

Title page

Title :

Schwarzy: The new system for muscle toning and body shaping

Authors:

Paolo Mezzana MD, Ph.D. 1

Laura Pieri Ph.D. 2

Alessandro Leone, MD 3

Irene Fusco, Ph.D. (ORC ID: 0000-0001-7264-8808)

Institutional affiliations:

¹ Plastic Surgery Department, Delle Medical Center, Rome, Italy

² Biologist-Florence – Italy

³ Dermatos center, via Vestina 216, Montesilvano, Abruzzo, Italy

Corresponding author: Irene Fusco, University of Florence, Florence, Italy. (ORCID: 0000-0001-7264-8808). irene.fusco@unifi.it. Phone number: 3286853105

Authors email-adresses:

pmezzana@gmail.com

laura_pieri@virgilio.it

alessandroleone85@gmail.com

irene.fusco@unifi.it

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/JOCD.14275](https://doi.org/10.1111/JOCD.14275)

This article is protected by copyright. All rights reserved

Conflict of interest: no conflict of interest to declare

Financial disclosure: No funding or sponsorship was provided for this study

DR. IRENE FUSCO (Orcid ID : 0000-0001-7264-8808)

Article type : Letter to the Editor

Title: Schwarzy: The new system for muscle toning and body shaping

Running head: Muscle-toning device

Keywords: Muscle toning, body shaping, electromagnetic field

To the Editor:

High-intensity focused electromagnetic (HI FEM) field technology has been introduced in the realm of aesthetic medicine to offer physicians a tool for muscle toning. It is possible to hypothesize that electromagnetic stimulation can be applied for body remodeling, as it has already been shown that it is able to strengthen muscles^{1,2} and that an intensive muscle training induces lipolysis^{3,4}. During the application of HI FEM, the frequency of the impulses does not allow the muscle to relax between two consecutive stimuli, which results in a supramaximal muscle contraction. In this preliminary study we evaluated the safety and efficacy of Schwarzy by DEKA: This is a totally new approach to body remodeling. The technology used is FMS (Focused Magnetic Stimulation); this technology is capable of making a muscle move independently from the commands given by the brain. A set of 20 patients (BMI 22.4 ± 3.2 kg m⁻², age 20-47) participated in this study. 6-8 treatment sessions were performed. The FMS device is equipped with a circular coil that is located inside the applicator, at which level an alternating electric current is created generating in turn electromagnetic pulses with an intensity up to 2.5 Tesla (T). Pulse repetition frequency was 1-150 Hz and Pulse duration was $250 \mu\text{s} \pm 20\%$. The sessions must be repeated twice a week, with a minimum of two days between each session as specified in the protocol approved by the Institutional Review Board and in conformity with the ethical guidelines of the Helsinki

Declaration (1975). Treatment duration varies from 20 to 45 minutes, depending on patients. The treatment was performed on the patients' abdomen using a Focused Magnetic Stimulation device (Schwarzy, DEKA). In order to assess the efficacy of the treatment, weight and waist circumference measurements were performed. Frontal digital photographs were also taken before treatment and 1 and 3 months after the last treatment (see Figure 1 and 2). A written patient consent was released and archived. Generally, the effect lasts 3-6 months after completion of a treatment cycle. Patient satisfaction after treatments was evaluated using a 5 - Likert scale questionnaire. Paired T-test was used to analyze data. Statistical significance is accepted to be $p < 0.05$. Data is shown as means \pm standard deviation (SD). To measure abdomen waist circumferences, a flexible but inelastic anthropometric tape was used. The study protocol was completed by all patients, who underwent visit evaluation after 1 month and 3 months from treatment. During the 1 and - 3month follow-up evaluations, there is a significant reduction in mean waist circumference: (mean baseline 87.9 ± 13.4 cm vs mean 1-Month FU 85.6 ± 14.7 cm, $p < 0.05$), (mean baseline 87.9 ± 13.4 cm vs mean 3-Month FU 84.8 ± 14.6 cm, $p < 0.05$). The results showed tonification, the strengthening of muscles, and the reduction of localized adiposity; the device is able to reproduce the same metabolic effects by offering strengthening results, muscle toning and firming of affected areas. No significant weight change for all patients was reported. An aesthetic improvement and a reduction in the abdominal area were shown through digital photographs. All patients show high treatment satisfaction. The treatment proves to be bearable because there is no dermo-epidermal interaction with electromagnetic fields and the liquid cooling system of the handpieces prevents the warming of the treated area and painful sensations. No adverse events were recorded during all the treatment period. The only side effect found was muscle fatigue, which was resolved within 48 hours. The results indicate that intense muscle activity is induced during the FMS treatments and suggest this technology could be used as a convenient and effective muscle toning tool.

