

The First Topical Immunomodulator for Atopic Dermatitis

reported by Drs. L. S. Ku and W. K. Tang

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Organizer:	HKSDV, Dept. of Medicine, HKU, The Hong Kong Paediatric Society

marrow transplantation; and patients with atopic dermatitis develop asthma or allergic rhinitis in later life, disorder of the lymphoproliferative system and compartmentalization of immune response have been suggested.

Pathogenesis and Epidemiology of Atopic Dermatitis

Speaker: Dr. H. H. L. Chan

Atopic dermatitis is a chronic inflammatory skin disease that commonly affects children but without a magic cure so far. The prevalence of this problem varies widely, from 0.3% to 20.5%, in different countries.

The exact pathogenesis of atopic dermatitis is unknown. But epidemiological, clinical and immunological studies give clues to the pathogenesis of the disease. Genetic, immunological, cultural behaviour and environmental factors are considered to be important in this disease. Recent studies revealed that there is a biphasic cytokine expression pattern-IL-4 and IL-13 (TH2's cytokines) for the acute lesions, and IL-5 and IFN-Alpha (TH1's cytokines) for the chronic lesions in atopic dermatitis.

IgE is also found contributory to the pathogenesis of atopic dermatitis. It is released from mast cells and causes immediate swelling and pruritus of the lesion. Infiltration of eosinophils, monocytes, cutaneous antigen presenting cells such as Langerhans' cell and macrophages, which bear IgE receptors on their surfaces, will then follow. This will facilitate allergen presentation to TH2 cells. Environmental factors, exogenous allergens and bacterial infection may cause and/or aggravate atopic dermatitis. Interestingly, IgE antibodies against human cytoplasmic protein from keratinocytes have also been found.

From the observation that atopic dermatitis develops in Wiskott-Aldrich syndrome and after bone

Learning points:

Atopic dermatitis is a chronic inflammatory skin disease and there is no cure for it so far. Pro-inflammatory cytokines and IgE play an important role in the pathogenesis of the disease.

Basic Science and Overview of Tacrolimus

Speaker: Dr. A. Wollenberg

Tacrolimus is a new drug in the class of macrolide. It is used as an immunomodulator for the treatment of atopic dermatitis.

Mechanism of action

Atopic dermatitis is a complex inflammatory disease. It involves T-cells, Langerhans' cells, mast cells and inflammatory mediators. Tacrolimus acts by first binding to calcineurin to form a complex. This complex eventually inhibits the transcription of pro-inflammatory cytokines and T-cell proliferation. Tacrolimus was also found to be able to down-regulate the high affinity IgE receptor on epidermal dendritic cells, and inhibit the release of histamine and other inflammatory mediators from mast cells and basophils.

Clinical advantages with tacrolimus

Owing to the large molecular weight (around 822KD), tacrolimus can only penetrate into inflamed skin. Studies have shown that there was little or no absorption into the systemic circulation after repeated applications to intact skin. The systemic absorption of

this drug through lesional skin is also minimal and that declines rapidly as the lesions start to heal.

Another major benefit of this new drug is that it does not affect collagen synthesis and thus does not cause skin atrophy. The concentration of collagen precursors had been shown to remain unchanged in tacrolimus treated areas and there was no decrease in the skin thickness when compared with topical steroids.

Although tacrolimus by itself is not bactericidal, the density of colonization of *Staphylococcal aureus* was also found to be reduced as the skin condition improved.

High efficacy rates of tacrolimus in the treatment of atopic dermatitis have been shown in multicentre trials. Patients usually have significant improvement within the first few days of treatment. And in paediatric patients, 0.03% tacrolimus had been shown to be as effective as that at 0.1%.

Clinical disadvantages with tacrolimus

Local irritation, such as burning sensation, is the most common adverse effect with tacrolimus. But it usually subsides within a few days when the skin heals. Folliculitis might occasionally occur with the ointment preparation.

Tacrolimus cannot be considered as a "cure" for atopic dermatitis. It is most efficacious in treating mild to moderate but not severe disease. Continuous treatment is needed to maintain clinical improvement.

Learning points:

Tacrolimus is an immunomodulator belonging to the macrolide group. It has shown promising results in the treatment of atopic dermatitis at no expense of skin atrophy and systemic side effects.

