Consider of Micro-Current's effect to variation of Facial Wrinkle trend

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Abstract: Introduction: Beauty is one of the important today's people concerns; the facial wrinkles are including problems of beauty. Today, new non-invasive treatments such as using micro currents in treatment of wrinkles and skin renewal, have been used. This study is aimed to determine the effect of Micro-Current in the treatment of facial wrinkles. **Methods:** in this before and after clinical trial, thirty women with three requirements; 1.having less than 45 years of age 2.wrinkles and 3.no skin problems have participated. The cases were treated with micro current for twenty minutes on their face areas, for thirty consecutive sessions. Photos were taken from patients faces at the beginning, end and one month after treatment. Three independent blinded reviewers have rated wrinkles in photos. Also patients have evaluated their treatment. **Results:** The best results belonged to forehead 18.37% in first step (before and after treatment) and 21.18% in second step (after treatment and one month later) and the lowest rate in treatment belonged to nose and mouth region; 7.61% in first step and 5.85% in second step. **Conclusion:** Micro current, recovers facial wrinkles, this recovery was better in the frontal area comparing the nose and mouth. Also comparing the scores of photos, immediately after treatment and one month later shows that not only the effect of treatment has been stable but also the started recovery procedure has been continued after treatment. Treatment satisfaction among patients was over 70%.

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Introduction:

Beauty is one of most common concerns among human, especially women. Facial wrinkles are one of beauty problems which is produced due to aging or some other factors such as stress, improper diet, smoking, sun damage, fat culmination, and harmful inflammation, and is accelerated due to some other factors including gravity, broking of Collagen and Elastin constitutive materials caused by sunshine, air pollution, smoking, and not to exercise, and signs of aging begin to appear. Passing time, the thin epidermis and connect tissue become weak, facial muscular firmness diminishes, epidermis begin to loose and dropping, natural fold change to cheek, neck, and chin unnatural fat, small vessels tights and blood circulation decreases and lead to decrease of facial brightness (1,2).

There are many therapeutic methods to remove and reduce facial wrinkles and for rejuvenation which can be divided into three group of invasive, semi-invasive, and non – invasive methods.

The invasive methods such as facelift treatment or the cosmetic surgery are intended to remove facial wrinkles. These methods require hospitalization, and besides being expensive and having long recovery period and may cause side effects.

Among semi -invasive methods,there is use of laser to skin exfoliation, which requires special care after treatment and long recovery period, it also cause respective problems, costs, and side effects(3).

Injection of botulunim toxin also known as Botox is another semi invasive method to remove facial wrinkles. The method may have many dangers associated with misuse, but under supervision of practitioner and use of healthy Botox the side effects reduce. Also treatment effects are not long standing.

Non-invasive methods include preservative creams, booster creams, and anti wrinkles creams. These are contain of, antioxidant, preservatives, or booster ingredients such as vitamin A, hydroxy acid, α- lipoic acid, Q-10 coenzyme, cu peptides, growth factors, Soy Isoflavones, Tea extract, vitamin C, vitamin E, or collagen. However the effectiveness of the creams has not been proved yet.

In recent years, the use of micro current has been proposed which enjoys many advantages including: being non –invasive, inexpensive, and having no side effects. It is also argued to be effective in removing facial wrinkles, skin dropping and reducing facial surface spots. It also has been proved that micro currents are very effective in improving of malunion or nonunion bone fractures and curing of resistant ulcers and bed sore.This occurs due to activation of collation system in skin layers. Collagen is a group of naturally occurring proteins found in animals. They are made from fishia strings, making up about 40% of the whole-body protein content. Collagen protects brain nerve system and provides good tensile strength. It also leads to sore recovery through a complex process. During maturation and ulcer recovery, collagen is arranged in line with tensile lines and the unneeded cells are removed by fagositosis, thereby the ulcer recovers (10). Micro current is an electric current delivered at a rate of 1 microampere which equals 1 millionth of an ampere. They are harmless and have recovery effects on damaged tissues and enjoy capacity of toxic trapping. They made blood circulation faster and lead to stimulation of collagen production. Several studies have proven benefits of micro currents for recovery of persistent and chronic ulcers (12). Micro currents are at low level and patient feel comfortable.

