

Factors related to the onset of acne after adolescence and traditional Chinese medicine treatment

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Abstract: Post-adolescent acne is a common type of acne characterized by a later onset age, long duration, recurrent outbreaks, and difficult-to-treat nature, often resulting in psychological issues due to scarring. The etiology and pathogenesis of this disease are unclear, and although Traditional Chinese Medicine (TCM) has its own unique characteristics and advantages in the treatment of this disease, there has not been a systematic summary of it. In this review, we systematically summarize the pathogenic factors and treatment methods related to post-adolescent acne, and aim to find better ideas and methods for TCM treatment of this disease, in order to guide clinical application.

1. Introduction

Acne, a chronic inflammatory skin disease that occurs in hair follicles and sebaceous glands, is characterized by various skin lesions such as papules, blackheads, pustules, nodules, and cysts, accompanied by oily skin [1-2]. In adolescents, the incidence rate is as high as over 80%, equivalent to the Chinese medicine terms of blackheads, facial acne, rosacea, and lung wind acne, commonly known as "youth acne" [3]. Recent studies have shown that acne can occur at any age, but mainly during adolescence. However, with increasing stress and a faster pace of life, the incidence rate of post-adolescent acne has been increasing year by year [4]. This poses a serious threat to people's physical and mental health [5]. In medicine, acne that occurs after the age of 25 is named post-adolescent acne or adult acne, with women being more susceptible than men.

2. Clinical classification of acne after puberty

Based on the age of onset, acne can be classified into two types: persistent adult acne, which emerges during adolescence and persists beyond the age of 25, and delayed adult acne, which first appears after the age of 25 [6]. Among these, persistent adult acne is the most prevalent, accounting for roughly 75% to 85% of cases. This type of acne is particularly influenced by hormonal

fluctuations, which are more pronounced before and after menstruation. Moreover, it is prone to developing drug resistance, rendering repeated use of the same medication ineffective. Late-onset adult acne, on the other hand, is relatively rare, accounting for approximately 15% to 25% of cases [7].

3. Etiology, pathogenesis, and risk factors of adult acne

In accordance with the principles of traditional Chinese medicine, the pathogenesis of this disease is primarily attributed to the presence of lung heat and gastrointestinal damp heat in the early stage, followed by the emergence of phlegm and blood stasis in the later stages.

3.1. Etiology and pathogenesis of acne

3.1.1. Lung Meridian Wind Heat

"The excess of yang heat in the body, which accumulates heat in the lungs, and the evil of wind and heat again invades the lung meridians, while the lungs merge with the skin in the body, and the heat evil evaporates on the face [8], blocking local skin, leading to stagnation of blood and heat, stagnation of qi, and blood stasis. Over time, the lung meridian wind and heat type acne develops".

3.1.2. Stomach Damp Heat

"The spleen likes dryness and detests dampness, overeating fatty, sweet, thick taste, spicy, and greasy products, which hinder the spleen and stomach from moving and transforming [9], making it difficult for the spleen and stomach to coordinate and complete the acceptance and ripening of food, causing dampness and heat in the intestines and stomach, causing long-term stagnation, heat conversion, and poisoning, and causing acne on the face" [10].

3.1.3. Phlegm dampness and stasis

Deficiency of temper and abnormal circulation lead to internal stagnation of dampness and turbidity, stagnation of heat, burning of body fluid, decoction and refining into phlegm, impeded qi flow, and stagnation of dampness, heat, and phlegm in the skin [11].

3.2. Western Medicine's Understanding of the Pathogenic Factors of Acne

The pathogenesis of acne in Western medicine is relatively clear, mainly due to the formation of inflammatory papules, nodules, or pustules caused by *Propionibacterium acnes*. During puberty, hormone secretion is vigorous and prone to disorder, which can promote excessive sebum secretion, destroy the structure of sebaceous glands, and worsen the skin condition. It is another important factor in the pathogenesis of acne [12]. In addition, this disease is closely related to endocrine, genetic, seasonal, dietary, stress, and other factors.

3.3. Risk factors for inducing acne in adults

3.3.1. Genetic Susceptibility Factors

Individuals with acne in close relatives have an increased risk of developing acne. Past case control studies have shown that individuals with acne in their first degree relatives are more than twice as likely to develop acne [13]. So the researchers speculate that the secretion of sebum may be passed on to the next generation. Other studies have found that mutations in the androgen related

CYP17 gene at 34 bases (T → C) lead to an increase in androgen levels and induce adult acne.

