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To evaluate the causes and possible treatments for alopecia seborrheic in adolescents

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Abstract:

The incidence of seborrheic alopecia (androgenetic alopecia) among teenagers is increasing year by year and shows a trend of younger age. This study reveals three main pathogenic mechanisms: Elevated androgen levels (e.g., dihydrotestosterone) lead to the miniaturization of hair follicles; psychological stress aggravates hair loss through the neuroendocrine pathway; and poor lifestyle habits (e.g., sleep deprivation, high-sugar diets) and improper hair care exacerbate the condition. In terms of treatment strategies, the research suggests: In terms of drug treatment, it is recommended to use 2% minoxidil foaming agent to reduce the risk of allergy, and to use oral anti-androgen drugs that may affect development with caution; Traditional Chinese medicine treatment may include ketoconazole external washing combined with acupuncture. At the same time, it emphasizes the comprehensive management of lifestyle adjustments (regular rest and balanced nutrition) and psychological intervention (cognitive behavioral therapy). This study provides evidence-based evidence for the prevention and treatment of seborrheic alopecia in the special population of adolescents, and points out that more clinical studies for adolescents need to be carried out in the future to optimize the treatment plan and fill the research gap in this field.

Keywords: Seborrheic alopecia, Teenagers, Hair loss, Pressure, Minoxidil, Integrated treatment of traditional Chinese and Western medicine

1. Introduction

Hair loss is a concern for many teenagers. According to the literature, hair loss is a growing problem among teenagers, hair loss can be divided into several specific types, such as telogen effluvium, seborrheic alopecia, and postpartum alopecia (Hong, 2023). Among them, the seborrheic alopecia is the most common (ibid.). Seborrheic alopecia, also known as androgenetic alopecia (AGA), is characterized by

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progressive and slow follicular miniaturization due to the excessive sensitivity of hair follicles to male hormones (Zhang, 2014). Based on age and family history, patients experience progressive hair thinning and softening beginning during or after puberty, eventually leading to hair loss. In recent years, the onset age of AGA has shown a trend of getting younger, and the prevalence gradually increases with age (Zhang et al., 2022). TOSTI (2005) conducted a series of studies on 20 prepubertal children, and the results showed that all male and female children presented with female - type AGA. Also, during puberty, seborrheic alopecia usually presents as progressive softening of the hair, thinning of the diameter, and reduction in density, eventually leading to alopecia of varying degrees.

Severe seborrheic alopecia not only affects appearance but also causes psychological distress and interpersonal difficulties for teenagers. Since people usually believe that only “pain and illness” belong to diseases, and hair loss is not painful, so it has not received widespread attention. Also, the causes of seborrheic alopecia are numerous, and pathological hair loss problems are worth noticing and studying. In addition, since there are few studies on adolescent seborrheic alopecia, studying this topic can fill a certain research gap, which is innovative. At the same time, proposing suggestions on dealing with teenagers’ seborrheic alopecia can not only improve the quality of life of teenagers, preventing the deterioration of psychological and social problems caused by hair loss, but also promote medical progress and open up new ideas for the treatment of hair loss.

Against this background, this dissertation aims to popularize the scientific knowledge about seborrheic alopecia, analyze the current situation and causes of seborrheic alopecia among teenagers, evaluate the feasibility of existing clinical treatment plans, so as to put forward reasonable suggestions for improvement and treatment for teenagers troubled by seborrheic alopecia.

2. Literature Review

Seborrheic alopecia, a condition characterized by excessive sebum production, scalp inflammation, and progressive hair thinning, has been extensively studied in adult populations, but its manifestation and management in adolescents remain under-researched. This literature review investigates the existing knowledge on the pathophysiology of seborrheic alopecia, explores its unique implications for adolescents, and identifies critical gaps in current research to demonstrate the need for the studies in this age group.

2.1 Discussions about seborrheic alopecia

Current literature shows that many scholars focus on the pathophysiology and treatment of seborrheic alopecia, though research primarily targets adults. The pathogenesis of seborrheic alopecia is multiple, with hormonal dysregulation, genetic predisposition, and microbial interactions playing central roles. As (Zhong et al., 2018) . Their genetic analysis of adults with seborrheic alopecia revealed polymorphisms in the androgen receptor (AR) gene, this finding underscores the potential utility of anti-androgenic therapies, such as finasteride, which inhibits 5α-reductase. However, the applicability of such treatments to adolescents is complicated by ongoing puberty-related hormonal fluctuations, a point later emphasized by (Zhang, 2022).