Stimulator current above 20 mille ampere, stimulate and contract the muscles leading to strength and firmness of damaged muscles. Common electrodes such as TENS and EMS are reliable and nonallergic. These currents can be used as interferential with sine and square waves, and are more effective because they allow a deeper and softer penetration (13).Currents' effect lead to increase of the amount of ATP in cells (14), increase of cell protein duplication and DNA transcription (15), horn cell growth and duplication, increase of blood flow, exchange of oxygen, ions, antioxidants, and nutrients among epidermal, subcutaneous and fat layers, and subcutaneous and lymph capillaries.This lead to release of energy in tissues and stop decreasing elasticity and protein degradation which had been caused by intake of free radicals and to increases collagen I,II production. (17) By contracting the old and unhealthy collagens, these changes lead to firmness and toning of facial skin.

It seems that the ability of micro currents in resurfacing of thin layer of skin, filling wrinkles and lifting dropping skin is related to stimulation of cells growth and tissues revivals. (18).This study aims to determine the effect of micro current on removing and reducing patient's facial folds and wrinkles.

Materials and Methods: In this before and after clinical trial, every volunteer participated in the research after being informed about the trial and it was conducted in second half of 2010. Sampling was as available goal – oriented sample with volume of 15 subjects. Regarding to a similar study (21-19), limitation of the research, and because of some consideration like possible fail due to time period, and respective problems, 30 women were participate in the research. At the first, at the end and one month after treatment, in the same conditions, photos were taken from areas of right /left eye profiles, forehead front, nasolabial, and eyes feet views. The photos were taken using Canon 5D camera with lens 24105 macro while the participant was sitting in a free mode relying on her head back on chair. The treatment process was as follows: first the person washed her face with soap and water, and then lied on bed and every half of her face was treated for 10 minutes.

Facial areas going under treatment include forehead around eyes, nasolabial area, cheeks and chin. The treatment method is as follow: a positive electrode is fixed and the negative one is sliding. These movements are repeated five times for each point. These electrodes are thin with a tip covered with cotton that are wetted with water to be conductive. For every case, treatment proceeds for 30 consecutive sessions except for vacations, Thursdays and Fridays. The used apparatus A6 is made in China with CE license from England and Europe and United states. The current used in the study are square micro pulse between 70-80 Hertz with amperage range of 0-640 microampere. At the end of the treatment, the consent assessment form about treatment effectiveness, health care center quality staff services and treatment environment was filled by the patients. The questionnaire was prepared using standard form (25) and enjoyed acceptable validity and reliability. At the end of the plan all photos were numbered and each photo was graded between 0-10 by two dermatologists

and one plastic surgery specialist by size numbers and depth of folds. The referee was blind on which one is before or after photo and about the related person. The assessment method enjoys acceptable validity and reliability (26).

Inclusion Criteria: being below 45 years old, having facial wrinkles, being free of skin problems diagnosed by dermatologist.

Exclusions Criteria: If any case of complication happens the patient is referred to the practitioner and then leaves out the study. During the study patient should avoid anti-wrinkle cream or any other wrinkle therapy.

Data analysis: To describe data central and dispersion indices and for data analysis the paired student's t- test were used. To assess the improvement rate or treatment effectiveness on each stage and area we used ratio of difference of before/after wrinkles scores to before score on that stage and area.

Ethics consideration: The aim of the study was explained for the volunteers and they were informed. The micro current is in common use in physiotherapy and their harmlessness has been confirmed. The unanimous photos were coded and evaluated by the referees. The confidentiality of collected information was observed and patients feel comfortable and didn't incur any expenditure.

Findings: This study aims to investigate the effects of micro currents on removing facial wrinkles and was conducted as a before /after trial study. This study consists of 30 women residing in Yasuj and suburbs which last 7 months beginning from 23th Oct 2010. Due to length of the study, 25 women completed the therapy period and despite of our follow up, only 19 women referred for photography, one month after treatment. Age mean and standard deviation of patients were 37/5 _+4/6(25-45). Evaluation of wrinkles of forehead areas, right/left eyes' profiles, eyes front and nasolabial area and face as a whole, indicated the significance of the study. The forehead area show the greatest improvement(%18/37) in the first stage (before treatment and after completion of the study) and %21/18 in the second stage (after treatment one month later). The nasolabial area constituted 7/61 percent of improvement (minimum improvement) in the first stage and 5/85 percent in the second stage(table 1).