3.3.2. Seasonal factors

Acne generally worsens in summer and alleviates in winter, but a foreign study shows that there are obvious differences in the incidence rate of acne in different seasons. In the summer and autumn seasons, indoor and outdoor temperatures are significantly higher than in winter. Under the effect of strong ultraviolet rays, immune suppression occurs within the body, reducing the activity of Langerhans cells, and inflammation in our body will decrease. In the summer and autumn seasons, acne is alleviated instead.

This is related to differences in living habits and regional conditions in different seasons due to different countries. (Such as temperature difference, humidity, and other factors)

3.3.3. Dietary factors

There are many opinions and arguments about whether there is a relationship between the onset of acne and diet. Among them, high sugar and high fat diets are high risk factors for acne, while the mechanism of whether spicy foods induce acne is unclear.

A high sugar diet refers to the intake of foods with a high sugar index, such as cakes, candy, chocolate, desserts, and milk tea. High sugar diet not only can increase the level of androgens in the blood and induce acne, but also can increase blood sugar, causing the body to secrete insulin to lower blood sugar. The decrease in blood sugar further leads to more androgens secreted by the adrenal gland, exacerbating acne. In order to prevent low blood sugar content, it enters a cycle that requires consuming high sugar foods. Studies have found that IGF-1 (glucagon like peptide) levels in patients on a high sugar diet are significantly higher than those in normal individuals. IGF-1 can promote skin oil secretion or directly or indirectly stimulate androgen secretion through other ways to participate in the occurrence of acne.

A low sugar diet in daily life can improve acne to a certain extent. Common low sugar foods include cucumbers, tomatoes, carrots, and other fruits and vegetables. A low sugar diet is more important than the specific nutrients contained in our normal diet, such as carbohydrates or fats, in terms of their impact on acne [14]. Therefore, it is necessary to strictly control the daily sugar intake. Abstaining from sugar is not equal to being sugar free. The human body needs sugar. Compulsory complete abstinence from sugar can lead to hypoglycemia and other diseases.

High fat diet refers to the intake of foods with very high fat content: such as fatty meat, hamburgers, peanuts, and other foods with a high proportion of saturated fat content. This type of food is highly sought after by young people, but overeating can promote excessive sebum secretion. If excretion is not smooth, it can easily clog pores and form acne, further exacerbating the condition, and is not conducive to human health. Therefore, it is necessary to control the intake of foods with high fat content. Studies have found that consuming foods containing unsaturated fatty acids, such as tuna, cod, walnuts, peanuts, and flaxseed, can alleviate the patient's condition [15].

Spicy people are prone to acne on their faces, and it is commonly believed that eating spicy food can exacerbate acne. However, there is still a lack of scientific evidence to confirm whether spicy diet induces acne.

Research has found that consuming foods rich in vitamins A, E, and zinc can help alleviate acne. Eating more vegetables, fruits, various meats, and fish every day to ensure a balanced nutrition is an important way to avoid acne [14].

3.4. Stress factors

The pressure on young people in modern urban life is generally high, especially for young

women who have recently entered society. They are more likely to experience negative emotions such as nervousness and sentimentality when encountering difficulties. Compared with male acne patients after puberty, foreign researchers such as Yentzer found that adult female acne patients often feel depressed due to external stimuli such as workplace pressure and social factors, thus acne has a greater impact on the quality of life of adult women [16]. Research has shown that 42% of patients experience exacerbation of acne during periods of mental stress [17]. Acne has a significant impact on the quality of life of young people [16]. Research has shown that the hypothalamic CRH (corticotropin releasing hormone) skin axis may be the mechanism by which psychological factors exacerbate acne.

3.5. External factors

For a long time, people have overlooked that exogenous factors can also lead to the occurrence of acne. Using cosmetic products to mask acne is an important coping strategy for adult female acne patients, such as cosmetics. However, data shows that 62% of adult women experience clogged pores and poor oil secretion due to long-term use of cosmetics, which can lead to acne or worsen the condition. Research has found that certain mineral oils and heavy metal substances contained in cosmetics can also induce the occurrence of acne. There is still controversy over whether cosmetics cause acne, and acne has not been cured by discontinuing the use of cosmetics. The important way to avoid acne is to use skincare products that are suitable for oneself.

