

Acne Skin: Lifestyle or Genetic?

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“How can I cure my acne, clear its roots?!” Acne is a stubborn problem that plague about 85% of Americans [11]. Most people who have acne usually have tried tones of many products before they finally find something that can slightly reduce acne slightly. But, acne always keep break out at a certain degree and break out when people without you notice it. One after another acne just keeps breaking out. “Informercials promise to cure it, cosmetics try to conceal it, drug-store tinctures claim to clear it, home remedies aim to tame it”[3], but all have little effect.

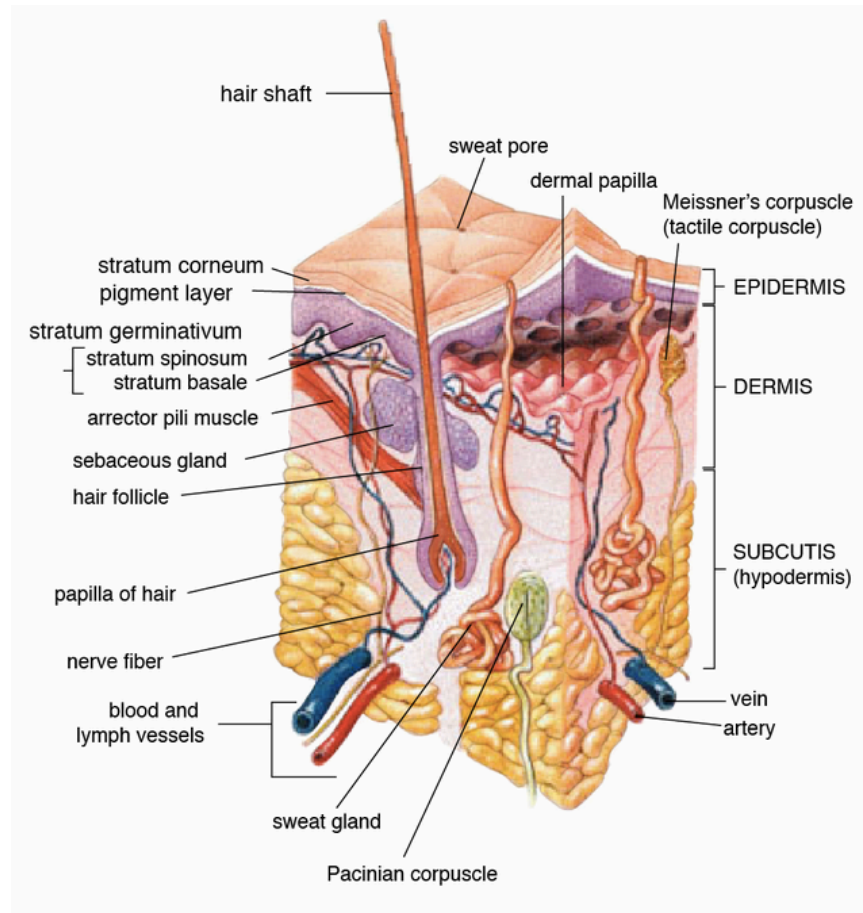
Why acne is so hard to clear, and why they keep breaking up one after another? The true answer to this question is some people are just born with scene-prone skin, which means acne is genetic. Some scientists even claim that genetic contributes to 81% of your acne problem while only 19% of the factors contribute to external or control factors such as environment [10], food, lifestyle, etc. Some people found this answer hard to accept and believe. Some might even reject to believe that acne is rooted in the genes. Before we dive into the question whether there is a cure for genetic acne problem, let's first understand a bit about the structure of the skin and the biological process of acne break out.

Skin Structure That Relate To Acne:

Skin is the biggest inflammatory system of our body; it is the first layer that bacteria attack when bacteria or any other form of virus try to attack us. Skin, contact with air, sunlight, and have to face all the conditions and substances in the outer environment, thus its priority job is to block any bacteria from ending our body. Skin is divided into three layers: epidermis, dermis, and hypodermis (figure 1). The most outer layer is the epidermis. On the most outer layer, epi-

dermis, we have hair, follicles, and sebaceous glands. The sebaceous glands, these microscopic glands in our skin, secrete sebum, which are waxy and oily substances that lubricate and waterproof the skin and hair. The largest amount of sebum is found on the skin and scalp of human. Some of the medical conditions related to sebaceous glands are acne, sebaceous cysts, hyperplasia, sebaceous adenoma and sebaceous gland carcinoma.

