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Psychosocial Impact of Acne Vulgaris: Evaluating the Evidence

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ABSTRACT

This paper reviews current evidence presented by recent studies on the impact of acne on psychosocial health. Study methodologies, including case-control and cross-sectional surveys, have demonstrated psychological abnormalities including depression, suicidal ideation, anxiety, psychosomatic symptoms, including pain and discomfort, embarrassment and social inhibition. Effective treatment of acne was accompanied by improvement in self-esteem, affect, obsessive-compulsiveness, shame, embarrassment, body image, social assertiveness and self-confidence. Acne is associated with a greater psychological burden than a variety of other disparate chronic disorders. Future studies with a longitudinal cohort design may provide further validation of the causal inference between acne and psychosocial disability provided by the current literature.

Key Words: *acne, psychological well-being, Quality of Life*

The interaction of acne and psychosocial issues is complex and, in adolescence, can be associated with developmental issues of body image, socialization and sexuality. Previous studies on the psychosocial impact of acne have documented dissatisfaction with appearance, embarrassment, self-consciousness, and lack of self-confidence in acne patients. Social dysfunction has also been observed, including concerns about social interactions with the opposite gender, appearances in public, interaction with strangers, and reduced employment opportunities.

The development of psychometric scales to measure the impact of disease on abstract concepts and the notion of Quality of Life (QoL) has facilitated greater understanding of the impact of acne on psychological well-being and socialization. This paper reviews the current evidence presented by some of these studies in evaluating the impact of acne on psychosocial health.

Case-control Surveys

The majority of studies on the psychosocial impact of acne have been case reports and case-control surveys. Although case-control design studies are rapid to perform and relatively inexpensive, disadvantages include potential bias, inability to predict events of precedence, and to provide estimates on prevalence, incidence, or relative risk. The majority of these surveys are based on small samples with responses compared to historical controls or responses from other disease categories (see Table 1). Psychological abnormalities include self-reported depression and anxiety, embarrassment, social inhibition, and psychosomatic symptoms including pain and discomfort. Of particular note is that clinically important depression and anxiety were reported in 18% and 44% of acne patients, respectively.[1] Furthermore, 6% of acne patients in one study reported active suicidal ideation.[2]

Study	n	Instruments	Controls	Pre-treatment	Post-treatment
Kellet, et al. (1999)[1]	34	Hospital Anxiety Depression Scale	Normal population, general dermatology outpatients, psoriasis, oncology, and psychiatric patients	• Depression and anxiety scores greater than for general dermatology patients, psoriasis, and oncology patients • Females had more emotional distress • 18% clinically significant depression • 44% clinically significant anxiety	Improvement in obsessive-compulsiveness, shame, embarrassment perfectionism, self-consciousness, locus of control, body image
Gupta, et al. (1998)[2]	72	Carroll Rating Scale for Depression	Inpatients and outpatients with alopecia areata, atopic dermatitis, psoriasis	Depression scores higher than alopecia areata, atopic dermatitis, psoriasis outpatients 6% expressed active suicidal ideation compared to none in alopecia areata and 2% each in atopic dermatitis and psoriasis outpatients	
Mallon, et al. (1999)[3]	111	Dermatology Life Quality Index, Rosenberg measure of self-esteem, General Health Questionnaire 28, Short-	Population sample 18-64 yrs.	• 41% possible cases of non-psychotic psychiatric disorder • impairment in mental health, social functioning, energy, role limitations • mental health scores worse than for asthma, epilepsy, diabetes, back pain, arthritis, coronary artery disease • No correlation with acne grade	
Klassen, et al. (2000)[4]	130	Dermatology Life Quality Index, EuroQoL, Short-Form 36	Population sample 20-39 yrs.	Pain/discomfort, anxiety/depression, lower perceived health status	Improvement in all parameters
Lasek, et al. (1998)[5]	60	Skindex	Patients with psoriasis, benign skin lesions, healthy volunteers	Most bothersome feature of acne: appearance Functioning, emotions, and symptoms Greater effects on QoL with more severe acne grade and age	Improvement in all parameters / older patients more likely to report no improvement in their acne
Krowchuk, et al.	39	Piers-Harris self-concept scale	Normative	Embarrassment and social inhibition	▭ embarrassment, social inhibition, greater acceptability of facial appearance to peers
Myhill, et al.	94	Specific questionnaires	Adult normal controls, adolescent high school students	No difference compared to controls	Improved social assertiveness, social appraisal, confidence
Grahame, et al. (2002)[8]	34	Hospital Anxiety Depression Scale, Rosenberg self-esteem, Positive/ negative affectivity	Self control		▭ self-esteem, positive affect ▭ anxiety, depression, negative affect
Van der Meeren, et al. (1985)[9]	40	Amsterdam biographic questionnaire, social anxiety scale	Normal adult and student population	▭ neuroticism, psychosomaticism, anxiety	

