

Pilot study : Treatment for localized fat and cellulite

Using Cavitation and High frequency device

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1. Purpose of experiment

With this experiment, we try to verify the effectiveness of an aesthetic device on reducing localized fat and cellulite. The hypotheses to be verified are as follows.

- 1) As the number of procedures increases, the circumference of the treated area will gradually decrease.
- 2) As the number of procedures increases, cellulite levels will gradually decrease.
- 3) There will be significant differences in subjective satisfaction with the areas of concern before and after the experiment.

2. Overview of experiment

For 7 weeks (from 06-june, 2019 to 26-july, 2019), seven healthy men and women were given ultrasound and high frequency treatment. Before and after the treatment, the circumference and the cellulite level of the treated area were evaluated to verify the treatment effect.

3. Experimental method

3.1 Selection of subjects

The subjects were seven office and production workers who worked eight to 10 hours a day. There was no restrictions on gender, age, or obesity in recruitment, those with various diseases or drugs (diabetes drugs, blood pressure drugs, contraceptives, adrenal cortex hormones and health supplements) that could affect the results were excluded from the study.

3.2 Subject instructions

The subjects visited the test site and received treatment. Also during the period, they were instructed not to take any kind of treatment or medication, sever diet control or exercise that can influence the result. Instead, encouraged to maintain their healthy activity and diet, appropriate amount of water intake and lymph massage.

3.3 Information about experiment device

We used LIPO-X(HSC, Korea) for treatment device, and to ensure the consistency of treatment, selected 1 therapist with over 3 month experience with the device to perform. Treatment was performed four times for each subjects, interval was 1 week. Selected area was treated with cavitation for 20 minutes, and high frequency coupled with vacuum for 20 minutes. Intensity level was maintained at a level tolerable for each subject, between cavitation level 5~10, vacuum level 1~3, high frequency level 5~10. Electrode of the device was closely adhered to the area and massaged while maintaining constant pressure.

3.4 Measurement and assessment

- ㄱ. To check the clinical characteristics of the subjects, our own questionnaire was used to find out their gender, age and living habits. Obesity of the subjects was assessed based on body mass index by the proportion of height and weight.
- ㄴ. The fat level for each local area was verified by the circumference. The baseline assessment was performed before the treatment, and the assessment after the treatment was made when each treatment was completed, and one week after the last treatment. To reduce the errors, the subject had to spread her feet about 10 cm in a standing position, and the weight of his body was evenly distributed to both legs. The tester measured with a constant tension using an auto-winding tape measure.

Abdomen	The middle part of the horizontal line of the iliac pole and below the last rib was measured at ease after the exhalation. * In addition, measured at the required location according to the body type.
Thigh	The maximum circumference of the thighs (the groin level) was measured horizontally from the front.

- ㄷ. Cellulite by local area was evaluated using the Modified Numberger-Muller cellular grinding scale. The baseline assessment was performed before the treatment, and the assessment after the treatment was made when each treatment was completed, and one week after the last treatment. The criteria for each grades are as follows.

Grade	Indication
1	Skin is smooth when standing. Cellulite may be induced by pinching the tissue.
2 – mild	Orange Peel or mattress mildly appear when standing.

2 - moderate	Orange Peel or mattress moderately appear when standing
2 - severe	Orange Peel or mattress severely appear when standing
3 - mild	Cellulite plus raised and depressed areas and nodules mildly appear when standing
3 - moderate	Cellulite plus raised and depressed areas and nodules moderately appear when standing
3 - severe	Cellulite plus raised and depressed areas and nodules severely appear when standing

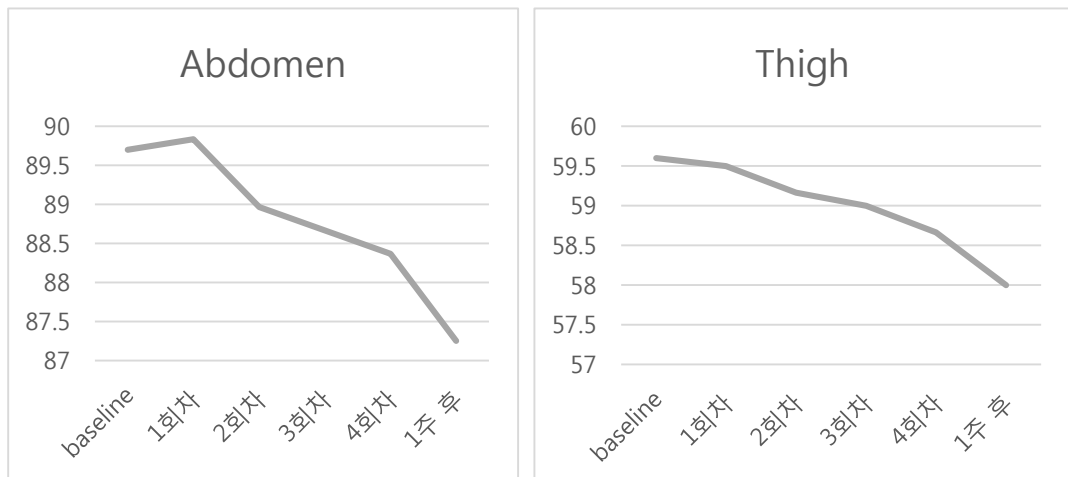
ㄹ. Objective satisfaction about local area rated with our own questionnaire using a 10-point scale. Baseline for satisfaction was rated before treatment, and re-taken after every treatment and a week after.