Pharmacological interventions, such as topical minoxidil (5%) and oral finasteride, are central to current treatment guidelines. For example, Liu (et al. 2024) screened suitable prescriptions through in vitro penetration experiments and established an animal model of androgenic alopecia for prescription evaluation. Within 180 days, finasteride inhibited the effect of testosterone propionate on hair follicle miniaturization, and the synergistic effect of minoxidil on hair growth confirmed the
inhibition of androgenic alopecia by the compound. However, these results cannot be applied to adolescents due to the potential risk of hormonal disturbances during adolescence (Zhang et al., 2022). Non-pharmacological approaches, such as low-level laser therapy (LLLT), have also garnered significant attention. He (et al. 2022) noted that LLLT regulates inflammatory cytokines (such as IL-6 and TNF-α) in adult patients, which can effectively regulate skin barrier function. This non-invasive approach may hold promise for adolescents, but age-specific efficacy data are lacking. In general, the combination of Western medicine, traditional Chinese medicine and modern physical therapy in the treatment of dermatitis can improve the efficacy, and for adolescents, perhaps the use of non-pharmacological methods will be more appropriate, which needs to be further confirmed by experiments.

2.2 Discussions about Seborrheic alopecia in adolescents

In this section, the paper selects and reviews articles related to adolescent seborrheic alopecia, including causes, effects, and possible treatments, with the aim of illustrating the current state of the true literature on the topic and attempting to identify research gaps. First, Zhang (et al., 2022) conducted a cross-sectional study on two adolescents (males aged 14 and 15). Wang (et al., 2021) found that the prevalence of seborrheic alopecia among adolescents in China was about 6.0% for girls and 21.3% for boys. Earlier puberty (before age 12) was strongly associated with disease severity. The authors speculate that the rapid increase in DHT during adolescence may accelerate the sensitivity of an individual’s scalp. This result is the

same as Min's study (2024), however Min stresses that since adolescents tend to show different patterns of hair loss than adults, age-adjusted diagnostic criteria are needed. This reflects the particularity of young people.

The effect of seborrheic alopecia on adolescents is also a topic of heated discussion among scholars, which may be because teenagers are relatively immature and their psychological feelings and health are easily affected. First, the psychological effects are particularly pronounced in this age group. Zhang (et al., 2022) survey showed that the adverse effects of seborrheic alopecia could easily lead to mental health problems such as low self-esteem, autism, anxiety, etc., and thus affect the physical and mental health of adolescents. Notably, 40 percent of them showed depression, with girls more affected than boys (Wang et al., 2021). These findings suggest the need to incorporatepsychological support into treatment regimens when dealing with adolescent cases, which further inspires this paper to consider psychotherapy and therapy in later discussions.

As for possible treatments, lifestyle factors can exacerbate the condition. Min (2024) analyzed the eating patterns of adolescent patients and linked high-glycemic index diets (such as frequent consumption of sugary snacks and processed foods) to increased sebum production and inflammation. This means that in this context, the scholar proposed a mechanism to adjust the diet as a preventive strategy, eat more light and easy to digest, warm the spleen and stomach, rich in collagen and heat clearing and detoxification of food, can effectively clear the body damp and heat,
regulate themselves.

Moreover, alopecia seborrhoeica can also be improved from the aspects of living habits. Such as personal hygiene and avoidance of irritation. Keeping the scalp clean is the basic step to prevent and treat seborrheic dermatitis, and teenagers should develop the habit of cleaning the scalp every day, especially after exercise or sweating a lot. However, hair loss patients need to choose the right shampoo, a reliable brand, to use comfortable, careful use, do not cause redness, itching, irritation of the product. In fact, there is no real anti-shampoo on the market. Therefore, when choosing shampoo, the main consideration should be their own needs, or the needs of the scalp (Lin, 2022).

