

## PATIENTS AND METHODS

### Patients:-

Ninety patients were selected among those attending the out patient clinics of Dermatology and Andrology of Benha and Tanta University Hospitals during the period between January 2005 to October 2005. They were selected to have either melasma (thirty patients), acne vulgaris [noninflammatory lesions, inflammatory lesions, and acne complications in the form of pitted scars or postinflammatory hyperpigmentation] (thirty patients) and fine wrinkles (thirty patients). All patients had skin phototype III-IV according to Fitzpatrick classification (Φιτζπατριγκ, 1988).

Exclusion criteria for all patients included; photosensitivity, history of keloid formation, history of poor wound healing, immunosuppression, renal or hepatic failure, history of recurrent herpes simplex, previous chemical peeling in the last six months, dermabrasion or isotretinoin therapy in the past year (Ροβνι, 1998).

All the ninety patients were treated with superficial chemical peeling using either trichloroacetic acid (TCA), glycolic acid (GA), or amino acid filaggrin based antioxidant (AFAs). Accordingly patients were classified into three groups:

**Group I:** Included thirty patients treated with Trichloroacetic acid (TCA) (15%:35%).

**Group II:** Included thirty patients treated with Glycolic acid (20%:70%).

**Group III:** Included thirty patients treated with amino acid filaggrin based antioxidants (AFAs).

According to the type of the targeted disease each group was subdivided to three subgroups each one included ten patients from each of targeted diseases (melasma, acne vulgaris and wrinkle) as the following:

**Group A:** Included ten patients with melasma.

**Group B:** Included ten patients with acne vulgaris.

**Group C:** Included ten patients with fine wrinkles.

#### METHODS:

1- **Detailed history** was taken from each included patient with special attention to the fulfillment of the exclusion criteria.

2- **Thorough clinical and dermatological examination was done for each patient as follows:-**

##### **I- Melasma patients**

Melasma was determined by:

a- Clinical examination to detect

- Epidermal type usually light brown.
- Dermal type usually blue brown.
- Mixed type usually dark brown (Πιμπηγοστ, 1998).

b- Woods lamp examination to detect epidermal and dermal types (Σανχηεζ, 1981).

##### **II-Acne patients**

Patients complaining of inflammatory (papules and pustules), noninflammatory acne (comedones) and acne complications (postinflammatory hyperpigmentation and acne scars) were included. They were evaluated according to the change in the number of lesions ( papules, pustules, comedones, pitted scars and post inflammatory

hyperpigmentation) before and after treatment (Λιδεν ετ αλ., 1980 & Ωιτκοωσκι ανδ Παριση,2004) .

### **III-fine wrinkles patients:**

Patients complaining of fine wrinkles whether (periorbital) or (forehead) were included in this study and they were subclassified according to Glogau classification into four categories according to severity of photodamage (Γλογαυ, 1994).

- 3- After the potential risks, side effects and benefits were explained to all patients, an informed consent was obtained from every included patient.
- 4- **Course of treatment:** Each one of the included patients in this study received six weekly sessions then monthly session during the follow up for about 3:6 months (average 4 monthly sessions).
- 5- Patients were re-examined and photographs were taken for every patient in the first, third and sixth sessions and during follow up after one month, three months and six months to document the pretreatment skin lesion and the changes after aesthetic procedures. **Photographs** were taken on basic principles [lighting, exposure, aperture, camera type, white balance, lens focal length, and patient positioning] pertinent to accurately document photographic changes (Σηαη ετ αλ., 2005).

### **6- Therapeutic regimen and follow up:-**

#### **Pretreatment instructions**

All patients were instructed to:

- ⊗ Avoid previous treatment of the same disease for at least one month before the first peel.

- ✎ Avoid topical tretinoin, hydroquinone or any other drug from those used in the preparation of patients in chemical peeling to ensure accurate evaluation of efficacy and safety of each of the chemical peeling agents used.
- ✎ Stop using any make up, moisturizer, conditioner or spray 24 hours preoperatively as oils on the skin prevent transepidermal penetration.