1	2	3	4	5	6	7	8	9	10
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4. Experiment result

ㄱ. Circumference by part

Compared to before treatment, average 2.45cm decreased for abdomen circumference (maximum 4cm) after treatment. With thigh circumference, average 1.6cm decrease (maximum 2.3cm).



ㄴ. Cellulite index

Compared to before treatment, 80% of the subjects rated 1 grade lower with cellulite index after treatment.



⌘. Subjective satisfaction index by part (10 point scale)

Compared to before treatment, 75% of the subjects rated higher with satisfaction index after treatment.



5. Conclusions

Cavitation and high frequency devices, such as LIPO-X (HSC), are used for non-invasive cosmetic treatment of skin and body line problems. Skin response and body line corrections with cavitation and high frequency have been consistently studied in relation to treatment methods of various modalities. The purpose of this report is to verify the effectiveness of the body modification with complex treatments of Cavitation and high frequency through LIPO-X equipment. Seven peoples were treated with Cavitation and high frequency using LIPO-X and evaluated on the circumference and cellulite levels, satisfactions of the treat-

-ment area before and after treatment.

After LIPO-X treatment, the average circumference and cellulite levels of the treated area were consistently reduced, and the subjective satisfaction of the subjects was increased for the treated area. There are individual differences in levels of reduction and enhancement, but the average reduction of abdomen circumference was 2.45cm, and the average reduction of thigh circumference was 1.6cm, and 80% of the cellulite assessed was reduced by one step.

6. Attachment

7-1. Characteristics of subjects (* Height : cm / Weight : Kg)

category	gender	age	Height	Baseline		1 week after last treat	
				weight	BMI	Weight	BMI
A	F	63	155	75	31.22	74	30.8(▽0.42)
B	F	61	158	70	28.04	70	28.04(-)
C	F	52	170	65	22.49	65	22.49(-)
D	F	29	169.5	63	21.93	62	21.58(▽0.35)
E	F	31	170	60	20.76	59	20.42(▽0.34)
F	F	26	160	58.5	22.85	56.5	22.07(▽0.78)
G	M	31	170	79	27.34	80	27.68(△0.34)

7-2. Measurements

ㄱ. Circumference by part (* cm)

category	baseline	1st	2nd	3rd	4th	After 1week	Remark
A-Abd.	100.5	100.5	100.3	99.5	99.2	98	▽2.5
B-Abd.	97	98	97	97	96.5	95	▽2.0
C-Abd.	93.7	93.5	93	93	92.5	92.5	▽1.2
D-Abd.	79	78.5	78	78	77.5	75	▽4.0
F-Abd.	80	80.5	78	78.5	78	77	▽3.0
G-Abd.	88	88	87.5	86	86.5	86	▽2.0
Average	89.7	89.83	88.97	88.67	88.37	87.25	▽2.45
C-Thigh	56.5	56.5	56	56	56	56	▽0.5
D-Thigh	62.3	62	62	62	62	60	▽2.3

E-Thigh	60	60	59.5	59	58	58	▽2.0
Average	59.6	59.5	59.17	59	58.67	58	▽1.6

L. Cellulite index (* Modified Numberger-Muller cellulite grading scale)

category	baseline	1st	2nd	3rd	4th	After 1week	Remark
A-Abd.	3-mode	3-mode	3-mode	3-mode	3-mild	3-mild	▽ 1
B-Abd.	3-mode	3-mode	3-mode	3-mode	3-mild	3-mild	▽ 1
C-Thigh	2-mild	2-mild	2-mild	2-mild	2-mild	2-mild	-
D-Thigh	2-mode	2-mode	2-mode	2-mode	2-mode	2-mild	▽ 1
E-Thigh	2-mode	2-mode	2-mode	2-mode	2-mode	2-mild	▽ 1

M. Satisfaction index

category	baseline	1st	2nd	3rd	4th	After 1week	Remark
A-Abd.	1	1	3	3	3	3	△2
B-Abd.	3	3	3	3	3	5	△2
C-Abd.	1	1	1	1	1	1	-
D-Abd.	5	5	5	5	7	7	△2
F-Abd.	3	3	5	5	5	5	△2
G-Abd.	3	3	3	3	4	4	△1
C-Thigh	3	3	3	3	3	3	-
D-Thigh	3	3	3	3	5	5	△2
E-Thigh	3	3	3	3	3	5	▽ 1