2.3 Contributions and limitations of existing literature

The current study provides a fundamental understanding of the mechanisms and adult treatment of seborrheic alopecia. Zhu(et al., 2020) identified the prevalence of seborrheic alopecia in adolescents and investigated adolescent-specific pathways. The clinical trials reviewed by Zhang (et al., 2022) provide a blueprint for treatment. Data on lifestyle factors, mental health issues (Zhang et al., 2022) and Dr. Zhang (Appendix3) further enrich the management framework.

However, significant gaps hinder progress in adolescent care. First, most pharmacological trials exclude volunteers under the age of 18, leaving clinicians to rely on adult data. For example, the long-term effects of minoxidil on adolescent scalp physiology remain unstudied. In addition, while the psychological burden is welldocumented, mental health interventions like cognitive behavioral therapy have not been evaluated in this population. Finally, prevention strategies, such as dietary
modification, lack clinical practice and validation.

In summary, the reviewed literature indicates that seborrheic alopecia is a multifactorial disorder that uniquely affects adolescents, but there are still major gaps in understanding age-specific pathological mechanisms and optimizing treatment. Future research must prioritize studies in adolescents to evaluate treatment safety, explore psychological interventions, and validate prevention approaches. By addressing these gaps, the proposed study aims to analyze the causes of adolescent seborrheic alopecia, then evaluate the effectiveness and results of existing treatment methods, and finally give reasonable treatment methods for adolescents.

3. Methodology

This paper comprehensively examines the etiology and potential treatments of adolescent seborrheic alopecia to provide valuable references and suggestions. In this context, this paper selects the literature research and interview of the research method, uses secondary data to establish the background and theoretical framework, and then uses primary data to provide specific empirical support, or supplements it with primary research when secondary data is found to be insufficient.

In terms of literature research, this paper searched a large number of professional literature papers and data related to seborrheic alopecia and adolescent groups, covering dermatology, endocrinology, genetics and other fields. All literatures are from authoritative platforms and have high authority. Among them, EPQ provides Academic library, which has a wealth of paper and digital academic resources. As a key project of China's national knowledge infrastructure construction project, CNKI is the world's largest continuously updated Chinese academic literature database. Wanfang is a large-scale comprehensive information resource platform developed by Wanfang Data Company, with a large number of academic journals, theses and other literature resources.

For interviews, this study aims to obtain firsthand professional insights from experts. Therefore, the interviewees

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include experts and scholars on linked in, dermatologists, traditional Chinese medicine practitioners, and experts in related fields. The interview questions mainly focus on the symptom manifestations of seborrheic alopecia, the impact of teenagers' living habits on hair loss, the experience and effect during the treatment process, and suitable treatments recommended for teenagers. Through communication with these professionals and patients, this research can have a deeper understanding of the actual situation of seborrheic alopecia in adolescents and provide vivid and practical cases and viewpoints for the research.

4. Result and discussion

Based on literature and interview data, this part will first analyze the core causes of adolescent seborrheic alopecia, and then propose targeted treatment strategies from the dual dimensions of medical intervention and psychological support.

4.1 Evaluation of causes

Literature reviews and interviews indicate that adolescent seborrheic alopecia stems from three factors: hormonal fluctuations during puberty, psychological stress and behavioral patterns, and improper hair care practices.

First of all, the paper suggests that hormone levels fluctuate during adolescence, which can lead to seborrheic alopecia. During puberty, a particular stage of growth, the body's hormone levels will show more pronounced fluctuations. Through in-depth interviews, Dr. Zhao (Appendix2) clearly explained that in adolescent males, hormones in the body, such as dihydrotestosterone, which plays an important role in male hormone metabolism, will increase secretion, and this change breaks the original balance of the endocrine system, and eventually leads to endocrine disorders. Once the endocrine disorder occurs, it will have a strong and direct stimulating effect on the sebaceous glands, so that the function of the sebaceous glands is flooding, and eventually lead to increased scalp oil secretion, beyond the normal level. Excess oil and debris accumulate, clogging hair follicles and impairing nutrient delivery and oxygenation, ultimately leading to follicular atrophy. Over time, the quality of the hair follicles decreases, resulting in seborrheic alopecia.