Table 1: Case-control surveys: psychosocial effects of acne vulgaris

Study	Sample	Psychometric Instrument	Controls	Findings
Aktan, et al. (2000)[11]	2657 students	HAD	Unaffected cohort	No difference in depression or anxiety scores
Smithard, et al. (2001)[12]	317 students	SDQ	Unaffected cohort	Higher levels emotional and behavioural difficulties

Table 2: Cross-sectional surveys: psychosocial effects of acne vulgaris

Patients with acne had greater impairment in mental health scores compared with those with asthma, epilepsy, diabetes, back pain, arthritis, or coronary artery disease.[3] Furthermore, acne patients reported higher depression and anxiety scores when compared to psoriasis patients and those attending oncology or general dermatology clinics.[1,2] Longitudinal evaluation of psychometric outcomes has demonstrated that effective treatment of acne was accompanied by improvement in self-esteem, affect, obsessive-compulsiveness, shame, embarrassment, body image, social assertiveness, and self-confidence. The majority of these patients were treated with oral isotretinoin (71%).[1,4-7] Unemployment in acne patients was evaluated in 625 patients aged 18-30 years in Leeds, England. Controls were randomly selected patients from general practitioner records and matched for age and gender. This study revealed that unemployment levels were significantly higher among acne patients of both genders compared to controls (16% vs. 9% in males; 14% vs. 9% in females; $p<0.001$). However, social status, academic background, and intelligence were not included in the analysis.[10]

Cross-sectional Population Surveys

Cross-sectional studies are more rapid and less expensive to conduct than cohort studies. They are useful for controlling subject selection and controlling measurements, and can yield prevalence data. A particular limitation is the difficulty of establishing causal relationships or sequencing of events. There are a limited number of these studies in the literature evaluating the association of acne and psychological disturbances in the context of the general population (see Table 2).

A recent survey of 2,657 students from Turkey, aged 14-20 years, detected a prevalence of acne, anxiety and depression of 23%, 25%, and 13% respectively. In addition, the Hospital Anxiety and Depression scale (HAD), was administered to 308 acne patients whose responses were compared to responses of the same number of gender-matched controls. No differences were detected in the subscale scores for anxiety or depression in acne versus control subjects. Limitations of this scale include uncertain sensitivity and responsiveness in detecting psychological abnormalities in a relatively young outpatient population, and specificity in determining attributability of anxiety and depression to acne.[11]

In a survey of 317 students aged 14-16 from England, an age-appropriate, validated scale, i.e., the Strengths and Difficulties Questionnaire (SDQ), was used to assess psychological health. Subjects with acne were twice as likely to score in the borderline or abnormal range of the SDQ compared to unaffected students. Furthermore, the presence of acne was associated with higher levels of emotional and behavioral difficulties.[12]

Cohort Studies

While a prospective longitudinal cohort study is the most powerful trial design for evaluating incidence and investigating potential causes of psychosocial dysfunction in acne patients, such a survey has not been performed. A cohort of school children followed from pre-adolescence to early adulthood would be of particular value in determining the sequence of events in the complex interaction of acne and psychological changes of adolescence, and in providing estimates of incidence and relative risks of these outcomes. Such a survey may be a relatively inexpensive extension or addition to longitudinal studies on general health in the pediatric population.

Summary

Acne vulgaris is associated with excess psychosocial morbidity, which can be reduced by effective treatment. Furthermore, acne is associated with a greater psychological burden than a variety of other disparate chronic disorders. The causal inference provided by current literature between acne and psychosocial disability requires validation by a longitudinal cohort evaluation.