Also 70% of patients were satisfied with their treatment results (table 2).

Discussion and conclusion: In this study, the effect of micro currents on removing and reduction of facial wrinkles after 30 treatment sessions was significant. The improvement rate was greatest in the forehead area and was the least in nasolabial area. This was perhaps due to possibility of more effective use of the apparatus in the forehead area than the other areas. On the other hand, the tissue texture of forehead has more improvement capability. On the forehead after one month improvement continues significantly. In the right eye and left eye of the profile and eyes of the face both of them t treatment's affect is significant, But, the second stage is less effective. Overall, the treatment effect was significant in both stages.

Also, comparing scores after treatment and one month later shows that not only effect of treatment was sustained but also recovery in the face of the subjects started and has continued.

An important finding in this study was improvement of scars, acnes (especially infectious acnes) and skin rashes in the face of subjects.

Limitation: Regarding problems and limitation of the study and its being novelty in Iran, there was no chance to compare the results with studies of domestic ones. The therapy period (30 sessions) and length of every session (equal 40 minutes with preparation of the patient) caused the slow progress of the research execution.

1-Regarding cultural bound photography of the intended areas by a professional photographer was not possible, so the photos were taken by the researcher.

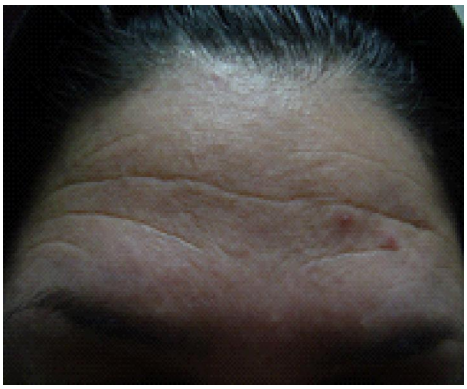
Table 1: Compare Wricle Scores of Patients faces area In the first stage(Before and after treatment) and second stage(After treatment and one month later) of trteatment.

Row	Face Area	Stage of Treatment	Number	Before mean±SD	After mean±SD	The recovery rate	P Value
1	Forehead	Stage 1	25	1.80± 3.92	1.55± 3.20	18.37%	0.0001
2		Stage 2	19	1.59± 3.21	1.68± 2.53	21.18%	0.0001
3	Half the right eye	Stage 1	25	1.56± 3.76	1.49± 3.08	18.09%	0.0001
4		Stage 2	19	1.58± 3.11	1.32± 2.79	10.29%	0.0001
5	Half the left eye	Stage 1	25	1.58± 3.56	1.54± 3.08	13.48%	0.001
6		Stage 2	19	1.67± 3.01	1.46± 2.79	7.31%	0.028
7	Mouth and nose	Stage 1	25	1.41± 3.68	1.38± 3.40	7.61%	0.032
8		Stage 2	19	1.43± 3.42	1.40± 3.22	5.85%	0.104
9	The eyes front the face	Stage 1	25	1.77± 3.96	1.69± 3.52	11.11%	0.001
10		Stage 2	19	1.70± 3.68	1.64± 3.37	8.42%	0.055
11	Face area (Totally)	Stage 1	25	1.77± 3.79	1.69± 3.52	7.12%	0.0001
12		Stage 2	19	1.70± 3.58	1.64± 3.37	5.86%	0.021

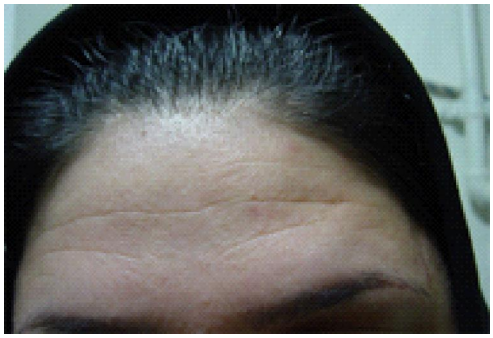
Table 2: Patients satisfaction of their treatment results and treatment center factors