Abnormal metabolism of male hormone in adolescence is also a kind of hormone level disorder. Dr. Zhao (Appendix2) pointed out that the secretion of dihydrotestosterone (DHT) in adolescent males increased by 2.3 to 3.1 times compared with pre-development ($P<0.01$), and this drastic change disrupted the dynamic balance of the endocrine system. Overactivation of the key enzyme 5α-reductase leads to abnormal conversion of testosterone to DHT, while the expression level of the hair follicle unit androgen receptor (AR) is synchronously upregulated by 42% (Chen et al., 2013). This metabolic disorder will change hormone homeostasis and increase the probability of seborrheic alopecia in adolescents. Dr. Zhang (Appendix3) emphasized that there are special characteristics of the adolescent group, and the academic pressure in adolescence will lead to increased cortisol levels, which will interact with sex hormones and amplify the secretion of DHT. According to the clinical observation of Wei (et al., 2011), when the serum DHT concentration exceeded the standard, the volume of sebaceous glands expanded by 37%, and the secretion activity increased to 1.8 times the normal level. The oversecreted lipid mixture forms a dense cork in the funnel of the hair follicle, causing the unit oxygen partial pressure of the hair follicle to drop to 6.5mmHg (normal 12-15 MMHG). This chronic hypoxia state reduces the proliferation rate of hair follicle stem cells by 60%, and the hair diameter gradually shrinks to fine (<0.03mm), leading to seborrheic alopecia.

Secondly, behavioral patterns and psychological stress may also lead to adolescent seborrheic alopecia. In terms of behavior pattern, daily life factors are a major factor affecting seborrheic alopecia. According to the clinical experience of Dr. Zhao (Appendix2), many adolescent patients with seborrheic alopecia often have the bad habit of staying up late for a long time. For example, teenagers are often addicted to electronic devices or sleep late in order to complete various study tasks, seriously disrupting the normal schedule. In the research report of Qiao (et al., 2020), it is explained that the trend of teenagers staying up late is aggravated, on the one hand, leading to kidney atraxia and hair loss of kidney deficiency; on the other hand, the rhythm of biology is broken, and endocrine disorders lead to seborrheic alopecia. An interview with Dr. Zhao (Appendix2) confirmed this view. In addition, the degree of fatigue is also one of the behavioral patterns, fatigue disorders are mainly reflected in the lack of exercise, sitting for a long time, etc. Nowadays, teenagers generally lack of exercise, resulting in an increase in obesity, causing endocrine disorders, so that the body is in the sub-health window, the system is damaged, resulting in seborrheic alopecia. (Qiao et al., 2020)

Not only that, but diet is also a major factor in the development of adolescentseborrheic alopecia, which is strongly associated with diets high in sugar and fat (Qiao et al., 2020). Dr. Zhao (Appendix2) said in an interview that some adolescent patients with seborrheic alopecia have unbalanced diets and like to eat fried, high-fat, spicy and other irritating foods. Wei (2025) believed that excessive intake of refined carbohydrates and saturated fatty acids, such as choosing foods high in sugar and fat, can activate mTORC1 signaling pathway, promote sebaceous glands to secrete oil, aggravate scalp inflammation, form hair fol-

licle horn plug, and form seborrheic alopecia.

In addition, in terms of psychological stress, Dr. Zhang (Appendix 3) sated that many adolescents also face intense academic pressure such as gaokao, homework, frequent exams, various activities, and expectations from parents and teachers, which put great stress on their bodies and minds. Furthermore, Lee (et al., 2019) noticed that anxiety, depression, obsessive-compulsive disorder in the high incidence of puberty, easy to be complicated with hair loss. Long-term mental stress can affect the normal growth cycle of hair, so that hair enters the resting period prematurely. When the amount of hair in the resting period increases, the new hair will gradually decrease, resulting in seborrheic alopecia (Chen et al., 2013).

Finally, in this paper, it is suggested that the unsuitable hair care behavior is a key factor causing seborrheic alopecia in some adolescent groups. As Dr. Zhao (Appendix2) points out, improper daily care behaviors in adolescents, such as frequent use of strong degreasing shampoos containing sulfates, and long-term tight hair tying, can damage scalp health. Frequent use of this kind of shampoo will damage the scalp barrier, and the scalp's originally stable oil-water balance will be broken. If the scalp loses its normal ability to regulate oil, hair follicles will gradually atrophy due to the lack of a suitable nourishing environment, and the growth foundation of hair is weakened, resulting in seborrheic alopecia.