Clinical Experience of Tacrolimus Ointment in Japan

Speaker: Dr. M. Ohtsuki

Tacrolimus is a macrolide derived from *Streptomyces* isolated from a soil sample taken from Mountain Tsukuba in Japan. In 1999, Japan was the first country in the world to launch tacrolimus ointment as a novel treatment agent for atopic dermatitis. Being a topical immunomodulator, tacrolimus ointment is the first in a new class of atopic dermatitis treatment. After extensive experience from over two years of clinical use, its safety was gradually assured and led to the adoption of its long-term use in Japan.

Tacrolimus ointment was developed in Japan, Europe and the US, with more than 12,000 patients enrolled into various studies. A two-year open-label non-comparative Japanese phase III trials for 0.1% tacrolimus ointment in adult atopic dermatitis was discussed. Its strength was equal or superior to betamethasone valerate as an anti-inflammatory agent. It had rapid onset of action on eczema over the face and neck as well as acute and sub-acute lesions over the trunk. Eczema with severe lichenification or prurigo took longer time to resolve. Although all these symptoms could be improved by long-term tacrolimus application (monotherapy), quicker response was expected by the preceding use of topical steroid (sequential therapy). It was also recommended that for very severe eczema, initial use of potent steroid could alleviate the condition quickly and then followed by tacrolimus therapy. Skin atrophy due to topical steroid was improved with long term use of tacrolimus, probably due to its steroid sparing effect. The reduction in irritation and burning was obvious with time. The blood concentration of tacrolimus in long term follow up was transient and trivial. The incidence of folliculitis was 6.3%, impetigo was 0.3%, superficial fungal infection was 0.5% and herpes simplex was 1.5%. It was found that the incidence of skin infections markedly decreased in the second year of treatment.

In another controlled double-blinded Japanese phase III paediatric trial, vehicles, 0.03% and 0.1% tacrolimus ointment were compared. Tacrolimus ointment 0.1% and 0.03% were found to be more effective than vehicles and the difference in efficacy between 0.1% and 0.03% tacrolimus ointment in paediatric patients was less marked than in adult studies. Tacrolimus ointment provides a beneficial treatment option to physicians and patients and is one of the most important products for long-term atopic dermatitis control. As tacrolimus is still a new agent, there is a need for further investigation in its therapeutic role.

Learning points:

Tacrolimus ointment provides a beneficial treatment option to physicians and patients and is one of the important products for long-term atopic dermatitis control.

Clinical Experience of Tacrolimus Ointment in Europe

Speaker: Dr. J. Berth-Jones

Tacrolimus ointment has been approved for the treatment of severe atopic dermatitis in the US, Japan, the European Union, Canada and Switzerland. Clinical studies involving more than 10,000 patients performed during its global development have shown that tacrolimus monotherapy was effective for short-term and intermittent long-term treatment of atopic dermatitis on affected body surface areas of up to 100%.

A European long-term trial of tacrolimus monotherapy, with topical steroid completely withheld for a prolonged period of time, showed that patients on 0.1% tacrolimus demonstrated continuous and progressive benefit. The long-term safety profile of tacrolimus ointment observed in this study was similar to that of short-term trials. Another European/Canadian trial on paediatric patients 2-15 years of age with moderate to severe atopic dermatitis compared 0.1%,

0.03% tacrolimus with 1% hydrocortisone acetate ointment. The results showed that both 0.1% and 0.03% tacrolimus were significantly more effective than 1% hydrocortisone acetate ointment. Thirty-nine percent of children treated with tacrolimus ointment 0.03% showed excellent improvement (=90%) in disease status or clearance compared with 16% of patients in the hydrocortisone group (p=0.001). Improvement was seen as early as three days after commencement of treatment. By week one, tacrolimus 0.03% therapy led to 46% reduction in pruritus scores, compared with a 33% reduction with hydrocortisone acetate. The differences were more pronounced at the end of treatment, namely 58% and 31% respectively. It was also found out that greater improvement was achieved with tacrolimus 0.1% than with 0.03% concentration.