Row	Discution	Mean ± SD	Not very satisfaction %	very satisfaction %
1	Your satisfaction about decreasing the depth of wrinkles	3.95 ± 1.05	37	63
2	Your satisfaction about reduce the length of wrinkles	3.60 ±1.04	50	50
3	Your satisfaction about diminish wrinkles away	3.85 ± 0.74	44	56
4	Your satisfaction about loss of skin spot	3.90 ± 0.91	37	63
5	Your satisfaction about skin tightness	3.45± 1.36	52	48
6	Your satisfaction about lighting skin	3.95 ± 0.83	31	69
7	Your satisfaction, about loss of acne and acne scars on the skin	3.35 ± 0.87	57	43
8	Your satisfaction about the loss of scar	3.35 ±0.87	60	40
9	Your satisfaction about closing the pores on your face	3.95 ± 0.82	46	54
10	Your satisfaction about soften of your skin	4.30 ±0.73	11	89
11	Your satisfaction about Fluoresce of your skin	4.2 ±0 0.76	21	79
12	Your satisfaction about rejuvenating	3.35 ±0.74	59	41

1. Before treatment

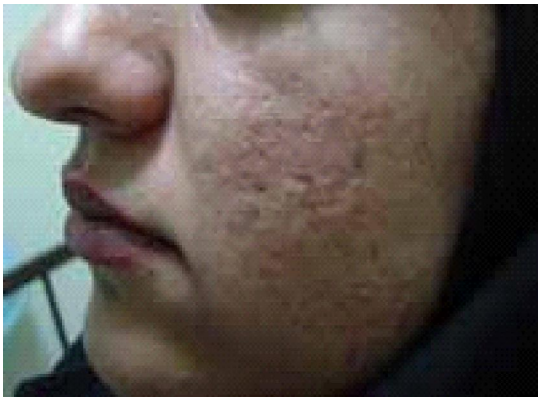


2. After treatment

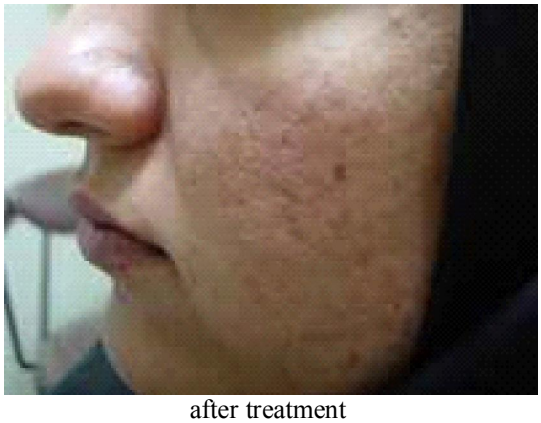


3. One month later.

Figure 1: Wrinkles, a patient before treatment - after treatment and one month later.

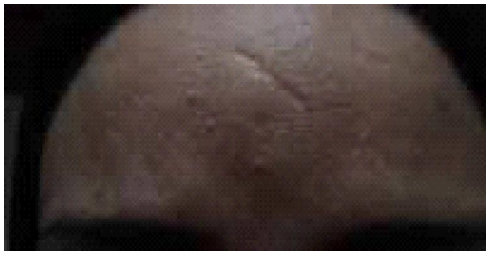


Before treatment

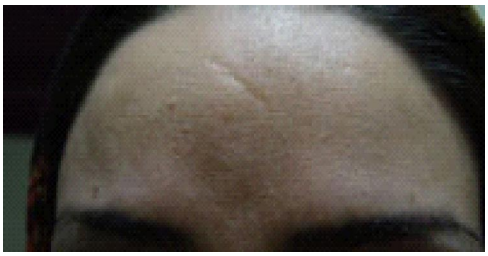


after treatment

Figure: Significant improvement in treatment acne and infectious acne



Before treatment



After treatment

Figure 3: significant improvement in scaring

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Conflict of interest:

The authors, certify that there is no actual or potential conflict of interest in relation to this article.

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