References

1. Kellett SC, Gawkrodger DJ. The psychological and emotional impact of acne and the effect of treatment with isotretinoin. *Br J Dermatol* 140(2):273-82 (1999 Feb).
2. Gupta MA, Gupta AK. Depression and suicidal ideation in dermatology patients with acne, alopecia areata, atopic dermatitis and psoriasis. *Br J Dermatol* 139(5):846-50 (1998 Nov).
3. Mallon E, Newton JN, Klassen A, Stewart-Brown

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Ciclopirox (Loprox®) Gel for Superficial Fungal Infections

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ABSTRACT

Ciclopirox (Loprox®) is a broad-spectrum antifungal medication that also has antibacterial and anti-inflammatory properties. Its main mode of action is thought to be its high affinity for trivalent cations, which inhibit essential co-factors in enzymes. Clinical trials have shown that ciclopirox gel is a successful treatment for seborrheic dermatitis of the scalp as well as for tinea pedis. Adverse effects are generally mild and include a skin-burning sensation, contact dermatitis, and pruritus. Ciclopirox is indicated in the US for the treatment of tinea pedis, tinea corporis, pityriasis versicolor, seborrheic dermatitis, and cutaneous candidiasis.

Key Words: *ciclopirox, tinea, superficial fungal infection*

Ciclopirox (Loprox®, Medicis), a hydroxypyridone derivative, is the ethanolamine salt of 6-cyclohexyl-1-hydroxy-4-methyl-2(1H)-pyridone.[1] Randomized controlled trials have demonstrated the efficacy and safety of ciclopirox in a number of indications in which the causative organism was a dermatophyte or a yeast.[2-4]

Mechanism of Action

Unlike antifungals such as itraconazole and terbinafine, which affect sterol synthesis, ciclopirox is thought to act through the chelation of polyvalent metal cations, such as Fe3+ and Al3+. These cations inhibit many enzymes, including cytochromes, thus disrupting cellular activities such as mitochondrial electron transport processes and energy production.[1,5] Ciclopirox also appears to modify the plasma membrane of fungi,[6] resulting in the disorganization of internal structures.[7]

Pharmacokinetics

Ciclopirox when applied to cadaverous skin has resulted in higher concentrations of the drug in the epidermis and dermis than the minimal inhibitory concentration (MIC) required for sensitive organisms.[2] Furthermore, in cadaverous skin, ciclopirox caused complete inhibition of *T. mentagrophytes* after both 4 and 24 hours of exposure.[8]

Loprox® gel was applied for 14.5 days (15g/day) in a clinical study involving 16 men with moderate-to-severe tinea cruris. The mean (±SD) dose-normalized values of C_{max} for total ciclopirox in serum increased from 100 (±42)ng/ml on day 1 to 238 (±144)ng/ml on day 15. Approximately 10% of the administered dose was excreted in the urine during the 10 hours after dosing on day 1.[9]

Antifungal, Antibacterial, and Anti-inflammatory Activity

Ciclopirox exhibits either fungistatic or fungicidal activity *in vitro* against a broad spectrum of fungal organisms, such as dermatophytes, yeasts, dimorphic fungi, eumycetes, and actinomycetes.[3] In addition to its broad spectrum of action, ciclopirox also exerts antibacterial activity against many Gram-positive and Gram-negative bacteria.[2] Furthermore, the anti-inflammatory effects of ciclopirox have been demonstrated in human polymorphonuclear cells, where ciclopirox has inhibited the synthesis of prostaglandin and leukotriene.[2] Ciclopirox can also exhibit its anti-inflammatory effects by inhibiting the formation of 5-lipoxygenase and cyclo-oxygenase.[10,11]

Clinical Trials

The efficacy of ciclopirox gel 0.77% in the treatment of seborrheic dermatitis of the scalp has been compared with its vehicle in a multicenter, randomized, double-blind study (n=178).[12] The gel was applied twice daily for 28 days, with a final visit up to day 33. In the ciclopirox group, global evaluation scores were significantly better than those of the vehicle group at days 22 and 29, and at endpoint ($p<0.01$). The number of subjects with at least 75% improvement was significantly different from the vehicle after only 2 weeks of treatment up until the endpoint visit ($p<0.01$).[12]

