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CASE REPORT

Effect of cannabis use on alopecia areata

Efeito do uso de cannabis na alopecia areata

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Abstract

Introduction: Alopecia areata (AA) is an autoimmune disease of the hair follicles causing unpredictable hair loss, occurring in about 2% of the general population throughout their lifetime. AA is associated with other concurrent disorders, such as depression, thyroid diseases, and anxiety. Cannabis receptors (CBRs), especially CB2Rs, are found on immune cells, including lymphocytes, macrophages, mast cells, natural killer (NK) cells, peripheral mononuclear cells, and microglia. We report the case of a girl who reported improvement in AA symptoms following marijuana use. **Case presentation**: A 15-year-old girl with alopecia universalis and multiple psychiatric diagnoses started self-medicating with cannabis for her symptoms over a year. She reported hair regrowth on her scalp but not anywhere else on the body. **Conclusion**: Endocannabinoids are a new natural candidate for treating and understanding autoimmunity. There is limited research on the effects of cannabis on AA, and this case report highlights its use as a potential treatment option for autoimmune diseases.

Keywords: Alopecia. Alopecia universalis. Autoimmune disease. Cannabidiol. Cannabis.

Resumo

Introdução: A alopecia areata (AA) é uma doença autoimune dos folículos pilosos que causa queda de cabelo imprevisível, ocorrendo em cerca de 2% da população geral ao longo da vida. A AA está associada a outros distúrbios concomitantes, como depressão, doenças da tireoide e ansiedade. Recetores de cannabis (CBRs), especialmente CB-2Rs, estão presentes em células imunes, incluindo linfócitos, macrófagos, mastócitos, células natural killer, células mononucleares periféricas e micróglia. Relatamos o caso de uma menina que relatou melhoria de AA universal após o uso de marijuana. **A presentação do caso**: Uma menina de 15 anos com alopecia universal e múltiplos diagnósticos psiquiátricos começou a automedicar-se com cannabis para seus sintomas há mais de um ano e relatou crescimento de cabelo no couro cabeludo, mas não em qualquer outro lugar do corpo. **Conclusão**: Os endocanabinóides são um novo candidato natural para o tratamento e compreensão da autoimunidade. Há pesquisas limitadas sobre os efeitos da cannabis na AA, e este relato de caso destaca seu uso como uma potencial opção de tratamento para doenças autoimunes.

Palavras-chave: Alopecia. Alopecia universalis. Doença autoimune. Cannabidiol. Cannabis.

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Background

Alopecia areata (AA) is an autoimmune disease of the hair follicles that causes hair loss in an unpredictable pattern, commonly presenting as a small annular or patchy bald lesion that affects the scalp[1]. A case of total hair loss on the scalp is known as alopecia totalis, and complete hair loss on the entire body is known as alopecia universalis[2]. After hair loss, the regrowth usually takes months and sometimes even several years, but there is never a guarantee for hair growth. However, the best prognostic factor is reported as the extent of hair loss during the index occurrence at the time of diagnosis. A less favorable prognosis is observed in early-onset (during childhood) AA and ophiasis variants. Nevertheless, remission is likely in patients who have had limited patchy hair loss for less than one year[3].

The prevalence of AA is estimated at 2% in the general population (global number) throughout the lifetime. Some studies have indicated that the disease is more prevalent in women, especially those above the age of 45 years. The disease is associated with other concurrent disorders, such as depression, anxiety, and thyroid disease[4]. Concomitant autoimmune diseases frequently occur, such as inflammatory bowel diseases, type 1 diabetes mellitus, and psoriasis, because of shared genes that predispose the individual to these diseases. The autoimmune predisposition is located in the major histocompatibility complex region that encodes the human leukocyte antigen molecules in the human cells, which serves as the major contributor to the AA phenotype of an individual. The immune cluster of differentiation (CD) 4^+, $CD8^+$, T-cell, and NK cells are known as a significant effector of AA disease pathogenesis.

Commonly, the disease onset is associated with a few factors, such as physical or emotional stress, vaccination, and febrile illness. The most frequently used treatment for an acute flare-up includes topical or systemic corticosteroids and, additionally, contact immunotherapy which is considered the most effective treatment for AA[5].

Cannabis is one of the oldest cultivated plants and has been used as raw material, food, and medicinal drug for thousands of years. The renewed interest in cannabis therapies has led to an increase in research on the effective use of cannabis extract, and it has been found that the endocannabinoid system (especially CB2 receptor activation) is a potential target in the treatment of inflammation and autoimmune-related diseases due to the activation of immune cells. CBRs in the brain are present at a high density in the frontal cortex, the basal ganglia, and the cerebellum, besides being in the hypothalamus, hippocampus, and anterior cingulate cortex[6]. Consistently, evidence has demonstrated a possible role for CB1R in the peripheral tissue. On the other hand, CB2Rs are found in immune cells, including lymphocytes, macrophages, mast cells, NK cells, peripheral mononuclear cells, and microglia. The immense articulation of CB2Rs on immune cells is a potential connection between autoimmunity and the use of cannabinoids as a treatment option. A study conducted on a group of high school and university students showed a significant reduction in immunoglobulin M, complement system component (C3, C4) levels in the treatment group that received dried leaves and stems of *Cannabis sativa (C. Sativa)* for about 6-24 months[7]. Additionally, there was a decline in the number of B-lymphocytes and NK cells.

