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ACNE, A COMMON BUT MISUNDERSTOOD DISEASE

Professor of Dermatology, Dr Tony Chu explains what you need to know about acne and the management of the active disease

Acne is the commonest disease of the skin to affect man but is still poorly understood by the public, and often poorly treated by healthcare professionals. In this article, I will address the management of active acne; if acne is treated early and well, scarring does not occur. When atrophic scarring does occur, there have been major advances in treating these with needling, subcision and TCA-CROSS (Trichloracetic Acid - Chemical Reconstruction of Scarring Skin); but that will not be covered in this particular article.

Acne has become a 'dirty' word and is not something that people want to admit to. When lecturing medical students at Imperial College, I would ask how many suffered or had suffered from acne. A dozen hands would go up. I would go on to ask, "*How many of you have had a spot or blackhead?*". The other three hundred hands would then go up. Acne affects almost everyone and represents a spectrum from mild with a few blackheads and occasional inflammatory spots to fulminant, covering the face, back, chest, arms, and legs with painful inflamed spots.

The myths surrounding acne are very much the sticks to beat you with. "If you eat that chocolate you will get spots", wrong! "It's because you don't wash", wrong! "It's because you are not a nice person", wrong! People with acne often feel guilty and are made to feel that it's their fault. There is also a widespread feeling that it is too trivial to bother your doctor with, but being reassured that 'you will grow out of it' results in the patient not seeking help until it is bad enough to leave permanent scarring.

Acne is also very visible, and because the inflammatory spots are red and pussy, they look infected, which they are not. The inflammation is due to an immunological response to the *Cutibacterium acnes* (*C. acnes*) and cannot be passed from one person to another. It is also the brunt of the joke, with acne seen in the media as something to laugh about; how many of you remember Peter Cook's number one hit – *The Ballad of Spotty Muldoon?*

Acne is a scarring disease and can scar both the skin and the psyche. The physical scarring can be helped with modern developments in scar treatment, but the psychological scarring may be a lifelong problem. Loss of confidence, depression, reclusiveness and suicidal ideation are all common in the acne sufferer, and dysmorphophobia (body dysmorphic disorder) is not uncommon either, where even mild acne can result in severe psychological reactions.

The pathophysiology of acne is very simple; it is an overreaction of the skin to generally normal levels of androgens that leads to increased sebum production, which is deficient in linoleic acid. The **primary lesion of acne is the microcomedone**, a partial blockage at the ostium of the hair follicle due to hypercornification. The cause of this is controversial, but studies have shown that immune response with interleukin-1 or deficiency of linoleic acid in sebum can cause follicular hypercornification. Sebum flow is restricted with the proliferation of the anaerobic commensal bacterium, *C. acnes*. Inflammation is caused by a T cell response to the bacterial antigens, and resulting recruitment of polymorphs leads to pus formation. If the pus escapes through the follicle to the surface, then things will settle without scarring. If the pus is more deeply seated, and cannot escape to the surface, the follicle may rupture

leading to damage to the collagen and atrophic scarring. Resolution is due to immune tolerance developing to the bacterial antigens, but there is no way to predict how long this will take. For me, it was ten years, but studies have shown that acne is persisting later in many people, with an incidence of 15% of women with acne over the age of fifty years in one study in the USA. Never tell a patient they will grow out of it - it will come back to haunt you.

Treatment of acne is therefore very straightforward in the majority of patients. Target the primary lesion with a topical retinoid, or other agents that can tackle the follicular hypercornification, and treat the inflammatory lesions with topical or oral antibiotics or antibacterial agents. **Unless you are targeting the primary lesion, you are not treating the patient properly.**

How is acne normally treated in the community? In many sufferers, it is not treated, mainly due to a reluctance to bother their GP. Patients may self-medicate, often with poor advice from the pharmacist. Most patients visiting their GP are given a topical or oral antibiotic which will help reduce the inflammatory lesions, but everything will flare up again when they stop. My own experience is probably fairly typical; aged 13, I visited my GP on my own, my mother had told me not to bother as I would grow out of it, but I was worried. I was prescribed a foul-smelling sulphur cream which made things worse. Having lost confidence, I did not return to my GP for three years, at which time my self-confidence had reached rock bottom. This time, I was given oxytetracycline, but there was no way I could take it properly, (four times a day on an empty stomach and not eating for an hour), it had minimal effect, and everything worsened when I stopped. I did not bother going back to the GP.