Data availability statement

The data that supports the findings of this study is available from the corresponding author upon reasonable request.

References:

1. Han TR, Shin HI, Kim IS. Magnetic stimulation of the quadriceps femoris muscle: comparison of pain with electrical stimulation. *Am J Phys Med Rehabil*. 2006;85(7):593–599.
2. Abulhasan JF, Rumble Y, Morgan ER, Slatter WH, Grey MJ. Peripheral electrical and magnetic stimulation to augment resistance training. *J Funct Morphol Kinesiol*. 2016;1(3):328–342.
3. Chatzinikolaou A, Fatouros I, Petridou A, et al. Adipose tissue lipolysis is upregulated in lean and obese men during acute resistance exercise. *Diabetes Care*. 2008;31(7):1397–1399.
4. Ormsbee MJ, Thyfault JP, Johnson EA et al. Fat metabolism and acute resistance exercise in trained men. *J Appl Physiol Bethesda Md 1985*. 2007;102(5):1767–1772.

Legend 1

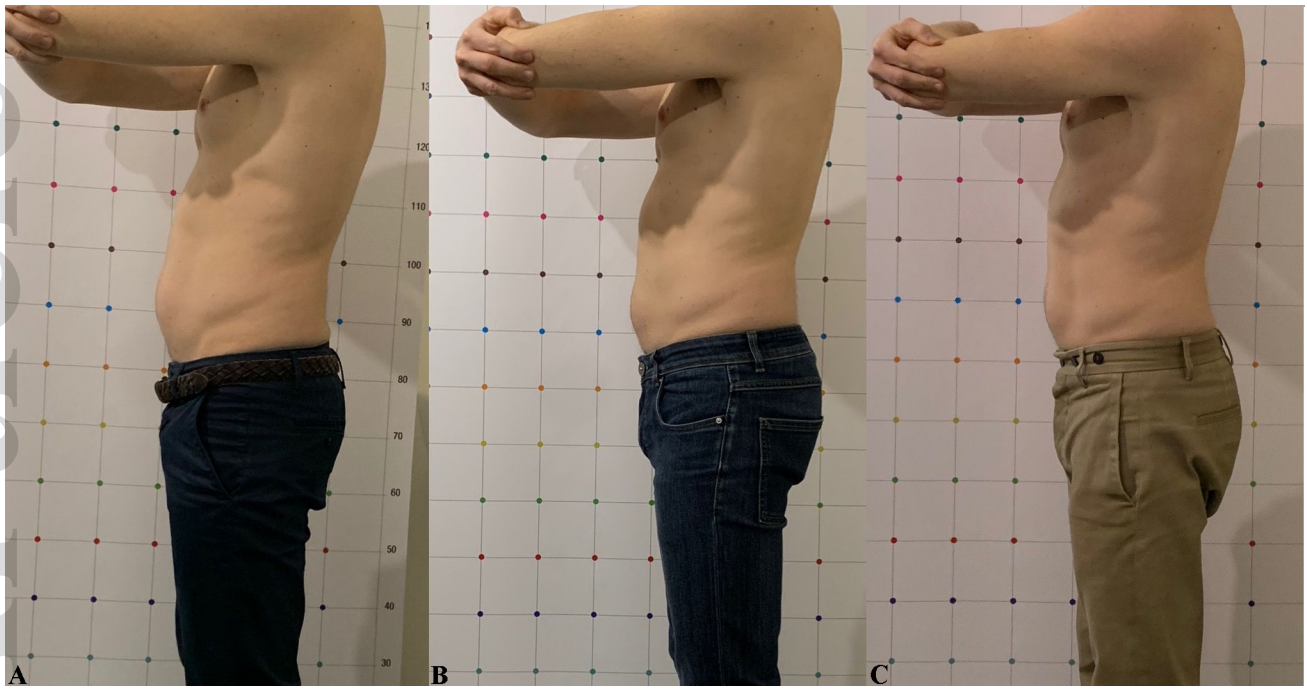
Figure 1. Frontal view of a patient before the treatment (A), 1 month after the last treatment (B) and 3 month after the last treatment (C). A volumetric reduction in the abdominal area is shown.

Legend 2

Figure 2. Lateral view of a patient before the treatment (A), 1 month after the last treatment (B) and 3 months after the last treatment (C). A volumetric reduction in the abdominal area is shown.



jocd_14275_f1.tif



jocd_14275_f2.tif