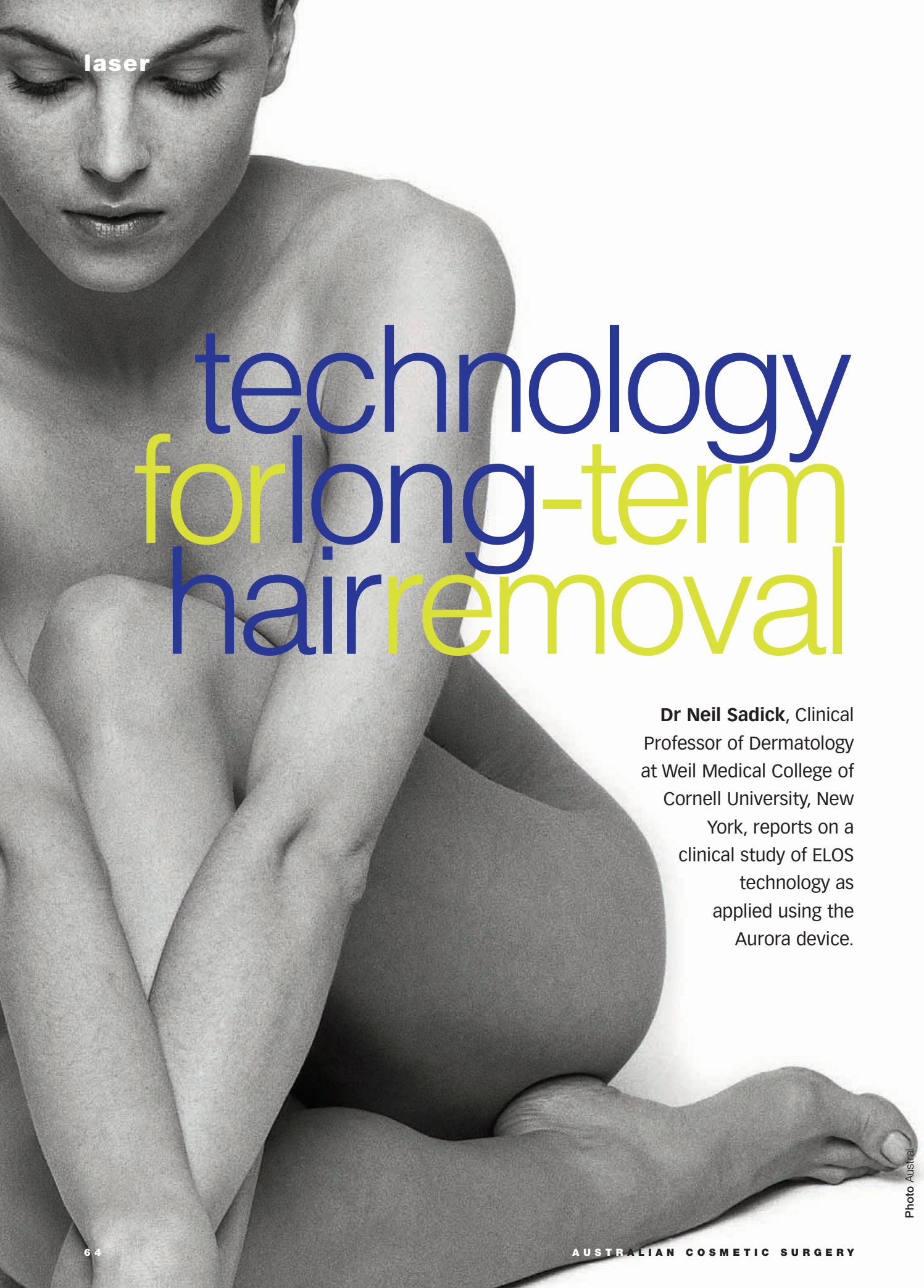

technology for long-term hair removal

Dr Neil Sadick, Clinical Professor of Dermatology at Weil Medical College of Cornell University, New York, reports on a clinical study of ELOS technology as applied using the Aurora device.

Photo Austral

Introduction

Electro-Optical Synergy (ELOS), a combination of optical and conducted RF energy, is a new approach in aesthetic medicine. The theory behind ELOS technology is to use less light than is traditionally required for hair removal by light-based technologies and to compensate for the reduced heating by using a different energy form – conducted RF energy that is not sensitive to skin or hair colour.

The ELOS concept was developed by Syneron Medical Ltd and is utilised in the Aurora device. Using ELOS for hair removal introduces new treatment options, especially where light-based systems failed to show results, such as on light-coloured hair, including white and blond hair. In addition, due to the greater penetration depth of the RF current, results are superior in the case of deep hairs on the male back compared to those achieved by light-based or laser-based devices.

'By using two different types of energies, one can reduce the optical energy to a safe level that can be used even on darker skin types...'