Targetting the microcomedone

The first-line treatment of follicular hypercornification is the use of a retinoid. Retinoids normalise the growth of keratinocytes, thus inhibit the abnormal growth occurring in acne so that the microcomedones are shed and do not form. Topical retinoids should be prescribed to all patients with acne, apart from women who are trying to conceive or are pregnant and those who cannot tolerate them. Overuse of retinoids is usually the cause of irritation; a pea-sized amount is enough to treat the whole face and should be used at night as it can cause increased photosensitivity. Remember that all sites affected must be treated; this must be explained to patients, as many will only apply it to the spots. For those who cannot use topical retinoids, there are alternatives. Salicylic acid is keratolytic and will dissolve the hypercornification; it is not as effective as retinoids, but can be used as a 2% wash at night. Salicylic acid peels – the one I use is the Enerpeel SA - reduce the thickness of the stratum corneum and unseat microcomedones; they are very useful adjunctive treatments. Azelaic acid has mild comedolytic activity, but its main effect is anti-inflammatory. Tebiskin OSK Lotion and Creams is the medication that I use in a lot of my patients, and particularly in women who are trying to conceive or who are pregnant; it has three main ingredients, triethyl citrate, ethyl linoleate and GT Peptide 10. The triethyl citrate is broken down by bacterial enzymes in the follicle, to citric acid which dramatically reduces the pH, and this inhibits the enzyme 5a-reductase and thus activation of testosterone, which results in a 53% average reduction of sebum production. The lower pH also eradicates bacteria (96% including all antibiotic resistant in a recent study). The ethyl linoleate is broken down to linoleic acid, which increases the percentage of linoleic acid in the sebum, and reduces comedogenesis.

Essential treatment in all patients with acne	
Target the follicular hypercornification	
First-line	Topical retinoid used sparingly to all affected areas at night
Second-line or where retinoids are contraindicated	Tebiskin OSK Lotion 2% salicylic acid wash 30% salicylic acid peels 20% azelaic acid

Treating inflammatory lesions

In mild to moderate acne, start with topical agents. These include antibiotics, benzoyl peroxide, azelaic acid and Aknicare lotion. Antibiotic drug resistance in *C. acnes* rapidly develops with topical antibiotics and can be avoided by using a combination of antibiotic and benzoyl peroxide. Benzoyl peroxide works by introducing oxygen into the follicle which kills anaerobic *C. acnes* and resistance does not develop.

Oral antibiotics are the treatment of choice in patients not responding to topical agents or those with more severe disease. Avoid Oxytetracycline and Erythromycin as they have short half-lives, need to be taken four times a day, and are inhibited by food in the stomach – fat and iron with tetracycline and carbohydrates with Erythromycin. Lymecycline is a much better Tetracycline, and Clarithromycin is a better Macrolide. Other very useful second-line antibiotics include Doxycycline, Trimethoprim and Clindamycin. Antibiotics work by killing bacteria, but possibly their main action is as anti-inflammatory agents. There is no such thing as a course of antibiotics for acne, but once control is achieved they can be substituted for a topical agent.

Oral isotretinoin (Roaccutane®)

Roaccutane® is the most powerful drug we have for acne. It works on all stages of the pathogenesis of the disease, reducing sebum production by up to 90%, normalising keratinocyte growth which prevents comedogenesis, killing *C. acnes* and reducing inflammation. It is licenced for patients with severe acne who are not responding to conventional treatment. However, it is grossly overused, and I have seen many patients asking for a second opinion who have been offered Roaccutane for only mild acne. Roaccutane does not always cure acne and up to 50% of patients relapse after a full course. Side effects are also unpredictable; almost everyone gets symptomatic side effects with xerosis, eczematisation, myalgias, arthropathies, photosensitivity and night blindness. These generally resolve when the drug is stopped, but may cause major problems. Professional footballers that I have treated had to

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stop Roaccutane due to severe myalgia, which meant they could not train, and night blindness means that an aircraft pilot is banned from flying while on the drug.

Roaccutane commonly affects concentration which can have a major impact on those taking exams, so should be avoided at these times. Roaccutane is also associated with some severe side effects, which are completely unpredictable. You cannot look at your patients and say that they will not get one of these; even though they are very rare, affecting 1 in 2 million patients treated.