Sebum, the waxy and oil substance, is the metabolites of fat-producing cells, and it is composed of triglyceride oil, wax, squalene. Sebum in the sebaceous gland is produced within specialized cells and is released as result these cell bursts. The condition of greasy skin caused by excess sebum is called seborrhoea.



Skin: Sebaceous Gland/Wikimedia Common

Figure 1: This is a cross section view of the skin. The top layer is epidermis; dermis is the middle layer; and hypodermis the most inner level. Sebaceous glands are in the dermis layer.

Acne Is Strongly Genetic

There were quite a few studies related to acne and here are some of these studies:

Scientists studied 458 pairs of identical twins and 1099 pairs of fraternal twins and found that only 19% of the explanatory factors to acne is contributed to the environments, such as diet and stress, while 81% of the factors explaining the acne is due to genetics [10].

Scientists also studied 20 pair of identical and fraternal twins. They found that identical twins have exactly the same number of sebum exertion rate but different level of acne severity; while fraternal twins have different sebum production rate and different acne severity. Thus, they concluded that sebum production is controlled by genetic while acne severity is not [10].

Another group of scientists collected data of 204 acne patients and 144 non-acne patients and the acne history of their first-degree and second-degree relatives. Scientist ran the regression result and found out that having a first-degree relative with acne can indicate you have 4 times of risks of having acne compared with those do not [10].

Why and How Do We Have Acne?

So the question remain why the sebaceous gland of acne-prone people are more likely to produce more sebum and thus produce more acne. In fact, acne is an inflammatory reaction of the skin. Acne-prone skin is more sensitive skin, and thus this type of skin tend to overreact to the environment, or “overkill”, the bacteria [5]. Thus in a more bacteria-abundant or more contaminated environment, skin of the acne-prone people tend to overreact to the environment, and thus turn clean pores into pimple.

While the androgen hormone further intensifies the level of inflammatory action of the skin internally and the UV exposure from the sunlight, accelerate the speed of oxidant of skin cells, cause inflammatory resection externally.

The Types of Acne:

There are about 50 types of acne [1]. The most prevalent type is acne Vulgaris, or the common acne. Vulgari acne can be caused by many heredity factors: hormones and bacteria. Vulgari acne is characterized by open and closed comedones, papules, pustules, cyst, nodules, and scars. Comedone is usually about one millimeter in size. Open comedones are filled with blackhead and are usually caused by outer environment. Closed comedones have whiteheads, usually caused by your own body. Papules and pustules are usually bigger than comedones, about 1-5 mm in size, papules with redness and pustule with both redness and fluid inside, which are signs of inflammatory reaction of the skin [5].

Vulgari acne is divided into four grades according to its severity: first grade is some open or closed comedones with no inflammation; in second grade, skin has comedones and some pustules and papules, which look like small solid bump; third grade is papular acne, which means having both papules and pustules; the fourth grade is nodulocystic acne, which means including all forms of acne -comedones, papules, and pustule. Both third and fourth grade indicate deferent degrees of skin inflammation and inter rupture of the sebaceous glands, and they may leave scars if not carefully treated [1].

Types of Medicine Targeting Various Degrees of Acne:

The type of medicine that doctors choose to treat your acne depends on the types and grade of the acne. There are around fifty types of acne. Acne Vulgaris is the most common type. So according to the severity, acne is divided into four grades, from Grade I to Grade IV. Grade IV is the most severe grade [1] [8].

First Grade Acne is treated with Retinoid. Retinoid, a chemical compound related to Vitamin A and regulates epithelial cell growth, is used to treat the comedones, the First Grade acne [5].

Grade	Description
0	Clear skin with no inflammatory or non-inflammatory lesions
1	Almost clear; rare non-inflammatory with no more than one small inflammatory lesion
2	Mild severity; greater than Grade 1; some non-inflammatory lesions with no more than a few inflammatory lesions (papules/pustules only; no active nodulo-cystic lesions)
3	Moderate severity; greater than Grade 2; up to many non-inflammatory lesions and may have some inflammatory lesions, but no more than one active small nodular lesion
4	Severe; greater than Grade 3; up to many non-inflammatory and inflammatory lesions, but no more than a few active nodular lesions

Patent WO 2013096516 A1: Method for Treating Acne /@patentimages.storage.googleapis

Figure 2: This chart shows that dermatologists divided the severity of acne into four grades, with Grade 4 is the most severe form. Here is a clear description of each grade of acne.