In a multicenter, double-blind, clinical study, ciclopirox gel 0.77% has been shown to be more effective than its vehicle in the treatment of tinea pedis.[13] A total of 374 subjects with interdigital tinea pedis were enrolled and they applied either ciclopirox 0.77% gel or the vehicle gel twice daily for 28 days, with a final visit up to day 50. At day 43, 2 weeks post-treatment, the pooled data revealed that 85%

of ciclopirox subjects were mycologically cured (negative KOH and culture), compared to only 16% of vehicle subjects (p=0.05). At endpoint, 60% of the ciclopirox subjects achieved treatment success, defined as mycological cure with ≥75% clinical improvement, compared to 6% of the vehicle subjects (p=0.05).[13]

Adverse Effects

In clinical trials, 140 of 359 subjects (39%) treated with ciclopirox gel reported adverse experiences. The most frequent complaint was a skin-burning sensation upon application, which occurred in approximately 34% of seborrheic dermatitis patients and 7% of tinea pedis patients. Also, reports of contact dermatitis and pruritus occurred in 1-5% of the subjects. Other reactions that occurred in less than 1% included dry skin, acne, rash, alopecia, pain upon application, eye pain, and facial edema.[9]

Dosage and Administration

Ciclopirox gel should be gently massaged into the affected areas and surrounding skin twice per day, in the morning and evening, immediately after cleaning or washing the areas to be treated. A 4-week, twice daily application has been used in the treatment of interdigital tinea pedis, tinea corporis, and scalp seborrheic dermatitis with ciclopirox gel.[9]

Conclusion

Superficial fungal infections caused by dermatophytes and yeasts have been successfully and safely treated with ciclopirox. The gel formulation is beneficial in the treatment of fungal infections due to its antifungal, antibacterial, and anti-inflammatory properties.

References

1. Sakurai K, Sakaguchi T, Yamaguchi H, Iwata K. Mode of action of 6-cyclohexyl-1-hydroxy-4-methyl-2(1H)-pyridone ethanolamine salt (Hoe 296). *Chemotherapy* 24(2):68-76 (1978).
2. Abrams BB, Hanel H, Hoehler T. Ciclopirox olamine: a hydroxypyridone antifungal agent. *Clin Dermatol* 9(4):471-7 (1991 Oct-Dec).
3. Gupta AK. Ciclopirox: an overview. *Int J Dermatol* 40(5):305-10 (2001 May).
4. Korting HC, Grundmann-Kollmann M. The hydroxypyridones: a class of antimycotics of its own. *Mycoses* 40(7-8):243-7 (1997 Nov).
5. Gupta AK, Sauder DN, Shear NH. Antifungal agents: an overview. Part I. *J Am Acad Dermatol* 30(5 Pt 1):677-98 (1994 May).
6. Gasparini G, Contini D, Torti A, Guidarelli C, Lasagni A, Caputo R. The effect of ciclopiroxolamine investigated by means of the freeze-fracture technique. *Mykosen* 29(11):539-44 (1986 Nov).
7. Del Palacio-Hernanz A, Guarro-Artigas J, Figueras-Salvat MJ, Esteban-Moreno J, Lopez-Gomez S. Changes in fungal ultrastructure after short-course ciclopiroxolamine therapy in pityriasis versicolor. *Clin Exp Dermatol* 15(2):95-100 (1990 Mar).
8. Kligman AM, McGinley KJ, Foglia A. An *in vitro* human skin model for assaying topical drugs against dermatophytic fungi. *Acta Derm Venereol* 67(3):243-8 (1987).
9. Loprox® Gel (ciclopirox) 0.77% Package insert. 2000. Phoenix, AZ, Hoechst Marion Roussel Deutschland GmbH.
10. Bohn M, Kraemer KT. Dermatopharmacology of ciclopirox nail lacquer topical solution 8% in the treatment of onychomycosis. *J Am Acad Dermatol* 43(4 Suppl):S57-69 (2000 Oct).
11. Hanel H, Smith-Kurtz E, Pastowsky S. [Therapy of seborrheic eczema with an antifungal agent with an antiphlogistic effect]. *Mycoses* 34 Suppl 1:91-3 (1991).
12. Aly R, Katz HI, Kempers SE, et al. Ciclopirox gel

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Ablative Laser Resurfacing – Postoperative Care

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ABSTRACT

Wound care after laser skin resurfacing (LSR) is critical for achieving a successful result. The superficial thermal injury created by LSR heals more quickly and with a reduced risk of scarring under occlusion. While open and closed wound care regimens can be employed to expedite reepithelialization, closed methods with semi-occlusive dressings may decrease morbidity. Effective medications and management techniques can help to minimize expected effects of the procedure such as crusting, discomfort, pruritus, erythema, and swelling.