The speaker remarked that the potency of tacrolimus was comparable to class III topical steroid and there was no dose restriction for tacrolimus ointment. Adult patients can be treated with 0.1% tacrolimus twice a day during the acute phase and switch to 0.03% tacrolimus twice a day for maintenance. Paediatric patients should only be treated with 0.03% tacrolimus throughout. The followings are some good indications for tacrolimus: the presence of steroid dependence, steroid phobia, steroid allergy, steroid side effects and tachyphylaxis. Sensitive skin regions like the face are good indications as well.

In conclusion, tacrolimus ointment is safe and effective for long-term treatment of moderate to severe atopic dermatitis. Long-term studies have shown that about 75% of adult and pediatric patients benefit from monotherapy with tacrolimus ointment. Long-term follow up has shown no changes in the safety profile.

Learning points:

The lack of atrophogenic potential of tacrolimus is a major advantage that may indicate the potential use of this new agent as first line therapy.

Annual Scientific Meeting 2002

reported by Drs. K.K. Ho, L.S. Ku, and W.K. Tang

Date:	14 July, 2002
Venue:	Sheraton Hotel, Hong Kong
Organizer:	HKSDV

New Fellows' Forum

Pityriasis Rubra Pilaris: A Study of 21 Cases in Hong Kong

Speaker: Dr. A. Y. P. Fung

Pityriasis rubra pilaris (PRP) is an uncommon erythematous papulosquamous disorder characterized by erythroderma, palmoplantar keratoderma and follicular hyperkeratosis. Often exhibited at clinical meetings because of its rarity and difficulty in management, its aetiology remains unknown. Griffiths categorized patients with PRP into five clinical types based on age of onset, clinical features, course and prognosis. A sixth type has also been suggested which occurred in patients with human immunodeficiency virus (HIV) infection. While it is uncertain if this addition is justified, Griffiths' classification has not been universally accepted. Other classifications have been proposed in the literature and local data regarding this issue is scanty.

To date, the majority of reports concerning PRP have dealt with white Caucasian patients. Despite some data on Asian and African subjects, affected Hong Kong Chinese have never been studied. In addition, previous studies on PRP were often limited by the lack of specific clinico-pathologic criteria for diagnosis. With the above issues and background in mind, the first PRP study at the Hong Kong Social Hygiene Service was performed.

Twenty-one Chinese patients seen at the Hong Kong Social Hygiene Service, from 1986 to 1999, with

a clinical and histological diagnosis consistent with PRP were studied. Unlike previous studies, a specific list of inclusion criteria for diagnosis of PRP had been drawn up for patient selection. There were no sex difference in adult onset PRP but a female preponderance was noted in the juvenile group. No precipitating factors were identified and familial PRP was not encountered. Thirteen patients had classical adult PRP (Type I), two had the atypical adult form (Type II) and four had the circumscribed juvenile form (Type IV). Two patients could not be categorized according to Griffiths' classification and could represent a variant or another disorder. Erythroderma, follicular hyperkeratosis and palmoplantar keratoderma were helpful diagnostic features, but the presence of follicular papules at dorsal proximal phalanges was an unreliable sign. Acute onset of eruption was a favourable prognostic factor and PRP Type I had the best outcome, with 69% remitting after a mean duration of 23 months. Acitretin (or etretinate before 1997) was the most frequently used systemic therapy. Eight out of eleven patients with PRP Type I treated for a mean duration of 13 months resulted in complete clearing.

Local data was compared with those from other published series. In contrast to recent studies, this series found focal acantholytic dyskeratosis to be an incidental rather than a discriminating histological feature of PRP. The lack of standardized diagnostic criteria for PRP and inconsistency in patient selection had made comparison of study results between different groups impossible and occasionally meaningless. In order to facilitate discussion and progress in the study of PRP, a standardized, universally accepted clinico-pathological diagnostic criteria should be drawn up and based upon in all future studies. This would provide a uniform standard by which patients and treatments can be evaluated. A list of inclusion criteria for patient selection was proposed. A better categorization scheme would include a systemic way to describe the probability of

having PRP, such as definite, probable and possible. A list of universally accepted diagnostic criteria for PRP would require the work of an international study group.

Learning points:

Pityriasis rubra pilaris (PRP) is an uncommon erythematous papulosquamous disorder of unknown cause. The disease is characterized by erythroderma, palmoplantar keratoderma and follicular hyperkeratosis. Unfortunately, there are no standardized diagnostic criteria for this disease.

