

## *Summary and Conclusion*

Freckles are benign pigmented spots, commonly occurring in the Caucasian population especially those with red hair and fair skin. They are located predominantly on sun exposed areas, increase in number and pigmentation during summer months and tend to fade during winter months (**Plensdorf and Martinez, 2009**).

Although they pose no health risk, freckles cause an increasing concern because of the wide spreading cosmetic attention of society and possible association with skin cancer (**Yang et al., 2008**).

There are different treatment modalities which may reduce the occurrence and severity of freckles, but it is still with a relatively high rate of recurrence (**Rashid et al., 2002**).

The aim of our study is to evaluate the efficacy and safety of cryotherapy Vs trichloroacetic acid 18% and mandelic acid 50% in treatment of freckles.

Sixty patients complaining of freckles were included in this study. It was carried out at the Dermatology and Andrology Department of Benha University Hospital.

Patients were classified into three groups :-

**Group I :** Twenty patients treated with cryotherapy once.

**Group II :** Twenty patients treated with trichloroacetic acid 18% once per week for 12 weeks.

**Group III :** Twenty patients treated with mandelic acid 50% once per week for 12 weeks.

The improvement from baseline was rated on a four-point scale by both patient and physician at each visit, according to the intensity of lightening of colour of lesions, and the mean value of the two opinions was calculated as the efficacy of this particular treatment.

The safety was evaluated by the assessment of the appearance of any side effects as : pain, erythema, crusts, PIH and scarring at each visit, and the recurrence was also evaluated during the period of follow up for an average of 4 months after treatment

There was no statistical significant difference between the 3 studied groups as regard the improvement %, although there was better improvement and significant lightening of freckles among patients treated with cryotherapy and mandelic acid.

The relation between marked improvement among the 3 studied groups according to skin phototype was statistically significant in skin type I where the TCA was superior, and in skin type II where mandelic acid was superior.

Cryotherapy using the spray technique gives better results than direct application of liquid nitrogen, with less side effects. Also TCA using lower concentrations gives better results with less side effects than higher concentrations.

Mandelic acid is an AHA with a large molecule that penetrates the epidermis more slowly and uniformly, so it is an ideal peeling agent for patients with sensitive skin, producing slower and safer peeling action, less side effects as erythema, crusting and PIH and quicker healing after the session.

There was a highly statistical significant relation between the improvement % and skin phototype among all cases, where there was better improvement among patients with fair skin.

The higher the age of patients and the higher the age of onset of freckles, the better the improvement.

Patients treated with mandelic acid were the quickest to be healed, followed by cryotherapy and lastly TCA. This difference was statistically significant.

Mandelic acid is safer than TCA and cryotherapy in dark skin types, where 0% of patients treated with mandelic acid reported PIH, while 10% of patients in each of cryotherapy group and TCA group reported PIH, who were all of skin type IV.

There was a high recurrence rate among all cases (50%), but there was no statistical significant difference between the 3 studied groups as regard the recurrence rate. This high rate of recurrence is due to the pathogenesis of freckles itself, and not due to the treatment modality as freckles is genetically determined and with exposure to sunlight freckles reappear again.

The recurrence rate was higher in fair skin types. This relation was statistically significant only in cryotherapy group.

In conclusion, mandelic acid is a well tolerated peeling agent that is safer than TCA and cryotherapy in dark skin types, producing less side effects and quicker healing, but it gives a slow gradual improvement that needs a period of months. It will be better to select patients with lower skin types in treatment of freckles with cryotherapy or TCA, as the efficacy is more and PIH, as an adverse effect, is at least in this situation.