Key Words: *laser skin resurfacing, wound care, postoperative care*

Laser skin resurfacing (LSR) for the rejuvenation of facial skin remains a popular cosmetic procedure. Meticulous postoperative care is essential and is as important as intraoperative technique in achieving optimal results after laser ablation. Epidermal regeneration following the thermal injury of LSR is improved in a moist environment, since a dry crust or scab impedes keratinocyte migration.[1] Both open and closed wound care methods can be applied to minimize morbidity and expedite postoperative wound healing. Numerous studies indicate that closed wound care regimens utilizing occlusive dressings for 48-72 hours postoperatively may hasten reepithelialization and reduce crusting, discomfort, erythema, and swelling.[2-4] Appropriate medications and management techniques can also minimize the predictable effects of LSR. Resurfacing with carbon dioxide (CO_2) or Erbium:YAG lasers results in ablation of the epidermis and upper papillary dermis. During reepithelialization, the wound produces copious serous discharge along with sloughing of denatured collagen. Resultant crusting may predispose the wound to secondary infection. Other immediate expected sequelae of LSR include discomfort, pruritus, erythema, and edema. Reepithelialization after resurfacing occurs at a mean of 8.5 days after CO_2 and a mean of 5.5 days after Erbium:YAG lasers.[5]

Wound Care Methods

Open wound care techniques allow ongoing surveillance of resurfaced skin; as well they minimize the feeling of claustrophobia by the patient. These regimens, theoretically, would seem to be less likely to foster infection, since there is no dressing under which bacteria may be trapped.[6] However, open methods may be more painful and inconvenient for the patient. Most open wound care regimens consist of frequent soaks with 0.25% acetic acid, normal saline, or cool tap water lasting 20 minutes every 2-4 hours, followed by gentle wiping of the skin. Cold compresses are immediately followed by the application of a bland emollient ointment. Popular ointments include Catrix®-10 (Lescarden) and Aquaphor® Healing Ointment (Beiersdorf AG). Patients are routinely seen on the first and third days postoperatively, and any

	Open Wound Care	Closed Wound Care
Dressing Applied	None	48-72 hours
Saline Soaks	20min q2-4hrs, 24hrs/d, until reepithelialized	With dressing: 20min, q2-4hrs while awake After dressing off: 20min, q2-4hrs, 24hrs/d, until reepithelialized
Gentle Debridement	Crust removed all areas	Crust removed from uncovered areas
Emollient Ointment	After soaks q2-4hrs	After soaks q2-4hrs

Table 1: Comparison of open and closed wound care techniques

excess crust is gently removed with saline. The frequency of soaks and ointment application decreases as reepithelialization progresses and is tapered off when reepithelialization is complete. Gentle cleansings begin a day or two later. The use of ointment is replaced during the day by use of a lighter moisturizer-sunscreen. At nighttime, ointment is more slowly replaced.

Dressings utilized in closed wound care techniques provide a semi-occlusive environment that may protect the wound from exogenous bacteria and foster exchange of oxygen and water vapor.[7] Drainage of the wound exudates via the dressing may prevent excess crust and simplify wound management. Popular dressings include the composite foam Flexzan® (Dow Hickam Pharmaceuticals), the hydrogel product 2nd Skin® (Bionet), the plastic mesh N-terface® (Winfield Laboratories), and the polymer film Silon-TSR® (Bio Med Sciences).

After LSR, occlusive dressings are applied for 2-3 days postoperatively. Longer applications increase the risk of bacterial or fungal colonization and infection with subsequent scarring.

We prefer the Silon-TSR®, a silicone dressing with a polytetrafluorethylene inner polymer network. Immediately after the procedure, the face is blotted dry and the dressing is applied. The dressing comes in a transparent face mask design with perforations to allow excess fluid drainage. Drawstrings tied behind the head hold the mask in place. Openings are cut for the eyelids, nose, and central lips, and a smaller patch of dressing is applied to cover the nasal bridge. Gauze 4 x 4 dressings are applied over the mask to absorb exudates and are held in place by tube gauze.