Foreign studies have found that smoking is also the main cause of female acne [18]. In addition, frequent exposure to air pollutants and some harmful substances due to work reasons can also lead to acne through other channels.

3.6. Endogenous factors

Acne caused by prolonged constipation due to staying up late, changes in sexual hormones, or dietary reasons is an endogenous factor. In addition, surveys have shown that adult acne is also closely related to endocrine diseases. Some endocrine diseases induce acne by causing elevated androgen levels or insulin resistance, such as polycystic ovary syndrome, androgen secreting tumors, and HAIR-AN syndrome.

3.7. Other factors

Previous studies have shown that there is a special relationship between the occurrence of acne and the level of economic and social development. For example, in countries with a high level of development, it can be clearly found that the incidence rate of acne is high, while in some countries and regions with relatively slow or stagnant development, the incidence rate of acne has declined to a large extent. An experimental team has investigated various countries and found that there are almost no acne patients in non-modern countries such as Paraguay. There are some controversies that this is the cause of human race, but according to relevant surveys, the incidence rate of acne among Paraguayan residents living in some developed countries is significantly higher than that in the original countries, which confirms that the incidence of acne is closely related to people's living conditions.

4. Treatment

There are many factors that can lead to acne after puberty, and single traditional Chinese medicine treatment or Western medicine treatment is difficult to achieve satisfactory results, each

with its own advantages.

4.1. Western Medicine's Treatment of Postpubertal Acne

The treatment of this disease in Western medicine is often based on the use of local medication, and appropriate plans are selected according to the different situations of the patients [12]. Adapalene or retinoic acid cream is the most common topical drug for the treatment of adult acne.

According to the condition of acne, it can be divided into three categories: mild, moderate, and severe. Mild acne usually has mild inflammation. Erythromycin ointment or adapalene gel can be applied locally [19]; When the moderate inflammatory response is obvious, local medication should be combined with oral antibiotics for treatment; In addition to basic medication, severe acne can be treated in combination with dot matrix laser or fire needle therapy. Western medicine treatment has a quick effect, but it does not cure the symptoms, the condition is prone to recurrence, and the side effects are large. Drug dependence is strong, and combined with traditional Chinese medicine treatment is better. The advantages of using traditional Chinese medicine to treat acne lie in its emphasis on treating the root cause, emphasizing conditioning, and minimizing side effects. This article focuses on the traditional Chinese medicine treatment of acne after adolescence.

4.2. Traditional Chinese Medicine for the Treatment of Postpubertal Acne

In clinical treatment, there is no significant difference in the treatment methods for post-adolescent acne patients and other types of acne patients. However, due to the diverse causes of adult acne, it is more prone to characteristics such as worsening before menstruation, stubborn and difficult to treat, and repeated delays. It is generally necessary to comprehensively analyze the severity of the disease, the location of the disease, and the patient's own reasons before developing a personalized plan.

4.2.1. Liver and Kidney Yin Deficiency Syndrome

Traditional Chinese medicine has a long understanding of this disease, which can be seen in the description of the "Authentic Surgery". After referring to a large number of literature, it is not difficult to find that ancient doctors have similar views on the etiology and pathogenesis of acne. Most doctors believe that the fundamental cause of acne after puberty is the deficiency of liver and kidney yin in the human body. The liver is responsible for relieving stress, preferring to regulate the flow of qi while detesting depression, causing stagnation of liver qi and further invading the spleen and stomach, leading to weakness of the spleen and stomach. Phlegm and dampness are endogenous, and prolonged stagnation generates heat. Dampness and heat can block the hair orifices and induce this disease; Due to the stagnation of qi and the transformation of fire, it can damage the kidney yin over time. The liver and kidney are of the same origin, directly leading to the deficiency of liver and kidney yin. Steaming the face with deficiency fire can also lead to the occurrence of acne. It is easy to understand the occurrence of acne when the body is in a state of yin and yang imbalance for a long time. Therefore, acne patients often worsen their condition due to poor emotional state after puberty [20].

In female patients, we can find some special relationships with the menstrual cycle, such as the aggravation of skin rashes on the patient's body surface before the physiological cycle, and significant improvement in the patient's skin after the end of the physiological cycle. At this stage, women are often in a state of "insufficient yin and surplus yang". At the same time, after puberty, the yin of the liver and kidney in women gradually decreases, and the impulses and responsibilities are not adjusted. It is common to see irritability and poor qi stagnation. These symptoms effectively

prove that the root cause of acne as mentioned earlier is liver and kidney yin deficiency.