Severe and Unpredictable Side Effects of Roaccutane	
Acne fulminans	Acne fulminans occurs after about 4 weeks of treatment with severe nodulocystic acne developing in affected and previously unaffected sites, leaving severe scarring.
Severe depression and suicide	Severe depression occurs in those with no previous history of depression and has resulted in suicide.
Acute schizophrenia	
Fatigue Syndrome	Fatigue syndrome persists even when the drug is withdrawn.
Sexual dysfunction	Sexual problems with erectile dysfunction in men and loss of libido in both sexes does not resolve with withdrawal of the drug.
Persistent Xerosis of skin and mucous membranes and cheilitis	Persistent xerosis and severe cheilitis may last for years.

These side effects are very rare but patients must be warned about them.

Hormonal treatment

Suppression of androgen is an option for women with acne. The combination pill, containing ethinylestradiol and cyproterone acetate is used as a treatment for acne; but in my view, it is grossly overused and is only successful in about 40% of patients and has a lot of side effects. It is licenced for use in women with severe acne who are not responding to conventional treatment, but is often prescribed to women with even mild acne who want the contraceptive pill. It should only be used for 6 months, and a severe flare-up of acne is common upon its cessation. A further contraceptive pill containing drospirenone as the progesterone has some effect on acne, although it is milder than those containing cyproterone acetate. Spironolactone is a loop diuretic which also inhibits androgens. I find it very useful in women who have severe premenstrual flare, given at 100mg/day for the 7 days before their period, and also in the older woman with persistent acne, where it can be used daily.

Alternative treatments

I pioneered the use of the N-Lite laser, a pulsed dye laser with a unique waveform where scientific studies showed that it induced a massive upregulation of transforming growth factor b (TGFb). TGFb is a powerful anti-inflammatory cytokine that can also induce suppressor T cells, which can turn off immunological reactions. Clinical studies showed its efficacy in treating acne with a single treatment leading to improvement lasting up to 3 months. Many patients completely resolved after 3-4 treatments. The laser was later rebranded the Regenlite laser.

Pitfalls in acne

A big mistake in the treatment of acne is the failure to recognise macrocomedones. These are large, deep blockages in the follicle that will not respond to any medical treatment. They are a contraindication for Roaccutane use as they may precipitate an acne fulminans event. Macrocomedones may not be clinically evident, but if you stretch the skin you can easily see them. Do look for macrocomedones in any patient with persistent nodular lesions, as they are the major cause of these lesions, and may be the reason that their acne fails to respond to conventional treatments. Macrocomedones are easily dealt with; simply treat the affected area with topical EMLA anaesthetic cream, under occlusion for 30 minutes, then use a hyfrecator (at setting 3) and lightly cauterise the surface of the macrocomedone. This causes the formation of a small scab, and when this falls off, the macrocomedone is shed at the same time. Nodulocystic lesions in acne can take weeks to settle, but light infiltration with a depot steroid can lead to a fast resolution; I use Depomedrone 40mg/ml. Use a fixed needle with a diabetic syringe and infiltrate the cyst until light blanching is noticed. Using too much depot steroid can lead to significant skin atrophy.

Adjunctive treatments

2% salicylic acid washes used at night are useful in unseating comedones. Aluminium oxide facial scrubs also used at night remove the top layers of the stratum corneum and help the action of the retinoids.

30% salicylic acid peels have been shown to significantly reduce the thickness of the stratum corneum and unseat comedones. In very greasy skin, 50% pyruvic acid peels are very useful.

Acne charity

I started the first UK charity for acne sufferers in 1992 – the *Acne Support Group*, providing help and advice to patients with acne. In 1999, I stepped down as the Chairman, due to family commitments and the charity unfortunately folded a few years later.

Retiring in 2017, I decided that a new charity was needed for acne and rosacea, providing help and advice to patients, but also training for medical and aesthetic practitioners to improve the management of these diseases; thus ***Acne and Rosacea Association UK*** (**ARAUK.co.uk**) was founded.

Training is distance-based, using four webinars that we have developed describing the pathogenesis of the diseases and their modern management. Hopefully, targeting both the patients and healthcare professionals will improve the outlook of these common diseases. The course is CPD-certified for up to 40 hours, and successful participants become national charity-accredited treatment centres and pharmacy-accredited advice centres.

To download a CPD Reflective Learning Form, produced in association with the British Association of Cosmetic Nurses (BACN) & the British College of Aesthetic Medicine (BCAM), please use the QR code or visit bit.ly/CR-CPD in your web browser.