Patients are seen on the first postoperative day and the tube gauze and 4 x 4 gauze are removed. The resurfaced area is inspected through the mask, and accumulated exudate or crust is removed from uncovered areas with saline. Patients are instructed to begin ice-water soaks through the mask for 20 minute periods at 2-4 hour intervals while awake. Patients return at the third postoperative day and the dressing is removed. Patients continue soaks at 3-4 hour intervals followed by application of Aquaphor® healing ointment. By 7-10 days after the procedure, soaks are replaced with gentle cleansing, and patients switch to the application of a moisturizer-sunscreen.

Antibiotic ointment should be avoided in both open and closed wound care regimens. Bacitracin contained in antibiotic ointments is a common cause of allergic contact dermatitis after resurfacing.[8]

Medications

Regardless of the wound care technique chosen, certain medications and principles of postoperative management can help to reduce morbidity. Postoperative infection can cause permanent scarring. Prophylactic antibiotics such as dicloxacillin or azithromycin are begun at least 24 hours before LSR and continued for a minimum of 5 days postoperatively. Antivirals such as acyclovir or valacyclovir are also begun 24 hours before LSR and continued until epithelialization is complete (10 days). Recovering patients are advised to avoid contact with anyone actively infected with herpes simplex virus.

Patients often awaken after LSR with mild burning discom-

Infection Prophylaxis – 24 hrs preop	Antibiotics	Dicloxacillin or azithromycin x 5 days
	Antivirals	Acyclovir or valacyclovir x 10 days
Pain Management	Mild	Acetaminophen 1000mg q6hrs
	Moderate	Tylenol® w/codeine or Vicodin® 1-2 tabs q6hrs
	Severe	Investigate infection or other complications Consider morphine or Demerol®
Pruritus Management	Mild	Atarax® 25mg q.h.s.
	Moderate	Atarax® 25mg or Benadryl® 25-50mg t.i.d.
	Severe	Doxepin® 25-50mg q.h.s., topical steroids Consider systemic corticosteroids
Erythema & Hyperpigmentation		Hydroquinone: preop x 1m; post-epithelialized Aggressive sun protection

Table 2: Medical management after laser skin resurfacing

fort, and over 80% note pain in the immediate postoperative period.[9] This can be minimized by intraoperative use of supplemental local anesthesia as well as ketorolac (Toradol®) 60mg IM.[10] After the procedure, ice packs, cold compresses and acetaminophen help to alleviate pain. Approximately 85% of patients require pain medications for the first 3 days postoperatively,[3] and those not relieved by acetaminophen often benefit from acetaminophen with codeine phosphate (Tylenol® with Codeine) or acetaminophen with hydrocodone bitartrate (Vicodin®) 1 to 2 tablets every 6 hours as needed. Mild-to-moderate pruritus occurs during reepithelialization and typically lasts about 10 days. Recent evidence suggests that this symptom relates to a yeast infection or colonization in healing skin.[11] Pruritus is often relieved by cool compresses and emollients. Over half of all patients require antihistamines such as hydroxyzine hydrochloride (Atarax®) 25mg at night. Moderate pruritus is often controlled with diphenhydramine hydrochloride (Benadryl®) 25-50mg or hydroxyzine hydrochloride (Atarax®) 25mg 2-3 times daily.[9] In cases of severe pruritus, medium-to-high potency topical steroids, more potent antihistamines such as doxepin 25-50mg at night, and very rarely, systemic corticosteroids may be required. Control of pruritus is essential since excoriation may result in scarring.