For the syndrome of liver and kidney yin deficiency, one can choose Zhibai Dihuang Tang, which can clear heat and nourish the yin of the liver and kidney. Research has confirmed that it can maintain sexual hormones within normal levels and also have an anti-inflammatory effect. Pingcuoyin is an addition or subtraction of Zhibai Dihuang Tang, which has a similar mechanism to Zhibai Dihuang Tang and can reduce androgen levels.

4.2.2. Wind heat attacking lung syndrome

It can be seen that the patient's face is red, sweating is not smooth, acne is dense and accompanied by pain, dry stools are severe, constipation, short and red urine, red tongue and yellow fur, and smooth pulse [2]. Treatment principle: expelling wind and clearing the lungs. Prescription selection: Modified Pipa Qingfei Yin [21]. Research has found that Pipa Qingfei Yin has a significant therapeutic effect on adult acne with lung meridian wind heat syndrome, and there are no significant side effects [22].

4.2.3. Gastrointestinal dampness heat syndrome

The patient has bad breath, loose stools, and a sour and foul taste. In severe heat, they may experience constipation and yellow urine; Most of them are oily skin, which can be seen on the face, chest, and back with dense redness and swelling. This changes in intensity and is difficult to heal over time. The tongue is red, the fur is yellow and greasy, and the pulse is smooth [21]. Treatment principle: Clearing heat, removing dampness, and detoxifying. Prescription Selection: Longdan Xiegan Tang Modified [23].

4.2.4. Phlegm dampness and stasis syndrome

The patient's face can be seen to be dull and lack luster, with a dark red rash color. The skin lesions are mainly nodules, abscesses, cysts, and scars, which are difficult to heal over time [24]. The fur is yellow and greasy, and the pulse is smooth. Treatment principle: dehumidifying and resolving phlegm, promoting blood circulation and dispersing nodules. Prescription selection: Er Chen Tang combined with Tao Hong Si Wu Tang with modifications [25].

4.2.5. Syndrome of Chongren imbalance

Only seen in female patients, acne worsens before menstruation and alleviates after menstruation, and most patients are accompanied by dysmenorrhea and irregular menstruation. The rash is red in color, often seen on the forehead and face, with uneven skin. Medication is usually taken warm after the end of the menstrual period. Due to the cold nature of the medication, menstrual medication can worsen dysmenorrhea, Treatment principle: Regulating Chongren, detoxifying and dehumidifying, selecting formula: Tiaochong Qingre Tang, research has found that this formula can increase estrogen levels. Female patients should not solely use antipyretic drugs when taking medication, as their innate constitution is yin. For female patients with cold uterus and cold hands and feet all year round, a small amount of traditional Chinese medicine with a warm and soothing nature, such as motherwort, should be added.

4.3. Supplementary Dietary Therapy

Choosing foods with the main functions of clearing heat, dehumidifying, anti-inflammatory, and reducing fire as auxiliary treatments, such as red bean barley seed soup, mung bean vegetable drink, etc., is easily accepted by the public due to its no side effects.

5. Summary and Outlook

In summary, the pathogenic factors of acne after puberty include multiple factors such as genetics, season, stress, endogenous, exogenous, and living conditions. Western medicine treatment is prone to drug resistance, recurrence, and difficult to cure. Additionally, due to poor patient compliance, treatment is more challenging. Traditional Chinese medicine has certain advantages and characteristics in treating this disease. With the dynamic changes of the condition, personalized treatment can be tailored to individuals. However, the treatment cycle is long and patients need to adhere to long-term medication, which can easily lead to patients giving up treatment on their own. With the continuous exploration and research of this disease, its treatment methods are diverse and flexible. Currently, it is believed that the fundamental goal is to combine traditional Chinese and Western medicine with the treatment of both symptoms and signs, and the core method is to differentiate symptoms and treat according to the case. While using local topical drugs, traditional Chinese medicine internally regulates the body's yin and yang, making yin and yang secretive, and then combines emotional regulation, relieving liver depression, cultivating a good lifestyle and dietary habits for comprehensive treatment, thus achieving satisfactory therapeutic effects. At present, the etiology and pathogenesis of this disease have not been fully elucidated, and further exploration and research are needed. Therefore, we hope to continuously optimize treatment plans in future treatments, reduce the pain of more patients as much as possible, bring better therapeutic effects to patients, and also promote traditional Chinese medicine.

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