New Fellows' Forum

A Cross-Sectional Survey on the Cutaneous Disorders among Asian Patients Infected with Human Immunodeficiency Virus in Hong Kong

Speaker: Dr. T. Y. Ho

Human immunodeficiency virus (HIV) infected individuals are more susceptible to skin problems. In this presentation the speaker shared her experience in the skin problems found in HIV-1 infected patients.

A cross-sectional study was conducted in a local health centre for HIV infected patients in 2000. The point prevalence and cumulative incidence of cutaneous disorders were determined. The screening process consisted of record review, patient interview and a full skin examination.

One hundred and eighty-six HIV-positive patients were recruited. The average duration of known HIV infection was 43.0 months. Sixty-eight percent were on HAART for an average duration of 19.6 months.

Ninety-four percent (175 of 186) subjects suffered one or more cutaneous disorder after HIV infection had been diagnosed. The most common skin disorders in descending order were: tinea pedis, eczema,

onychomycosis, seborrhoeic dermatitis and drug reaction. For point prevalence, 86% (160 of 186) patients had one or more cutaneous disorder. Tinea pedis was again the most common, followed by onychomycosis, eczema, seborrhoeic dermatitis and lipodystrophy.

It was found that the male sex was independently associated with more skin problems, both for cumulative incidence and point prevalence. Patients on HAART were found to have more, but statistically insignificant, skin problems during their course of HIV infection. A low CD4 count was also associated with more skin problems. The skin conditions that could be related to HAART included lipodystrophy, nail changes (acute paronychia, ingrown toe nail and nails dystrophy), cheilitis, pigmentary changes and xerosis. Nineteen percent (21 of 109) patients developed lipodystrophy after treated with protease inhibitors for three months or longer. The finding concurred with other studies.

Distal and lateral onychomycosis was the most common onychomycosis. As in the local general population, *Trichophyton rubrum* was the most frequently isolated fungus.

Forty-one (22%) cases had been found to have one or more allergic skin condition. The most frequently incriminated drug was cotrimoxazole. For antiretrovirals, nevirapine was the most common cause of drug allergy.

Herpes zoster was common in HIV infected patients and thirty one percent of these patients had a positive history. Primary care doctors should consider underlying HIV infection in sexually active patients with herpes zoster, especially if there is recurrent attack.

Learning points:

Skin disorders are common in HIV infected patients. HIV infection should be looked for in sexually active patients with herpes zoster, especially those with recurrent episodes.

New Fellows' Forum

A Study on the Role of Food in Early and Delayed Aggravation of Atopic Dermatitis in Chinese Children

Speaker: Dr. F. W. K. Yu

Atopic dermatitis (AD) is one of the commonest paediatric skin diseases. In AD, there is an increase in TH-2 but a decrease in TH-1 response. These lead to an aggravated immediate type but a decreased delayed type of hypersensitivity reaction. In a survey of AD patients in a government clinic in Hong Kong, 44.1% of patients gave a history that food might aggravate their AD. Seafood, egg, beef, milk and fried food were the most common items quoted.

The speaker conducted a pilot study on the role of food as an aggravating factor in Chinese AD children. The pattern of food prick test, food patch test, their sensitivity and specificity as well as the validity of the double-blind placebo-controlled food challenge (DBPCFC) in the identification of culprit foods were studied. Chinese patients aged between four and 25 years with AD were recruited from the Paediatric Dermatology Clinic of Prince of Wales Hospital, Hong Kong. All patients with AD attending the clinic during the study period were given a questionnaire to inquire about any history of possible food induced exacerbation of eczema. Those with suspected food allergy were then recruited for skin prick test, DBPCFC and dimethylsulfoxide food test (DIMSOFT test). The latter was a form of food patch test developed by Breneman using a suspension of food products in dimethylsulfoxide. Lobster and shrimp were chosen to be the challenge for all the patients because they had the highest frequency of positive skin prick tests. DBPCFC was conducted in three days and the clinical severity was scored on a SCORAD chart. At the end of the study period, if no immediate reaction was detected, an open food challenge, in form of a meal, was given. The patients were assessed again three days later using the SCORAD chart.