### Reagents of chemical peeling:-

- 1- Trichloroacetic acid (TCA 35%): Was prepared in Biochemistry department of Tanta Faculty of Medicine [35 grams of trichloroacetic acid crystals were dissolved in distilled water to form 100cc of 35% solution (wt/vol method) and other concentrations were prepared by dilution method from the original solution], this can be stored safely in a glass bottle for six months (Ροενιγκ ανδ Βροδλανδ, 1993; Βριδενεστεν ανδ Δολεζαλ, 1994 & ζοσσεν ετ αλ., 2000).
- 2- Glycolic acid (70%):- Was prepared in Biochemistry department of Tanta Faculty of Medicine [70 grams of glycolic acid crystals were dissolved in distilled water to form 100cc of 70% solution (wt/vol method) with pH 1.6, then it was buffered by adding 0.5 mole of sodium hydroxide (NaOH) to each mole of 70% glycolic acid to obtain buffered GA solution with pH 3.8 and other concentrations were prepared by dilution method from the original solution. The decreased glycolic acid concentration didn't consequently decrease pH of the original solution (Φυλτον,1994, ζαν Σχοττ ετ αλ., 1996 & ζοσσεν ετ αλ., 2000).
- 3- Amino acid filaggrin based antioxidants (AFA Clay- Peel):- AFAs are manufactured by Dr. Klein company exCel Cosme-ceuticals in

Bloom field Hills, imported by Mcnein Establishment, Saudi Arabia.

*It is formed of the following kits:-*

- 1-AFA 40 Antioxidant gel.
- 2-AFA 50 Antioxidant gel.
- 3- AFA 60 Antioxidant gel.
- 4-AFA Cleanser.
- 5-AFA Toner Mist.
- 6-AFA Clay Peel.
- 7-AFA step 2 gel .
- 8-Plastic blades for application of clay mask.
- 9-Thin cotton pads for application of the AFA gel (Κλειν, 2000)

#### Preparation for peel procedure

According to ζαν Σχοττ ετ αλ., 1996:

- Makeup and any contact lenses must be removed.
- Scalp was protected with a plastic cap or shower bonnet.
- A paper drape was applied around the neck and placed up over the ears.
- Lateral and medial canthi, nasolabial creases and nasal alae, lateral comissures of the lips and the lips themselves could be protected with petrolatum.
- Eyes were protected by antibiotic ointment, gauze pads, and hypo allergic tape or goggles.

#### Equipments and method:

TCA(15%-35%(Φυλτων,1994; Ρυβιν, 1995; Οβαγι, 1996 & Δεχηαρδ ανδ Χαληουν, 2000):

**Preparation:**-The skin was degreased by scrubbing with cotton gauze soaked in solution formed of one part acetone to three parts alcohol to promote more uniform penetration of peeling agent.

**Equipments:**-Dark, glass bottles containing appropriate concentrations of TCA(15%,25%,35%), cotton tipped applicators, square cotton gauze, small glass cup to hold small quantities of TCA, dry ice bags and a readily accessible container of sterile water.

**Procedure:-**

- Cotton –tipped applicator was moistened with TCA and rolled against the wall of glass cup to remove excess fluid. Then, applied to an area of skin not more than 2 by 3 cm by firmly rubbing the moistened applicator in circular fashion. It was distributed as the following forehead was treated at first then cheeks followed by the nose then upper lip and chin.
- Even application was tried, however areas of poor frosting were retreated. Frosting usually was achieved within 30 seconds to 2 minutes.
- Feathering techniques were used at the jaw line extending onto the neck and behind the ear to prevent sharp demarcation lines. TCA application was also extended to the hairline.
- The cotton tipped applicator was disposable and used only once and discarded. A new cotton tipped applicator and gauze was used at each site.

- TCA was used in gradually increased concentration from session to session (15%, 25%, and 35%) according to patient tolerability and improvement.
- Peeled area was rinsed with cold water after appearance of frost or either earlier than that if there is intolerable burning sensation or erythema.
- The entire procedure took approximately twenty minutes per patient.

**Immediate post operative care:** - At the end of each session face was washed with tap water and a thin layer of sun screen was applied gently.

*2-Glycolic acid (20%-*

*70%)(Φυλτων, 1994, Διτρε ετ αλ., 1996, Οβαγι,1996*

*& Χαλλενδε, 2004).*

**Preparation:**-The skin was degreased as mentioned above.

**Equipments:**-Bottles containing appropriate concentrations of GA(20%,35%,50%and70%), cotton tipped applicators, square cotton gauze, small glass cup to hold small quantities of GA, and a readily accessible container of sterile water.

**Procedure:-**

- The agent was applied rapidly covering the entire face within about 20 seconds with a large cotton applicator. It was distributed as the following, forehead was treated at first then cheeks followed by the nose then upper lip and chin with feathering the acid.
- GA penetration is time dependant ,so it was washed after(3:5minutes) or earlier than that if sever erythema occurs ,first the GA was wiped off with copious water soaked gauze then patient splashed water on

his face to ensure complete removal of the acid and to avoid more penetration which results in deep burns.

- A gradually increased concentration of glycolic acid was used from session to session. At first 20% concentration was used as diagnostic baseline peel for doctor and the patient and according to patient tolerability and improvement, concentration was increased to 35,50and70%.
- The entire procedure took approximately twenty minutes per patient.