We report the case of a teenage girl suffering from AA resistant to corticosteroids who experienced a marked improvement in hair growth while taking marijuana as an illicit drug.

Case presentation

A 15-year-old girl in 10th grade, diagnosed with mild intellectual disability, suffered from anxiety, particularly around strangers and in crowded places. She reported feeling worried about people judging her and eventually feeling embarrassed when around people. She also experienced bouts of palpitation, tremors, and blushing face and ended up in self-isolation. In her 3rd grade, she was diagnosed with alopecia universals and received multiple corticosteroid trials (intralesional, local, and systemic) with no effects. No other treatment modalities were received. She reported often being bullied and teased at school because of her looks. Consequently, to blend in with her peer group, she got involved in risky adolescent behaviors, such as shoplifting, skipping school, escaping home without parental knowledge, and drug use. She is physically healthy with no medical or other autoimmune disorders.

She began consuming marijuana in the 9th grade, taking it once a week or sometimes twice as well for 6 months. There were no significant side effects except it made her reaction time slow and blurred her judgment. However, smoking partially relieved her anxiety and made her calm. She believed smoking helped her sleep well and overcome the alopecia problem. She reported that gradually her hair started regrowing, especially on the scalp, but the drug had no effect on her eyebrow, lashes, or body hair.

She has difficulty focusing as she gets distracted easily. Due to her forgetfulness and disorganization, she lost essential items. She was reported as short-tempered and resorted to punching walls and windows as a way of expressing her anger. Notably, she has a family history of intellectual disability, attention deficit hyperactivity disorder (ADHD), mood disorders, and anxiety, which serve as significant risk factors. Subsequently, she was diagnosed with ADHD and social anxiety. Since her hair started to grow and reach the right length, she was convinced that cannabis was the most effective remedy for her condition and was unwilling to try any other medication. She was prescribed methylphenidate for ADHD in different forms, which helped her to focus; however, they also resulted in panic attacks and nausea. Her psychoeducational assessment revealed a total score for the first percentile. The appropriate medications were started to treat her anxiety and sleep difficulties, with plans to start a stimulant to treat ADHD symptoms.

Discussion and conclusion

A patient diagnosed with an autoimmune disease often needs a treatment strategy with low or minimal side effects, the most common of which are glucocorticoids, having great potential therapeutic effects. However, there are side effects with prolonged use. On the other hand, endocannabinoid is a new emerging natural candidate for treating and understanding the mechanism underlying autoimmunity. Multiple sclerosis is one of the autoimmune diseases that has reportedly been treated with cannabis[8]. The largest number of randomized controlled trials conducted regarding the medicinal use of cannabis is for the treatment of multiple sclerosis; however, the results of such studies lack consistency, possibly due to different limitations. Such a limitation of the study is it is difficult to completely blind participants to psychoactive substances.

Our patient was using cannabis, which proved to be an effective treatment for her alopecia. After using local and systemic glucocorticoids, she had no response, but after using cannabis, her hair grew, making her feel better about herself as a teen and allowing her to participate in social activities without hiding her hair. Her anxiety has improved to some extent, though we still need to add anxiolytics to her treatment. But the use of cannabis was associated with other risk factors as well. In the long term, she could develop psychosis, depression, or pulmonary disease from cannabis use since she was still young[9]. Attention is drawn to the fact that cannabis as an illicit drug may have medical and psychological consequences and that more medical forms of cannabis are needed to treat such conditions. Smoking cannabis is not the solution, even if it shows good results, since the local form must be examined and tested in these situations. To use cannabis safely in such cases, we need the medical formula and medical guidelines. We should be very careful when reporting such cases not to use cannabis as it is without considering the side effects. It has been reported that daily use of *C. sativa* can increase anxiety levels in a patient or even in a healthy individual[10]. For people aged 17 years and below, daily use of cannabis reduces the chances of a child completing high school, and they are less likely to obtain a college or university degree. Also, driving under the influence of cannabis may cause a risk because it alters the consumer's attention, memory, and decision-making functions. Each person may experience different impairments that may persist after acute intoxication.

On the other hand, the use of cannabis for the treatment of AA is based on the idea of triggering the CB2Rs to suppress the immune response. In a recent cross-sectional survey of 1,087 patients affected by AA, 55% of whom were current marijuana users, the greatest perceived improvement was in the symptoms of stress and psychiatric disorders, such as anxiety, sadness, and depression, while 80.4% of the respondents said the marijuana did not affect their hair loss. However, the study had certain limitations. It was conducted during the coronavirus disease of 2019 pandemic, which may have exacerbated symptoms like loneliness and anxiety. The accuracy of the response rate was uncertain as it was distributed across broad, overlapping listservs. So, further research is needed to elucidate the effects of cannabis on pathological aspects of AA[11].

The present case emphasizes the clinical importance of marijuana in improving AA and the patient's anxiety, thus, boosting her immunity; nevertheless, at the time of the interview, she still had ADHD and anxiety symptoms. In conclusion, endocannabinoids serve as a novel natural candidate for treating and understanding autoimmunity. Since there is a paucity of literature regarding the effects of cannabis on AA, this case report aims to draw attention to the use of endocannabinoids targeting the CB2Rs as a potential treatment option for autoimmune diseases.

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Conflicts of interest

None.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

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