Skin prick tests against crab, lobster, shrimp, codfish, peanut and tuna were found to have the highest positive rates (26.8%, 24.4%, 22.0%, 14.6% and 14.6%, respectively). The pattern of prick test positivity was very similar to those of Guangzhou, Taiwan and other Asian countries, with crustacean seafood being the commonest positive items. A significant correlation was

shown between prick test positivity for lobster and concomitant asthma and atopic diseases ($p=0.024$ and 0.0106 respectively).

In DBPCFC, three patients out of 22 tested showed aggravation after taking lobsters capsules and one after taking shrimp capsules. The casual relationship of aggravation to food in these patients might need to be confirmed by repeated re-challenge with DBPCFC, as the severity and extend of AD tended to fluctuate naturally by itself. It was also found that history of hypersensitivity was not useful in predicting which patient would react to food challenge. In the study, none of the patients with positive prick test to lobster or shrimp showed any immediate reactions on DBPCFC. This could be explained by changes in the permeability of the intestine and neutralization by IgA in the intestinal mucosa and serum. No false negative prick results for immediate reactions were noted. RAST test was not performed in this study because when tested with DBPCFC, skin prick test and RAST resulted had very similar sensitivities and specificities.

In conclusion, this pilot study confirmed that in Hong Kong crustacean seafood were the foods that were most commonly considered by patients as an aggravation factor for their AD and had the highest incidence of positive prick test. In DBPCFC, no immediate or delayed symptoms occurred in both lobsters and shrimps. The predictive value of prick tests for immediate allergy was thus zero for these two kinds of foods. Aggravation after DBPCFC with lobster or shrimp occurred only in a small proportion of children with AD. Patients' history, prick test, patch test and immediate reaction to DBPCFC did not have very reliable predictive value for such aggravation. Further large-scale study with repeated challenge for positive patients may be needed in the future.

Learning points:

In Hong Kong crustacean seafood were the foods that were most commonly considered by patients as an aggravation factor for their AD and had the highest incidence of positive prick test. However, patients' history, prick test, patch test and immediate reaction to DBPCFC did not have very reliable predictive value for such aggravation.

New Fellows' Forum

Acquired Bilateral Nevus of Ota-like Macules: A Review

Speaker: Dr. A. Y. M. Lam

The speaker began with the definition of acquired bilateral nevus of Ota-like macules (ABNOM), as this pigmentary disorder is known by different names in various literatures such as nevus fusco-caeruleus zygomaticus, Hori's nevus, acquired circumscribed dermal facial melanocytosis. The clinical significance of ABNOM in Asians is listed in Table 1.

Table 1. Clinical significance of ABNOM in Asian

- | | |
|----|---|
| 1. | It is a common disorder |
| 2. | It may be unrecognised or misdiagnosed |
| 3. | Western doctors are unfamiliar with this disorder |
| 4. | It causes much cosmetic concern |
| 5. | It is amenable to treatment |

Definition

ABNOM is an acquired late onset pigmentary disorder occurring bilaterally and symmetrically over the face. It is characterized by speckled and confluent brownish blue or slate-gray pigmentation. The commonest sites of involvement are malar regions, temples, root of nose, alae nasi, eyelids and the forehead. Typically, the mucosa is not involved.

Epidemiology

In a large-scale study, the overall incidence was 0.8%. There was marked female preponderance with male to female ratio of 1:6. In one study, the incidence in female alone was 1.2% to 2.4%. ABNOM has only been described in Orientals like Japan, Taiwan, Thailand, Singapore and Hong Kong. There has been controversy regarding the age of onset. According to speaker's experience, the usual age of onset was twenties and patients sought medical advice in their thirties.

Clinical features

The lesions consist of asymptomatic symmetrical, bilateral speckled macules over the malar region of both cheeks with a mixed hue of brown, slate-gray or blue-black colour. Various sites may be affected, the

involvement frequency of zygomatic regions, alae nasi, root of nose, temples, upper eyelids were 96.4%, 35.7%, 25%, 17.8% and 3.5% respectively. Unlike nevus of Ota, there is no involvement of the conjunctiva, buccal mucosa or palatal mucosa.

