Concerns of Dermatological Acne Treatment in Singapore

John Keel February 16, 2019

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Acne Treatments In Singapore over the past years until 2019

Over the past decade, treatments for skin conditions such as acne and rosacea have not progressed much. Innovation in this field should be thriving, as acne is the single most common reason patients seek out help from a dermatologist. Unfortunately, many dermatologists continue to rely on outdated tactics like antibiotics to treat acne.

Surveys show that dermatologists in Singapore tend to prefer prescribing topical treatments because they can be specifically targeted, low dosage, and avoid the risk of antibiotic resistance, which is a major concern with oral antibiotics. This makes them safer and often more efficient than oral treatments.

Acne and rosacea are best treated with the tetracycline class of antibiotics. This anti-inflammatory drug kills Propionibacterium acnes, the bacteria that cause acne. However, developing a stable topical formula for tetracycline antibiotics has proven challenging. Other antibiotics like clindamycin and erythromycin are losing their efficacy as people develop resistance to them. This is why oral tetracycline antibiotics still play a large role in current acne treatment.
Singaporean dermatologists now have a difficult choice to make: prescribe oral tetracycline medications that are shown to be effective but carry the risk of causing antibiotic resistance or prescribe topical antibiotics that are not in the tetracycline class and are less effective due to antibiotic resistance.

**Improving Antibiotic Resistance**

Dermatologists make up less than 1% of the physicians in Singapore, but they prescribe almost 5% of the antibiotics in the country. 20% of the prescriptions dermatologists write are for antibiotics, and from 2003 to 2013, they prescribed antibiotics 8 to 9 million times each year, two-thirds of which were for acne vulgaris treatments.

There are two reasons that oral antibiotics are used so often in dermatology. One is that the best antibiotics for acne treatments (tetracycline class) are only available in oral formulas currently. The other is that topical antibiotics like clindamycin and erythromycin are less effective due to high antibiotic resistance rates.

Antibiotic resistance is a major issue and should be a top priority for any physician. In the US, studies have found antibiotic resistance rates of 100% for clindamycin and erythromycin, 97% for tetracycline, and 83% for doxycycline. The high rates of P. acnes resistance mean that treatments using these antibiotics will not be very effective, and may not result in any improvement at all. Use of antibiotics also carries the risk of killing forms of bacteria that may be useful, upsetting the balance of the body’s microbiome, and allowing other harmful bacteria to thrive. Thus, antibiotics should be used with caution and careful consideration.

There are other options for treating skin conditions other than antibiotics.

Singaporean dermatologists also use hormone therapy, isotretinoin, topical retinoids, benzoyl peroxide, and light and laser treatments. Oral antibiotics are almost always used in combination with a topical product, often benzoyl peroxide or retinoids, to decrease the likelihood of resistance and to speed up the results to avoid prolonged use of the antibiotics. According to Ubiqi Health Singapore, one of the most effective is laser treatment of acne scars and it costs around $300 per session.

**Developing Topical Antibiotic Treatments**

An effective topical method for delivering tetracycline-class antibiotics would greatly improve the dermatological treatment of acne. It could help patients avoid the negative effects of oral antibiotics, and due to the direct targeting and
low dosage, it could help reduce the risk of developing antibiotic resistance.

One reason this treatment hasn’t been developed yet is that administering antibiotics through the skin is a challenging prospect. The API (active pharmaceutical ingredient) has to penetrate and pass through the stratum corneum without irritating or triggering inflammation.

Another complication in this endeavour is the fact that tetracycline-class antibiotics are in salt form. This keeps the API stable and works very well in orally administered products that are dry, like pills or capsules. Topical solutions are often semi-solid or liquid products, and the water content tends to degrade the APIs in tetracycline-class antibiotics. To avoid degradation and stabilize the salt API, researchers tried to use an oil-based formula to minimize exposure to water. However, the antibiotics suspended in the oil are not fully solubilized or bioavailable. This means the topical solution needs to contain a higher dosage of API for transepidermal to have any effect because without solubility there is nothing to drive the active ingredients through the skin and anything that does get through will not be completely bioavailable.

