

암재활

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 1-89**

## **Outcome measure with bioimpedance spectroscopy in lymphedema treatment**

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### **Introduction**

We aim to analyze the correlation between inter-limb ratio (ILR) of circumference, volume and bioelectrical impedance in lymphedema patients and to reveal the usability of bioelectrical impedance analysis (BIA) in the evaluation of lymphedema, especially as an outcome measure of treatment.

### **Method**

This is a prospective study of 54 patients with cancer treatment related lymphedema (CTRL) who were admitted to a secondary university hospital for a short-term treatment. Among them, only patients who had agreed to participate in the study and have completed the complex decongestive therapy were included. Lymphedema was evaluated with BIA and circumference measure at admission and before discharge. The volume of limb was calculated from circumference measures using the formula for a truncated cone. The ILRs of circumference, volume and bioimpedance on the affected and unaffected limb were calculated. The initial and follow-up results of circumference, volume, bioimpedance and ILRs for each parameter were compared. The correlations between initial and follow-up ILRs, and changes of each ILR were analyzed.

### **Result**

Total 29 CTRL patients were included in this analysis. Follow-up results of circumference, volume, bioimpedance and ILRs of each parameter showed significant improvement (Table 1,  $p < 0.05$ ). The absolute values and change of ILR were the highest using BIA. Initial and follow-up ILRs of each parameter showed significant correlations (Table 2).

### **Conclusions**

As initial and follow-up ILRs of bioimpedance correlates with respective circumference and volume, and the absolute values and change of ILR was the highest in bioimpedance results, BIA can be used as a useful tool for outcome measure of lymphedema treatment.

Table 1. Change of evaluation parameters after complex decongestive therapy

	Initial	Follow-up	Change
Weight (Kg)	63.79±8.88	63.34±8.28	-0.55±2.37
Body fat (%)	34.62±7.74	34.76±8.18	0.14±2.15
BMI	26.03±3.38	25.62±3.17*	-0.32±0.95
Sum of circumference (Cm)			
Affected	127.18±38.84**	121.90±36.31**††	-5.22±10.729
Unaffected	117.31±35.13	116.38±34.15††	-0.95±9.56
Volume (Cm <sup>3</sup> )			
Affected	33593.12±21538.86**	30022.93±19072.64**††	-3570.20±2919.32
Unaffected	28407.81±18391.56	27110.76±17325.52††	-1296.95±1437.67
Impedance			
Affected	241.62±74.91**	271.97±68.36**††	30.36±31.90
Unaffected	322.93±63.56	333.14±55.77†	10.35±36.08
ILR (S)	1.084±0.053	1.047±0.030††	-0.036±0.031
ILR (V)	1.201±0.151	1.115±0.085††	-0.086±0.086
ILR (I)	1.406±0.303	1.262±0.204††	-0.144±0.149

\*\* p<0.01 compared to unaffected side

††p<0.01, †p<0.05 compared to initial result

ILR, inter-limb ratio; S, Sum of circumference; V, Volume; I, Impedance

Table 2. Correlation between initial and follow up inter-limb ratio of circumference, volume and bioimpedance

		Initial ILR			Follow-up ILR		
		S	V	I	S	V	I
Initial ILR	S	1.000	0.904**	0.833**	0.843**	0.756**	0.854**
	V	0.904**	1.000	0.783**	0.770**	0.867**	0.768**
	I	0.833**	0.783**	1.000	0.766**	0.705**	0.898**
Follow-up IRL	S	0.843**	0.770**	0.766**	1.000	0.845**	0.791**
	V	0.756**	0.867**	0.705**	0.845**	1.000	0.699**
	I	0.854**	0.768**	0.898**	0.791**	0.699**	1.000

\*\*p<0.01 by Spearman

ILR, inter-limb ratio; S, Sum of circumference; V, Volume; I, Impedance