Histopathology

The main changes are in the papillary dermis. Elongated slender melanocytes are dispersed between the collagen fibres of subpapillary dermis. Usually the epidermis appears normal.

Pathogenesis

The pathogenesis of the condition is still unknown. But several theories have been put forward such as dropping off of epidermal melanocyte, migration of hair bulb melanocytes and reactivation of pre-existing latent dermal melanocytes. The triggering factors may be dermal inflammation, ultraviolet radiation or hormonal changes in pregnancy.

Differential diagnosis

The differential diagnoses are freckles, lentigines, melasma, post-inflammatory hyperpigmentation, pigmentary incontinence due to various causes and bilateral nevus of Ota. Typical cases usually pose no diagnostic problems. However it may confuse the clinician if a thirties Oriental patient present a mixed picture of lentigines, freckles, melasma, post-inflammatory hyperpigmentation and ABNOM.

Treatment

Chemical peeling and cryotherapy are not effective for ABNOM. Effective treatments for ABNOM include dermabrasion, Q-S Ruby laser, Q-S Nd:YAG laser and Q-S Alexandrite laser. Multiple sessions are usually required for optimal results. The common complications are post-inflammatory hyperpigmentation and temporary hypopigmentation.

Learning points:

ABNOM is common in oriental patient. It causes much cosmetic concern but is amenable to various laser treatment modalities.

Update on a New Topical Immunomodulator, Pimecrolimus, for Atopic Dermatitis

Speaker: Dr. D. Varigos

Atopic dermatitis (AD) is a highly prevalent condition affecting the quality of life of children and their families. The incidence is around 10-20% among children in developing countries and its trend is increasing. The clinical presentation of AD usually begins within the first five years.

Management of AD

In the management of AD, causes that lead to flare of AD should be sought. In case of acute flare up, concomitant bacterial or viral infection must be looked for and treated. The presence of chronic exposure of allergens and non-compliance are the causes for chronic or persistent flare up in AD.

Topical steroid

The management of AD relied on topical steroids as an anti-inflammatory agent for many decades. However, there are concerns about the side effects of topical steroid in prolonged usage. The cutaneous side effects are skin atrophy, telangiectasia, acneiform eruption and tachyphylaxis, whereas the systemic side effects include Cushing syndrome and osteoporosis. Because of these side effects, parental phobia of topical steroid reduces the compliance and explains the poor control and frequent relapses in certain cases.

Pimecrolimus

By understanding more about T cells and cytokines in the pathogenesis of AD, Pimecrolimus, one of the topical calcineurin inhibitors, is one of the new drugs targeting specifically at the disease process.

Pimecrolimus, a non-steroidal topical anti-inflammatory agent, has low permeation to skin, which specifically reduces T cell inflammation and cytokines. Therefore, it has none of the side effects of topical steroid such as skin atrophy and metabolic actions. Because of the low permeation, it has minimal systemic immunosuppression in clinical model.

Clinical trials have been conducted from infant to adult in well-designed double blind placebo controlled trial. Pimecrolimus demonstrated significant improvement and less flare up of AD in comparison with vehicle. The clinical effects on pruritus, erythema and eczema activity severity score (EASI) were observed to improve from the first week to twenty-four weeks. The clinical side effects of itchiness and burning sensation were not different from vehicle.

Concerning the safety of pimecrolimus, the drug demonstrated no photocarcinogenic, photoallergic or phototoxic effect in photobiology. In addition, there was minimal systemic absorption and cumulative side effect in prolonged usage in patients aged three-month-old or above for up to one year.

In conclusion, pimecrolimus is one of the new topical treatments of AD with similar efficacy to topical steroid with no skin atrophy and minimal systemic immunosuppression. As with all new therapies, the place of pimecrolimus in every day treatment of AD needs further studies.

Learning points:

Pimecrolimus is one of the non-steroidal topical immunomodulatory agents in the treatment of AD which does not carry the side effects of topical steroid.

Clinical Application of Lasers in Asians

Speaker: Dr. H. H. L. Chan

Introduction

Laser surgery for Asians differs from Caucasians in several important aspects. Some conditions such as nevus of Ota and acquired bilateral nevus of Ota-like macules (ABNOM or Hori's macules) are more commonly seen in Asians. Secondly, Asians with photo-damage tend to have more pigmentary problems with less wrinkling than Caucasians. Lastly, Asian skin, with its higher epidermal melanin content, is more likely to develop adverse pigmentary reactions following laser surgery.