Immediate Predictable Effects of LSR

Erythema typically occurs for up to several months after LSR. The mean maximum severity is reduced, and the duration of noticeable erythema and the time until complete resolution of erythema are shorter in patients treated with closed as compared to open wound care techniques.[3] Erythema can be camouflaged with make-up containing green foundation. In addition, sun protection and avoidance should be encouraged during the entire period of post-LSR erythema to minimize post-inflammatory hyperpigmentation. This is particularly important in patients with skin phototypes III through VI. Hyperpigmentation occurs in nearly a third of patients. Preoperative hydroquinone for at least 1 month prior to LSR may decrease this risk.[12]

Edema develops in the first 48 hours postoperatively. The severity can be controlled with ice packs and head elevation at night. In cases where marked edema develops during or immediately after the procedure, oral corticosteroids may be necessary. The time until complete resolution of edema is significantly less when closed dressings are utilized than with open wound care postoperatively.[3]

Conclusion

In addition to explicit instructions to patients for postoperative care, careful physician follow-up is essential for at least several months after LSR to observe for side-effects and complications. In most cases, untoward effects can be completely reversed if treated promptly and effectively. In addition, ongoing follow-up care can help to reinforce shared, realistic expectations of the physician and patient regarding possible outcomes of the procedure and may influence patient satisfaction after LSR.[13]

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References

1. Collawn SS. Occlusion following laser resurfacing promotes reepithelialization and wound healing. *Plast Reconstr Surg* 105(6):2180-9 (2000 May).
2. Goldman MP, Roberts TL 3rd, Skover G, Lettieri JT, Fitzpatrick RE. Optimizing wound healing in the face after laser ablation. *J Am Acad Dermatol* 46(3):399-407 (2002 Mar).
3. Batra RS, Ort RJ, Jacob C, Hobbs L, Arndt KA, Dover JS. Evaluation of a silicone occlusive dressing after laser skin resurfacing. *Arch Dermatol* 137(10):1317-21 (2001 Oct).
4. Newman JP, Koch RJ, Goode RL. Closed dressings after laser skin resurfacing. *Arch Otolaryngol Head Neck Surg* 124(7):751-7 (1998 Jul).
5. Alster TS, Lupton JR. Prevention and treatment of side effects and complications of cutaneous laser resurfacing. *Plast Reconstr Surg* 109(1):308-16 (2002 Jan).
6. Christian MM, Behroozan DS, Moy RL. Delayed infections following full-face CO2 laser resurfacing and occlusive dressing use. *Dermatol Surg* 26(1):32-6 (2000 Jan).
7. Newman JP, Fitzgerald P, Koch RJ. Review of closed dressings after laser resurfacing. *Dermatol Surg* 26(6):562-71 (2000 Jun).
8. Lowe NJ, Lask G, Griffin ME. Laser skin resurfacing. Pre- and posttreatment guidelines. *Dermatol Surg* 21(12):1017-9 (1995 Dec).
9. Batra RS, Dover JS, Hobbs L, Phillips TJ. Evaluation of the role of exogenous estrogen in postoperative progress after laser skin resurfacing. *Dermatol Surg* 29(1):43-8 (2003 Jan).
10. Dover, JS, Arndt, KA, Geronemus, RG, Alora, MBT, editors. *Illustrated Cutaneous & Aesthetic Surgery, 2nd ed*. Stamford, CT: Appleton & Lange (2000).
11. Alam M, Pantanowitz L, Harton AM, Arndt KA, Dover JS. A prospective trial of fungal colonization after laser resurfacing of the face: correlation between culture positivity and symptoms of pruritus. *Dermatol Surg 29* (3):255-60 (2003 Mar).
12. Bernstein LJ, Kauvar AN, Crossman MC, Geronemus RG. The short- and long-term side effects of carbon dioxide laser resurfacing. *Dermatol Surg* 23(7):519-25 (1997

Jul).
13. Batra RS, Jacob CI, Hobbs L, Arndt KA, Dover JS. A prospective survey of patient experiences after laser skin resurfacing: results from 2 1/2 years of follow-up. *Arch Dermatol* 139(10):1295-9 (2003 Oct).

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for seborrheic dermatitis of the scalp. *Int J Dermatol* 42 Suppl 1:19-22 (2003 Sep).
13. Aly R, Fisher G, Katz HI, et al. Ciclopirox gel in the treatment of patients with interdigital tinea pedis. *Int J Dermatol* 42 Suppl 1:29-35 (2003 Sep).