**Immediate post operative care:** - At the end of each session face was washed with tap water and a thin layer of sun screen was applied gently.

### 3- Amino acid filaggrin based antioxidants (AFAs) (Κλειν, 2000):

- First, third and fifth sessions are the same (AFA Clay Mask and step two gel):-
  - The face was cleansed with AFA cleanser to be sure that all make-up was removed, with avoidance of rubbing or abrading the skin.
  - AFA Clay was applied evenly to the skin in a thin layer, using the applicator provided. Contact with eyes was avoided. Clay mask was left on face for 5:6 minutes.
  - The clay was gently removed with wet sponge, soft cloth or gauze.
  - Soft towel was used to pat the skin dry, without rubbing. The skin was allowed to air dry for few minutes before proceeding to step two.

- A thin even layer of the AFA step-2 gel peel was applied to the skin; starting at the periphery of the face. It was applied to the sensitive area of the eyes last. The peel was applied with the pads with the kit or with gloved finger tips, with avoidance of rubbing into the skin. The peel was washed with cool water after 1:2 minutes or earlier than that if any erythema or discomfort exists.
- The entire procedure took approximately 25 minutes per patient.

**Immediate post operative care:** Once the gel was removed the AFA Toner was misted to further comfort the skin and sunblock was applied gently.

➤ Second session AFA 40 Antioxidant gel :-

- The face was cleansed with AFA cleanser to be sure that all make-up was removed, with avoidance of rubbing or abrading the skin.
- Soft towel was used to pat the skin dry, without rubbing. The skin was allowed to air dry for several minutes.
- A thin even layer of the AFA 40 Antioxidant gel was applied to the skin; starting at the periphery of the face. It was applied to the sensitive area of the eyes last. The peel was applied with the pads with the kit or with gloved finger tips, with avoidance of rubbing into the skin. The peel was washed with cool water after 1:2 minutes or less than that if any erythema or discomfort exists.
- The entire procedure took approximately twenty minutes per patient.

**Immediate post operative care:** Once removed the AFA Toner was misted to further comfort the skin and sunblock was applied gently.

- Fourth session: - The same steps as the second session but with application of AFA 50 Antioxidant gel.

- Sixth session: - The same steps as the second session but with application of AFA 60 Antioxidant gel.

#### Post peel instructions (ζαν Σχοττ ετ αλ., 1996)

The patient was instructed to:

- ✗ Avoid aggressive chewing and smiling in order to avoid scarring, cobblestoning, roughness and cracking.
- ✗ Wash the treated area very gently twice daily with non irritating soap.
- ✗ Avoid use of abrasive or exfoliating sponges on the treated areas.
- ✗ Avoid extensive sun exposure.
- ✗ Continue to apply sun screen at least 6 months after the procedure.
- ✗ Avoid picking, scrubbing, peeling or scratching the skin.
- ✗ Avoid the use of any topical medication except the sunscreens or moisturisers.
- ✗ Male patients were allowed to shave after 3 days from the session.

**7-Results Evaluation:** - The results were evaluated subjectively by at least two clinical investigators and objectively with photographs taken at baseline during the six sessions, and follow up (Σαρκαρ ετ αλ., 2002 & Σηαη ετ αλ., 2005).

***I-Clinical evaluation:*** In which efficacy of treatment and beginning of improvement were encountered as the following:-

- 1- Doctors opinion: The mean value of two different physicians (always me and my supervisor) opinions in percent was calculated and registered before asking the patient.
- 2- Patients opinion.
- 3- The mean value of the two opinions was calculated as the efficacy of this particular treatment.

Improvement from baseline was rated on a four-point scale by both patient and physician at each visit where excellent  $\geq 75\%$ (if more than 75% of lesions were revealed) , good  $\geq 50\%$ (if more than 50% of lesions were revealed), fair  $< 50\%$ (if less than 50% of lesions were revealed) and worsening (if there is exacerbation or deterioration of the original disease) (Τυλεψα, 2003).

**II- Safety evaluation:** Safety was evaluated by the assessment of the appearance of any side effects as:-Erythema, discomfort (burning, itching), infection, scaling, dryness, postinflammatory hyperpigmentation each visit on a four-point scale for severity assessment (- = none, + = mild, ++ = moderate, +++ = severe).

**III-Recurrence evaluation:** Recurrence was evaluated during the period of follow up for an average of 4 months after the 6 sessions of treatment.

## Methodology



**Photo 1: Amino acid filaggrin based antioxidant (AFAs) kit.**



**Photo 2: Applied AFAs clay mask.**



**Photo 3: Removal of AFAs clay mask by sponge and water.**



**Photo 4: A case of visible exfoliation 2 days after TCA peel.**



**Photo 5: Appearance of white frost 5 minutes after application of 35% TCA.**