Laser resurfacing and non-ablative skin rejuvenation

Asians tend to experience much less wrinkling and therefore resurfacing is more commonly used for acne scars. Post-laser complications such as erythema and pigmentary changes are important issue to Asians. To avoid these complications long wavelength such as erbium-YAG laser is associated with less erythema and a lower risk of hyperpigmentation, and is particularly useful for Asians. Non-ablative rejuvenation has generated much interest. Given the potential adverse effects associated with traditional laser resurfacing in Asian patients, these non-ablative devices may be particular attractive to Asian. The speaker has been using both Intense Pulse Light (IPL) and 1320 nm cooltouch II to treat pitted scar in the central facial zone. The adverse effects of such complications were significantly lessened without any loss of efficacy. It is important to recheck the real time temperature monitoring frequently and lower the temperature when such area is treated. However, the long-term safety of non-ablative skin rejuvenation is still not yet established.

Nevus of Ota

Nevus of Ota is common in Asians. Q-switched lasers have been used effectively in lightening of this condition with minimal adverse effects. Studies comparing the use of QS Alexandrite and QS Nd:YAG lasers found that most patients tolerated QS Alexandrite. However, QS Nd:YAG laser appeared to be more

effective than QS Alex in the lightening of nevus of Ota after three or more laser treatment sessions. In addition, the speakers' group first published the recurrence of the original pigmentation in patient after complete laser-induced clearing. According to speaker's experience, the recurrence rate is ranged from 0.6% to 1.2%.

Laser treatment of nevomelanocytic nevi

The speaker frequently used laser to treat facial melanocytic nevus despite there is lack of long-term safety study. The potential deleterious effect of laser exposure is malignant transformation. The only long-term follow-up study was published in Japan reporting no histological evidence of malignant changes after eight years ruby laser treatment for congenital nevi. The speaker thought that it is the differences in the biological behaviour of melanocytes among patients from different ethnic origins. As most of the melanoma encountered among the Asian population tends to be acral in nature, the speaker would not use laser to treat any acral nevomelanocytic nevi.

Learning points:

Laser surgery for Asian needs special precautions as they have higher epidermal melanin and more likely to develop adverse complications of pigmentary changes.

The Versatility of the 1064 Long Pulse Nd:YAG: Permanent Hair Reduction, Vascular Lesions and Non-ablative Skin Therapy

reported by Dr. K. K. Ho

Date:	16 July, 2002
Venue:	The Empire Hotel
Speaker:	Dr. A. Yi
Organizer:	Dept. of Medicine, HKU, HKSDV & HK Society of Plastic & Reconstructive Surgery

Longer wavelength such as 1064 nm has the advantage of deeper penetration to the targeted chromophore.

Fluence is the most importance factor in laser hair removal as insufficient energy is unable to destroy the hair follicles and may create finer and lighter hair. Finer and lighter hairs are difficult to treat due to the presence of less pigmented chromophore. Therefore adequate energy level must be delivered to the targeted hair follicles.

Laser Hair Removal on Asian Skin

Introduction

Selective photothermolysis by laser in hair removal depends on the amount of light energy absorbed by the hair pigments in hair follicle and is converted into heat. Hence, the heat energy destroys the hair follicles permanently. In partial destruction, finer or lighter hair may occur in case of insufficient heat generation.

Contraindications

The absolute contraindications of laser hair removal are recent tan, white and gray hair, open sores and history of isotretinoin intake within six months. The relative contraindications are pregnancy, photosensitivity and pre-pubescence.

Complications

The complications of laser hair removal are pigmentary change, scabbing, folliculitis, scarring and skin irritation.

Important aspects of hair removal by laser

Wavelength, fluence, pulse duration, cooling mechanism, spot size and repetition rate are several important aspects of hair laser to be considered during treatment. As shorter wavelength is readily absorbed by epidermal skin pigment and causes complications, it is better to use a longer wavelength for Asian skin.

Variable pulse duration is used to treat different skin colour and coarseness of hair. As a general rule, darker and coarser hair needs longer pulse duration than finer hair.