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SL, Ryan TJ, Finlay AY. The quality of life in acne: a comparison with general medical conditions using generic questionnaires. *Br J Dermatol* 140(4):672-6 (1999 Apr).
4. Klassen AF, Newton JN, Mallon E. Measuring quality of life in people referred for specialist care of acne: comparing generic and disease-specific measures. *J Am Acad Dermatol* 43(2 Pt 1):229-33 (2000 Aug).
5. Lasek RJ, Chren MM. Acne vulgaris and the quality of life of adult dermatology patients. *Arch Dermatol* 134(4):454-8 (1998 Apr).
6. Krowchuk DP, Stancin T, Keskinen R, Walker R, Bass J, Anglin TM. The psychosocial effects of acne on adolescents. *Pediatr Dermatol* 8(4):332-8 (1991 Dec).
7. Myhill JE, Leichtman SR, Burnett JW. Self-esteem and social assertiveness in patients receiving isotretinoin treatment for cystic acne. *Cutis* 41:171-3 (1988).
8. Grahame V, Dick DC, Morton CM, Watkins O, Power KG. The psychological correlates of treatment efficacy in acne. *Dermatol Psychosom* 3(3):119-25 (2002 Sep).
9. Van der Meeren HLM, van der Schaar WW, van den Hurk CMAM. The psychological impact of severe acne. *Cutis* 36(1):84-6 (1985 Jul).
10. Cunliffe WJ. Acne and unemployment. *Br J Dermatol* 115(3):386 (1986 Sep).
11. Aktan S, Ozmen E, Sanli B. Anxiety, depression, and nature of acne vulgaris in adolescents. *Int J Dermatol* 39(5):354-7 (2000 May).
12. Smithard A, Glazebrook C, Williams HC. Acne prevalence, knowledge about acne and psychological morbidity in mid-adolescence: a community-based study. *Br J Dermatol* 145(2):274-9 (2001 Aug).

Update on Drugs

Class	Name/Company	Approval Dates and Comments
Immuno-modulatory Agent	**Etanercept** *Enbrel®* Amgen and Wyeth Pharmaceuticals	The US FDA approved this biologic drug in May 2004, to treat chronic moderate-to-severe plaque psoriasis in adults. It is already approved for the treatment of psoriatic arthritis.
Immuno-modulatory Agent	**Alefacept** *Amevive®* Biogen Idec	The Israeli Ministry of Health approved this biologic therapy in May 2004, for the treatment of adult patients with moderate-to-severe chronic plaque psoriasis who are candidates for systemic therapy or phototherapy. Amevive® also received approval from the Therapeutic Goods Administration in Australia in June 2004, for the same indication.
Drug News		
Antibacterial Agent		By the end of 2004, Chiron Corp. plans to submit a Marketing Authorization Application to the European Medicines Agency (EMEA) under the centralized filing procedure for approval to market CUBICIN® for the treatment of complicated skin and soft tissue infections where the presence of susceptible Gram-positive bacteria is confirmed or suspected. It is currently approved in the US for this indication.
Atopic Dermatitis		New data presented in May 2004, at the Society for Investigative Dermatology meeting in Providence, Rhode Island, USA, shed further light on the pharmacological profile of Elidel® Cream 1%, (pimecrolimus, Novartis) by showing that it permeates through the skin into the bloodstream up to six times less than Protopic® (tacrolimus, Fujisawa and GlaxoSmithKline). As a result of this low permeation through skin, the risk of systemic effects associated with topical application of Elidel® is considered to be minimal.
Antibacterial Research		According to a report published in the May 1 issue of the *Journal of Infectious Diseases*,* previous antibiotic use and a genetic predisposition are identified as two major risk factors for community-acquired skin infections caused by methicillin-resistant *Staphylococcus aureus* (MRSA). Until recently, drug-resistant strains were considered to be acquired almost exclusively in hospital settings, but reports of MRSA acquired in the community are increasing, and are most often associated with skin and soft-tissue infections such as furunculosis and cellulitis. **J Infect Dis 189(9):1574-84 (2004 May)*
Antipsoriatic Agent		Preliminary data from two studies showing encouraging results in treating psoriatic arthritis with HUMIRA® (adalimumab, Abbott Laboratories) 40mg every other week were presented at the European League Against Rheumatism (EULAR) annual congress in June 2004 in Berlin, Germany. Patients with psoriatic arthritis responded to HUMIRA® treatment as early as 2 weeks after the initial dose, showing significant improvement in the signs and symptoms of the joint disease and skin manifestations with continued improvements at 12 weeks.

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