From a professional point of view, pH imbalance is one of the important mechanisms leading to hair loss. A healthy scalp is in a slightly acidic environment with a pH of 4.5-5.5, which provides ideal living conditions for the scalp and hair follicles. However, sulfate shampoos have a pH of 8.0-9.5 and are alkaline. When this type of shampoo is frequently applied to the scalp, the acid-base environment of the scalp is changed. According to the research results (Li et al. 2020), this alkaline environment will promote the proliferation of pathogenic bacteria such as Staphylococcus aureus, and the risk of scalp infection will increase by 3.2 times. Under the dual effects of infection and acid-base imbalance, scalp health deteriorates, and eventually seborrheic deactivation occurs.

In addition, the study (Min, 2024) also pointed out that excessive cleaning can also destroy scalp ecology. In order to keep their hair fresh, many teenagers wash their hair frequently or use strong cleaning products, which temporarily removes oil, but alsodestroys the scalp surface barrier and scalp ecological imbalance. In response to this imbalance, the scalp will secrete more oil, which in turn will make teenagers increase cleaning efforts, forming a vicious cycle that makes seborrheic alopecia serious.

4.2 Possible suggestions and treatments

After analysing specific causes of adolescent seborrheic alopecia, this dissertation further proposes possible suggestions and treatments to deal with this issue, in which adolescent's features and psychological cares are also taken into consideration.

To begin with, this paper believes that early intervention is necessary and important. According to Dr. Zhao (Appendix2), the current number of people with seborrheic alopecia is showing a trend of continuous growth, and it is particularly noteworthy that the group is becoming younger. With rich clinical experience, Dr. Zhao(Appendix2) pointed out that many parents are full of surprise and confusion when they take their children to the hospital. It was hard for them to understand why their child had hair loss at such a young age. In their traditional perception, hair loss seems to be a problem that people tend to suffer after middle age. However, this concept is a misconception, hair loss is not divided according to age. As mentioned before, with the progress of technology development, the pressure of study and life faced by teenagers has become more important than in the past, and the increase of this pressure has affected the physical function of teenagers to a certain extent, thus increasing the possibility of seborrheic alopecia.

Therefore, in order to effectively prevent the occurrence of adolescent seborrheic alopecia, it is necessary for teenagers to understand the pathological knowledge of hair loss. Teenagers can test their risk by using a pull test (Zhao, Appendix2), in which they gently pinch about 50 hairs from the root of the hair with their thumb, index finger and middle finger, and gently pull in the direction of the hair. If more than six hairs are lost during this light pulling process, it indicates a relatively high risk of hair loss (ibid.). If a high incidence is detected, adolescents may choose to undergo some preventive treatment, for example, use low-concentration minoxidil, or use a professional laser comb at the beauty salon to improve the hair growth environment (Hu et al., 2019).

Second, in the field of treatment of seborrheic alopecia, western medicine has become a very common and important treatment in clinical practice. Reasonable use of Western medicine can not only effectively control the symptoms of hair loss, but also promote the re-growth of hair. According to a paper written by Zhang (et al. 2022), western medicine is the most common treatment for seborrheic alopecia. It is divided into topical drugs and oral drugs. The most common topical drug is minoxidil, which is very universal, and this information has been obtained in the collected secondary literature and expert interviews. Minoxidil is a drug that increases the flow of hair follicles by opening potassium channels and prolongs the growth cycle of hair (Petzoldt et al., 2007). However, according to the research and test results of Zhao(et al., 2024) Minoxidil is different for adults and adolescents in terms of use,

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and when compared with foam, foam does not contain propylene glycol and is not easy to cause skin allergy and irritation, so the method of foam is more recommended in this dissertation. In the experiment of Zhang (et al., 2022), 7 out of 44 cases had adverse reactions such as allergy, scalp irritation, dizziness, and the symptoms disappeared after stopping the drug. Therefore, 5% minoxidil foam reduces local reactions such as itching compared to 2% minoxidil solution, so the foam preparation may be more suitable for children and adolescents, and it is recommended to use a 2% concentration solution of 1ml twice daily (Zhang et al., 2022).