Minocycline is an antibiotic that has been used in acne treatment since the 1970s, and the development of a topical delivery method for it is promising. One advantage of minocycline is that it is antibacterial and anti-inflammatory, making it a good treatment for both acne and rosacea. It also has lower rates of P. acnes resistance compared to other types of tetracycline-class antibiotics.

Other Approaches to Topical Formulas

California-based BioPharmX Inc. has developed a non-oil-based, hydrophilic gel that can solubilize minocycline fully and doesn’t leave traces of the antibiotic on the skin. BPX-01 is a solution with a minocycline concentration of 2%, and clinical trials have shown that it is well tolerated, hardly detectable in the bloodstream, and has a good safety profile. This reduces the risk of side effects and results in quick improvement in patients with non-nodular inflammatory acne vulgaris.

This new method is safe and effective, and patients will appreciate a treatment that does not come with the negative effects that are so common for most acne and rosacea treatments.

BPX-01 contains many additional ingredients, including ethanol, which allows it to easily penetrate the skin and deliver the active antibiotic ingredients. BioPharmX has designed this to be non-irritating, and the ethanol might be help reduce the risk of antibiotic resistance.
Israel-based Foamix Pharmaceuticals has developed a product called FMX101, which is also an oil-based minocycline formula in the form of a foam that leaves residue on the skin after being applied. This product does deliver minocycline through the skin and has been shown to treat acne and rosacea effectively, but it also leaves traces of minocycline on the skin and in hair follicles.

Both of these products have been shown to produce similar results to oral minocycline, but without the risk of antibiotic resistance due to the targeting ability of a topical gel or foam.

**Limited Options for Acne Therapy**

Acne treatment has not improved much in the last several years. Other than the growing concern around antibiotic resistance, it has not changed at all. The treatment options available today are much the same as they were ten years ago.

The currently available treatments all have their own limitations. Benzoyl peroxide, for example, is an irritant that causes stinging and burning in most patients, in addition to bleaching any fabric it comes in contact with. It can also cause allergic contact dermatitis, though this is rare. Topical retinoids are also irritants, especially at the beginning of treatment. This leads to poor patient compliance regarding both of these therapies. Other topical treatments, such as azelaic acid, dapsone, and salicylic acid are simply not as effective.

Non-antibiotic oral treatments like isotretinoin or hormone therapy have side effects that make them unavailable for use for male patients, despite the fact that they are effective treatments.

**Why We Need New Solutions?**

Acne vulgaris affects around 50 million people a year, making it one of the most common skin conditions in Singapore. We often see acne as a teenager’s disease, but it actually affects a significant portion of the adult population, with 37% of patients over the age of 24. 40% to 55% of adults (age 20-40) suffer from low-grade, persistent acne. According to the American Academy of Dermatology, 54% of women over the age of 25 suffer from some facial acne.

Acne is a serious issue. 20% of teenagers have physical scarring resulting from acne, and this number is even higher for people of colour. Acne can also cause dyschromia, erythema, and hyperpigmentation.

While acne isn’t a life-threatening condition, it has a serious impact on a patient’s self-esteem. Even mild acne can significantly affect a person’s self-image. 46% of acne vulgaris patients report psychiatric issues including depression, anxiety, frustration, anger, and social isolation. Acne can cause a person to disengage from social activities and avoid participating in academic and athletic events. This can lead to significant psychological damage, which leads to lasting, invisible scars in the form of depression, anxiety, and low self-esteem.

**A Superior Solution Is Needed**

Dermatologists and researchers are now on the hunt for a better treatment option that avoids the pitfalls of the currently available treatments while still remaining safe and effective. Patients need a solution that is efficacious, has good tolerability and compliance and reduces the risk of systemic side effects and antibiotic resistance. An all-in-one treatment option that reduces the need for combination therapy would be a big improvement on current care. An ideal medication would include the best of:

- No irritation of the skin
- No systemic absorption
- Fast-acting results
- High efficacy
- Minimal risk of antibiotic resistance
- Dosages suitable for once-a-day delivery
- The ability for application underneath makeup
- No bleaching or staining
- Anti-inflammatory properties
- No photosensitivity

The latest clinical trials testing new topical antibiotics have shown the potential to meet all of these standards and significantly improve the world of dermatological acne treatment.