

CRYOLIPOLYSIS AND ACOUSTIC WAVE THERAPY

Dr Jeffrey A. Hunt and Holger Stork discuss the efficacy and results of combined CoolSculpting and ZWave therapy for faster fat absorption



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Background Objective Cryolipolysis treatments are normally performed for 60 minutes followed by a vigorous massage. It takes a few weeks for the adipocytes to break down and begin absorbing. For this reason there is a 2-month wait before a second treatment can be carried out. The objective of this study was to combine weekly acoustic wave treatments (using the ZWave system by Zimmer MedizinSysteme) to see whether it was possible to speed the rate of fat absorption to allow shorter treatment intervals.

Study Design In a randomised controlled study, five female patients were assigned to group A with CoolSculpting® and initial massage immediately followed by ZWave and then four ZWave treatments weekly. Another five female patients were assigned to group B with CoolSculpting and initial massage only. Weekly weights and ultrasound measured fat thickness were assessed at baseline and at 1, 2, 3, 4 and 8 weeks.

Results The average fat reduction in both groups A and B were calculated on a weekly basis for 4 weeks and then at 8 weeks. Group A with ZWave treatment had over twice the fat reduction during each week, from week 1 to week 4, when compared with group B. Over 75% of the fat reduction achieved at 8 weeks was realised at the week 4 visit. The fat reduction of group B was slower and much more gradual. Patients were not placed on a diet and the weights for both groups were relatively stable. Weight loss was -1.2lb for group A and -1.5lb for group B at week 4. At week 8, weight loss was -1.5lb for group A and -0.5lb for group B.

Conclusions 3-minute acoustic wave treatments immediately after cryolipolysis and weekly for 3 more weeks results in twice the rate of fat absorption. This should allow monthly CoolSculpting treatments and body contouring results in half the time. Whether or not additional fat was destroyed was not determined by this study owing to its 2-month follow-up.

Cryolipolysis has been evaluated in animal studies¹, and it has been shown that increased duration of cold or more extreme cold results in more fat destruction. This fat destruction² occurs gradually over 3 months. To minimise adverse side-effects it is necessary to limit the cold severity and duration. It is general protocol to wait 2 months to retreat an area for further fat destruction, as it requires this much time for most of the damaged adipocytes to absorb. It has been shown³ that there is more fat destruction if, immediately after cryolipolysis, the area is vigorously massaged. Massage capabilities in different offices vary considerably and there have not been any studies on repeated massages to the treatment areas. For this reason, the authors attempted to standardise shockwave treatment to the treated areas for 3 minutes immediately

after cryolipolysis and at weekly intervals over 4 weeks.

Methods

Ten patients were randomly assigned to one of two groups: one for acoustic wave treatments, and the other for vigorous massage during the first treatment only. The fat layer

thickness was determined by use of MyLab Five ultrasounds with a gel standoff. The thickest area of fat in the centre of the treated area was measured on each side of the abdomen. The ultrasound techs were blinded as to the patient groups. After each measurement the patients were either weighed, or