Both the light and RF energies are pulsed and delivered to the tissue with a hand-held applicator. By using two different types of energies, one can reduce the optical energy to a safe level that can be used even on darker skin types (V, VI). The conducted RF selectivity mechanism is not based on melanin absorption and therefore is not sensitive to skin colour or hair colour. Nevertheless, the theory behind the Aurora device is based on the principle of selective thermolysis. According to this principle, parameters of optical and RF energies (spectrum, exposure duration and energy density) are chosen and optimised to selectively damage (destroy) the hair follicle without damaging the surrounding tissues.

Study protocol & results

In this clinical study, 56 male and female patients with Fitzpatrick's skin type 2 to 5 and various hair colours and body sites were selected. Informed consent of all participants was obtained and the body sites to be treated were identified and photographed. A baseline hair count was obtained manually. The target areas were shaved prior to treatment. No topical anaesthetic cream or other anaesthetic was applied.

All patients received four treatment sessions over a period of nine to 12 months and results were monitored six months after the last treatment. Transparent gel or water was used for skin hydration. Light pressure was applied via the applicator to the treatment sites in order to ensure good coupling of electrodes to the skin surface. Treatment overlap of up to 20 per cent was acceptable.

The light energy range used varied from 15-30 J/cm2, set according to the patient's skin colour. Since RF energy is equally efficient for all hair colours, and is not sensitive to skin colour, other guidelines were used to determine the appropriate application of RF energy. On body areas with dense and thick hair, lower RF energy was used – typically 10-14 J/cm3. In all other cases, higher RF energy of 18-25 J/cm3 was used. Skin temperature was maintained at around 5˚C by the effective epidermal contact cooling provided by the system. In contrast to other purely optical devices, the Aurora system uses a low level of optical energy, which causes the hair shafts to be heated to a lower temperature compared with pure light-based systems. Hence, hair shaft evaporation was not commonly observed.

RF energy affects the hair follicles directly, causing them to coagulate. Effective cooling protects the epidermis from the immediate erythema. Typically, peri-follicular bleaching was observed after the pulse as a normal treatment endpoint, appearing only after 10 to 15 minutes. While transient erythema was observed in some patients, it disappeared within a few hours. As the cooling has the effect of delaying all side effects, the patients were asked to observe the treated site and to report any side effects noticed in the immediate hours or days following the treatment. During the first week after the treatment, no significant hair reduction was observed, which was expected due to the time it takes for the hair to fall out of the follicle. Maximum reduction in hair count was observed at four to eight weeks after each treatment for the first group of patients.

'Maximum reduction in hair count was observed at four to eight weeks after each treatment...'

Typically, hair density as noted by patients and the investigators decreased from treatment to treatment. Final clearance results in the various body locations were: axilla 80 per cent; bikini line 75 per cent; back 70 per cent; face 65 per cent. Clearance of 72 per cent was observed on average at all body sites at six months post-treatment. No adverse effects were noted at the follow-up visits.

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Minor erythema, observed in 20 per cent of patients, resolved within one day to one week post-treatment. The results show no significant dependence on skin colour, as darker and lighter skin types responded similarly to the treatment.

Conclusion

Hair removal methodologies based purely on photo-epilation systems (whether laser-based or using intense filtered flash lamps) have shown excellent results on the optimal hair removal candidate with light skin and dark hairs. On the other combinations of skin types and hair colours, results and adverse effects are more challenging.

'...the learning curve for setting treatment parameters is usually short'

The Aurora simultaneously delivers two types of energies, optical and electrical (conducted RF), to the tissue. The unique combination of energies allows the treatment of all skin types and hair colours without compromising safety or efficacy.

Since there are clear guidelines for setting the optical and RF energy levels, the learning curve for setting treatment parameters is usually short. When treating darker skin types, optical energy is lower for safety reasons, but treatment efficacy is not affected as the RF energy is higher. On the lighter hairs, the use of higher optical and RF energies exhibits, for the first time, excellent results on this patient group, which had achieved minor response from traditional light-based systems.

The treatments were well tolerated by the subjects, none of whom required topical or other anaesthesia. The only post-treatment side effect observed was transient erythema, which disappeared within a day. Long-term results for all treatment sites and patients showed excellent hair clearance. These results were achieved with a relatively lower level of optical energy than is required with single-energy methodologies and hence demonstrate the important role of RF energy in hair removal.

The treatment efficacy, absence of adverse side effects and patient comfort exhibited in the study prove that the combination of conducted RF energy and optical energy, as delivered by the Aurora hair removal system, is an excellent methodology for hair removal in a broad cross section of the patient population. **acsm**

Figure 1 BEFORE

Figure 1 AFTER shows photos of a male's chest before and after two treatment sessions. Photos courtesy of Dr J Shaoul

Figure 2 BEFORE

Figure 2 AFTER shows before and after photo of chin with 85 per cent hair loss of white hairs after five treatment sessions