The thermal conductivity of copper is 10 times greater than sapphire. Therefore CoolGlide's contact cooling mechanism using the copper tip is more effective in cooling down the epidermis and preventing epidermal damage.

Larger spot size of 10 mm is used to target the deep chromophore in dermis in order to overcome the problem of scattering. However, smaller spot size is used in the areas of brows, ears and nostrils.

As laser hair removal depends on the delivery of energy to pigmented hair follicle in order to destroy the germinal cells, the laser works better in black terminal anagen hair. Laser hair removal, in addition, needs repeat treatment. Table 1 demonstrates the growth cycles of hair in months located on different area of body.

Table 1. Growth cycles of hair (months)

Location	Anagen	Telogen	Total
Back	3-6	3-6	6-12
Axilla	3-4	2-3	5-7
Bikini	2-3	3-4	5-7
Thigh	3-6	3-6	6-12
Calf	4-5	3-4	7-9

Learning points:

Laser removes pigmented anagen hairs and the long wavelength 1064 nm laser has the advantage in minimizing the epidermal complications in Asian.

Vascular Lesion Treatment

Introduction

Telangiectasia over the legs are common. It occurs approximately 30-40% of women and 5-10% in men. Most of them seek for medical advice because of cosmetic reasons. Sclerotherapy remains the treatment of choice, regardless of potential side effects, for vessels of 3-4 mm in diameter or greater.

Sclerotherapy

Feeder vessels in some cases may be removed surgically. Sclerotherapy proceed with largest to smallest vessels. The success rates may be as high as 80%. However, many physicians will attempt laser therapy after failure of sclerotherapy or if vessels are too small to be injected. The potential complications of sclerotherapy include pain, swelling, hyperpigmentation, matting and necrosis.

Laser vein treatment

Since 1970's, laser has been used to treat leg veins, however there was limited success till pulsed dye laser in 1980's. Carbon dioxide, pulsed-dye laser, pulsed light source and recently long pulse Nd:YAG has been used to treat leg veins. Carbon dioxide laser is limited by its non-selectivity and high absorption by water in the epidermis and dermis that cause thermal damage. Pulsed-dye laser is well absorbed by haemoglobin with penetration of approximately 1 mm. The treatment response can be unpredictable and with high incidence of purpura. Pulsed light source is well absorbed by both oxygenated and deoxygenated haemoglobin. The low selectivity causes thermal damage to surrounding tissue including epidermis. Study of pulsed light source also reported slow clearance with significant side effect. Long pulse Nd:YAG laser has excellent penetration to depth of vessels. It is much better suited for medium and large vessels than other laser using shorter wavelength. Selectivity minimizes absorption by

surrounding tissue and allows treatment of wide range of skin types.

Indications & contraindications

The good indications for laser vein treatment are lighter skin patient, minimal tanning, purplish to blue telangiectasia, spider veins and reticular veins. The contraindications of laser vein treatment are darker skin type, tanned skin, varicose vein and low pain tolerance.

Complications

The complications of long pulse Nd:YAG laser are epidermal thermal injury, blistering, ulceration, scarring, pigmentation change and thrombosis.

Learning points:

Sclerotherapy remains the treatment of choice, regardless of the potential side effects, for vessels of 3-4 mm in diameter or greater.

Non-ablative Skin Therapy "Laser Genesis"

The indications of laser genesis are diffuse redness of face secondary to rosacea or poikiloderma and visible telangiectatic vessels. Laser genesis gently heat the upper dermis that promotes the regeneration of vibrant and healthy looking skin. It is safe, effective, painless and without any problem of posttreatment purpura. The typical treatment parameter is using 13 J/cm² fluence, 0.3 ms pulse duration with 5 mm spot size. Pulses are applied with laser handpiece in constant motion over an area of approximate 4 cm x 5 cm, for about 500 pulses, and then move to next area. No cooling or gel is required. Patient usually feels good because of gradual warming. However, patient may feel discomforts if operator dwells too long. Water spray may be used to cool the skin surface and typical response is short-term erythema.

Learning points:

Laser genesis gently heat the upper dermis that promotes the regeneration of vibrant and healthy looking skin.