In addition, according to Zhang (et al., 2020), oral finasteride has been widely used in the treatment of seborrheic alopecia in countries around the world, and is by far the main means of non-surgical treatment. The mechanism of oral finasteride is explained by the current scholars. For example, Zhang (et al., 2022) explained that seborrheic alopecia belongs to androgen related diseases, and the dehydrotestosterone produced by testosterone metabolism binds to hair follicle receptors to miniaturize hair follicles, resulting in hair thinning. Finasteride can block this process and play a therapeutic role. However, this treatment still has some limitations. Even though finasteride can reduce serum DHT by 60% to 70%, but may affect the development of puberty, so patients under 18 years of age should be cautious.

Third, besides western methods, this dissertation also propose Traditional Chinesemedicine as the third suitable treatment for adolescents. For thousands of years, traditional Chinese medicine has fully demonstrated its superiority in the treatment of hair loss. It can be concluded from the interview (Appendix 2) and the data collected by He(2021) that external treatment of traditional Chinese medicine has obtained extensive clinical application and accumulated a lot of clinical experience. Traditional Chinese medicine therapy is also divided into internal administration and acupuncture or moxibustion two aspects. First of all, traditional Chinese medicine for external use of the classic prescriptions are ketoconazole and tincture. Huang (et al., 2019) tested patients with seborrheic alopecia and found that the hair root had the highest colonization rate of Malazzia, and ketoconazole was the preferred topical drug for superficial fungal infection of the skin, and the local application of ketoconazole had a good clinical effect on Malazza-related diseases. Also, tincture is another external dosage form of Chinese medicine. By soaking Chinese medicine in ethanol, effective ingredients can be extracted more effectively, and meanwhile ethanol can dissolve sebum and improve the greasy scalp of patients. In addition, in the paper of Zeng (et al., 2022), it was pointed out that some experts and scholars made their own shampoo with Phellodendron, snake bed, wild chrysanthemum and other ingredients, or beat polythum multiflorum, transparent grass, safflower and other ingredients into powder, and used steam to fumigate the scalp. The results show that this treatment can effectively reduce scalp inflammation.

In addition, acupuncture can also be used in the traditional Chinese acupuncturetreatment (Gao et al., 2019). This is a combination of local acupuncture, body acupuncture, moxibustion and acupuncture point burying, usually using acupuncture points near the head such as hair points. Acupuncture in the area of hair loss can increase blood flow and improve the absorption rate of drugs on the scalp. According to Zeng (et al., 2022), the transdermal technology of microneedles has received widespread attention in recent years, and this new type of therapy is also applied in clinical practice. The mechanism of action of TCM needle rolling, plum flower needle and microneedle is similar, and they all stimulate the regeneration of hair follicles in the hair loss area and increase the permeability of drugs. As He (2021) proved, the efficacy of finasteride and plum acupuncture in the hair loss area after 12 weeks of treatment is obvious. It is found that the anxiety state and hair loss of patients were improved, and the effect of Chinese medicine treatment group was faster, which is similar to the research results of Wang (et al., 2023). This commonality further demonstrates the effectiveness of acupuncture in traditional Chinese medicine treatment. However, the causes of seborrheic alopecia involve many factors, the depth and frequency of acupuncture cannot be guaranteed to be uniform, and the sample size of clinical studies on the specific mechanism of acupuncture in the treatment of alopecia is small, lacking sufficient data support (Wang et al., 2016). Therefore, in order to improve the curative effect, this dissertation believes that it is possible to combine TCM acupuncture treatment with Western first-line treatment.

Finally, lifestyle management is also one of the treatments for seborrheic alopecia.This dissertation will explain from four aspects: diet, rest, cleanliness and stress. In terms of diet, it is recommended that adolescents eat foods rich in protein (such as fish, eggs, soy products) and vitamins (such as vitamins A, B6, B group) to support hair growth and scalp barrier function. For example, vitamin A maintains healthy epithelial cells (e.g., carrots, spinach), while vitamin B6 (e.g., potatoes, herring) helps regulate lipid metabolism. In addition, it is necessary to limit the intake of spicy, greasy food and alcohol to reduce the stimulation of sebaceous glands.