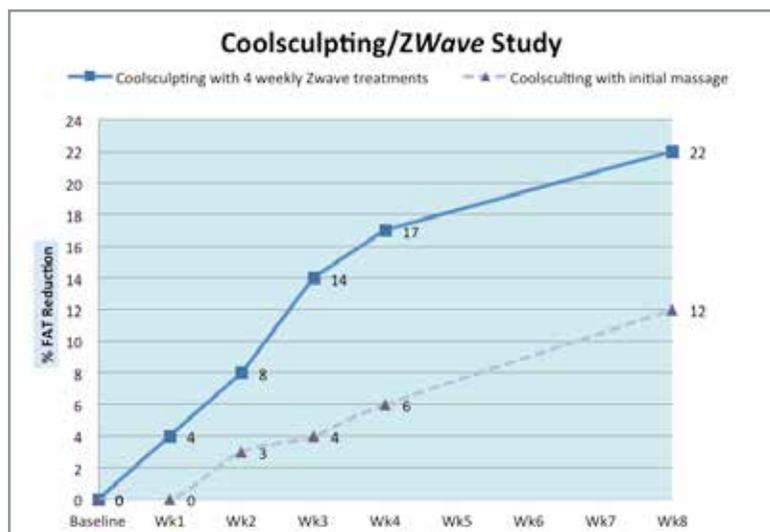


Table 1. Group A with ZWave

Right Side	Baseline	Wk 1	Wk 2	Wk 3	Wk 4	Wk 8
MR	3.79	3.68	3.64	3.41	3.37	3.31
TF	4.7	4.67	4.47	4.25	3.95	3.49
JW	3.2	2.96	2.84	2.63	2.59	2.38
AW	2.72	2.52	2.42	2.04	1.84	1.65
SL	3.68	3.30	3.24	3.24	3.17	3.12
Left Side	Baseline	Wk 1	Wk 2	Wk 3	Wk 4	Wk 8
MR	3.80	3.79	3.64	3.57	3.36	3.30
TF	4.65	4.62	4.43	4.26	4.19	3.96
JW	3.23	3.20	2.97	2.64	2.62	2.42
AW	2.79	2.63	2.33	1.98	1.77	1.45
SL	3.95	3.63	3.54	3.49	3.44	3.43
AVG % Fat Reduction	0%	4%	8%	14%	17%	22%

Table 2. Group B without ZWave

Right Side	Baseline	Wk 1	Wk 2	Wk 3	Wk 4	Wk 8
MG	6.56	6.64	6.37	6.36	6.13	6.10
TS	3.86	3.85	3.74	3.73	3.64	3.56
JM	3.55	3.50	3.47	3.40	3.27	3.20
TP	3.26	3.19	3.08	2.93	-	2.55
MO	3.02	3.01	-	-	2.74	2.36
Left Side	Baseline	Wk 1	Wk 2	Wk 3	Wk 4	Wk 8
MG	6.20	6.31	6.19	6.17	5.93	5.90
TS	3.67	3.64	3.58	3.54	3.52	3.46
JM	3.41	3.40	3.38	3.28	3.22	2.93
TP	2.98	2.89	2.84	2.82	-	2.37
MO	3.05	3.02	-	-	2.79	2.46
AVG % Fat Reduction	0%	0%	3%	4%	6%	12%

weighed and given a 3-minute acoustic wave treatment. The acoustic wave system used was the ZWave by Zimmer MedizinSysteme and settings were at 16 Hz and 90 mJ for 2500 pulses, which takes approximately 3 minutes.

Results

As described in the literature⁴, the CoolSculpting treatments were well tolerated by the 10 subjects. There was minimal discomfort from adding the acoustic wave treatments initially, as it was comparable to the vigorous massage. As shown in *Tables 1* and *2* the fat thickness was recorded for each patient at baseline and at 1, 2, 3, 4 and 8 weeks. The average fat reduction percentage was then plotted on a graph showing superior fat reduction with the combination treatment: 77% of the 8-week fat reduction was achieved at the 4-week level in group A.

Discussion

This study was designed to see whether there was a way to speed up fat absorption and shorten the interval between CoolSculpting

treatments. The combination treatment group appeared to also have less post-procedure discomfort, which may be reflected by faster resolution of the damaged adipocytes, and perhaps less inflammation. The authors believe there are multiple advantages to weekly acoustic wave treatments. Weighing the patients weekly seems to make them less likely to gain weight. The shortened interval gives quicker results and more patient satisfaction. The authors believe this will result in more treatments being performed.

When multiple areas and repeated treatments are done, it is possible to get the 'WOW' results that patients desire. It would be interesting to evaluate post-procedural pain on a weekly basis to see whether there is a clinically significant difference between the two protocols, which the authors believe there is based on patient comments. It would also be of value to follow and measure the fat reduction at the 3-month level to see if the combo treatment percentage of fat reduction is higher. Whether or not more acoustic wave

pulses per treatment would result in further benefit has not been assessed.

Conclusions

The use of weekly acoustic wave treatments as an adjustment to cryolipolysis causes fat reduction at twice the normal rate for the first 4 weeks. This allows cryolipolysis treatments on a monthly schedule and body contouring results in half the time. More studies need to be performed to pool data and see whether more fat per treatment is eliminated by combining cryolipolysis and acoustic wave therapy.

Declaration of interest Holger Stork is an employee of ZimmerMedizinSysteme

References

1. Manstein D, Laubach H, Watanabe K, Farinelli W, Zurakowski D, Anderson RR. Selective cryolysis: a novel method of non-invasive fat removal. *Lasers Surg Med* 2008; 40(9): 595-604
2. Nelson AA, Wasserman D, Avram MM. Cryolipolysis for reduction of excess adipose tissue. *Semin Cutan Med Surg* 2009; 28(4): 244-9
3. Boey G, Wasilenchuk J, Preciado J. Effect of post-treatment manual massage on efficacy following a cryolipolysis procedure. Abstract #50 *Laser Medicine and Surgery*, 2012
4. Dierickx CC, Mazer JM, Sand M, Koenig S, Arigon V. Safety, tolerance, and patient satisfaction with noninvasive cryolipolysis. *Dermatol Surg* 2013; 39(8): 1209-16