Patients with both papules and pustules are categorized as Third Grade acne. Treatment for the Third Grade of acne includes Antimicrobial agent, such as clindamycin and erythromycin, and benzyl peroxide. Both Antimicrobial and benzyl peroxide act to kill the microorganism and bacteria that hide and feed by the oil and wax on the face [5] [8].

More severe acne, such as Fourth Grade acne, might need more systematic treatments, including oral antibiotics, hormonal treatment, and isotretinoin [8].

Most Effective Medical Way of Treating Acne: Isotretinoin

Except for the natural way of treating acne, which might not satisfy the effect some people what with acne, isotretinoin is another way to treat acne. Isotretinoin is the most effective way for treating acne.

Isotretinoin directly targets the sebum, which is the oily and waxy matter produced by the sebaceous glands [2] [4]. Isotretinoin reduces the sebum production, and thus prevent the anti-inflammatory reaction and reduce propionibacterium acne. Propionibacterium acne is one of the most common acne, and it is a condition associated with bacteria in the pimple feed by the oil and wax on the face[4] [7].

Isotretinoin also treats nodulocystic acne, the severe form of acne that does not respond to

antibiotics, the most common way and standard of treating acne [4].

However patients who choose isotretinoin to treat acne need to be cautious, especially for women.

Isotretinoin can not be taken when one is thinking of having a baby or is already pregnant because isotretinoin might cause teratogenic,

which means causing the abnormal genetic changes and development of babies [2].



Isotretinoin- Roaccutane /Wikimedia Common

Figure 3: Roaccutane is a type of isotretinoin. Usually high dosage of Isotretinoin is very effective on clearing acne. Patients should take according to their body weights and under doctor instruction. However, taking isotretinoin has a serious side effect, especially on pregnancy, causing abnormal development of babies.

The Only Natural Product That Can “Reduce” Acne

After reading some many biomedicine methods of treating acne that do not promise the perpetuity of killing acne completely and yet with such horrible side effects, are you interesting in learning a natural way that kills acne and keeps your skin clear?

The androgen hormone and UV exposure accelerate the intensity of acne internally and externally [6]. Green tea can help with these two factors which cause acne. Green tea can block the androgen receptors in the skin and reduce the damage those hormone do to skin. In addition, green tea acts as an anti-oxidant that fight against the accelerating oxidant process due to the exposure to UV [6].

Here is an experiment scientist tested on twenty patients by testing the effectiveness of green tea cream. Iraq scientist let these twenty patients using a 2% green tea lotion in mild-to-moderate acne vulgarism [9]. These twenty patients need to apply this green tea cream twice a day for 6 weeks. So these patients were evaluated every two weeks based on their skin conditions. The scientist determent the level of acne severity by using goal lesion count (TLC) and they devised severity index (SI) [9].



Green Tea/Wikipedia Commons

Figure 4: Green tea has many medical usages. It acts as a natural anti-oxidants for skin and thus can help skin recover from UV exposure. Moreover, green tea blocks the androgen receptor in skin and reduce the harm that hormone done to skin.

Conclusion

Fighting for acne is a long, persistent battle, which requires professional medication help, patient, persistent, and ability to resist certain lifestyle and food [3].

There are many methods to treat acne and each method has its pros and cons. Oral antibiotics can only target light to mild acne and yet is ineffective and reported by some with reoccurrence of acne growth after stop taking it. Isotretinoin is very effective yet might cause teratogenic, the generic abnormalities of babies [2]. Green tea is natural and has no side-effects yet can only be effective up to a certain degree [9]. Patients should choose the right method for themselves according to their degree of severity and types under doctors' diagnosis and instructions.

It's sad to know that up to about 81% of the recent is contributed to genes, which are more sensitive to food and environments and cause inflammatory reactions [10]. Even only 19% is within your control, but don't give up and grab this 19% of control by embracing a healthy lifestyle and carefully choose your food [10].

So the next time you get acne again, don't blame yourself too hard. After all, most of them is rooted in our gene!

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