neck	-0.24 *	0.03
	Femur total	-0.26 *	0.02
T-score	L1-4 spine, mean	-0.24 *	0.03
	Femur neck	-0.24 *	0.03
	Femur total	-0.29 **	0.007
Z-score	L1-4 spine, mean	-0.17	0.1
	Femur neck	-0.22 *	0.045
	Femur total	-0.25 *	0.02
Fat mass	Total	-0.1	0.365
	Trunk	-0.13	0.27
	Android	-0.1	0.4
	Gynoid	-0.08	0.5
Fat index	Android/gynoid fat ratio	-0.05	0.6
	Fat mass index	-0.7	0.5
	Trunk percent fat	-0.05	0.7
Lean body	Total	-0.26 *	0.02
	Trunk	-0.22	0.06
	Arms	-0.08	0.5
	Legs	-0.33 *	0.03
	Lean mass index	-0.14	0.23
Fat free	Total	-0.28 *	0.014
	Trunk	-0.22	0.05
	Arms	-0.08	0.5
	Legs	-0.33 **	0.003
	Fat free mass index	-0.15	0.2
Muscle	Skeletal muscle index	-0.16	0.1

*, <0.05; **, <0.01.