In addition, staying up late for a long time can disrupt the endocrine system, leading to increased levels of androgens such as dihydrotestosterone, which further stimulates sebum production and shortens the hair growth period. adolescents should ensure at least 7 hours of sleep per day

and fall asleep no later than 23:00 to maintain the normal regularity of melatonin and cortisol, thereby reducing the risk of hormonal imbalance leading to hair loss (Wei, 2025; Qiao et al., 2020). Moreover, young people with seborrheic alopecia need to improve their daily scalp cleaning and scientific scalp care. The experimental results of Huang (et al., 2019) showed that the use of ph5.5 weakly acidic amino acid shampoo could effectively improve seborrheic alopecia, which was also confirmed (Choi et al., 2019).

Finally, it is also necessary to pay attention to the psychological counseling of minor patients and relevant medical knowledge popularization, so as to minimize the adverse impact of the disease on the psychological development and health of patients.(Zhang et al., 2022). Many patients with seborrheic alopecia are more prone to mood disorders such as appearance anxiety, which is confirmed by the literature I interviewed by Dr. Zhang (Appendix 3) and Zhu (et al., 2020). According to the survey conducted by Wei (2025), adolescents are advised to relieve stress through exercise, meditation or artistic activities and seek psychological counseling if necessary to improve anxiety. According to the resolution therapy provided by Dr. Zhang (Appendix 3), weekly CBT through Cognitive Behavioral therapy (CBT) can effectively reduce the probability of depression in patients. CBT is a form of psychotherapy based on empirical research that aims to alleviate psychological problems by changing an individual's negative thought patterns and bad behavior. The idea is that cognition, emotion, and behavior interact, and tweaking one can lead to overall change. Cognitive behavioral therapy (CBT), with its scientific and effective characteristics, has become a mainstream psychotherapy method to help individuals develop healthier mental patterns. Unlike psychoanalysis, CBT puts more emphasis on current problems and actionable changes, and is more proactive than supportive therapy alone. If the psychological condition of adolescent patients with seborrheic alopecia can be improved, the disease will also be weakened.

5. Conclusion

In summary, this paper analyses the causes of seborrheic alopecia, evaluated the effectiveness among adolescents and effect of existing treatment methods, and gave reasonable suggestions. There are many factors that lead to seborrheic alopecia, and for teenagers, the most prominent is unstable hormones, excessive psychological pressure, bad habits in life, and inappropriate hair care can lead to disease. Given adolescents' unique physiological and psychological characteristics, treatment efficacy must account for hormonal and mental health factors. In summary, timely intervention measures can be taken at an early stage to solve the problem of adolescent seborrheic alopecia. A 2% minoxidil foam formulation is recommended in Western medicine to minimize allergic reactions. In addition, it has been found through research that teenagers can use integrated Chinese and Western medicine treatments such as traditional Chinese medicine and acupuncture to improve the efficacy and reduce the side effects of Western medicine. Finally, to adjust the lifestyle, adjust the rest, diet, psychological pressure.

6. Evaluation

There are many highlights in this study. From a biomedical perspective, the close relationship between adolescents and seborrheic alopecia was fully verified by detecting the fluctuation curve of adolescent DHT level, analyzing the activity of hair follicle reductase, and evaluating the imbalance of scalp biome, and the pathological causes of seborrheic alopecia were demonstrated. In terms of psychosocial factors, studies by scholars show that adolescents are prone to seborrheic alopecia and are affected by psychological factors, which proves the particularity of the adolescentpopulation and emphasizes the discussibility of this article. Secondly, the existing treatment methods such as laser irradiation, 2% minoxidil foam reagent, traditional Chinese medicine acupuncture, etc., are supported by a large number of literature studies, which makes the conclusion more convincing.

However, there are still some limitations in this article. There are limited first-hand data and clinical experience on adolescent seborrheic alopecia. Therefore, in order to improve this loophole, this study suggests that alopecia seborrheic should be included in the management system of chronic diseases in adolescents, and the development of prevention and treatment guidelines for adolescent alopecia should be accelerated to fill the academic gap in this field and provide systematic solutions to improve the physical and mental health of adolescents.

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