



Short Communication

Olumniant (Baricitinib) oral tablets: An insight into FDA-approved systemic treatment for Alopecia Areata

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ABSTRACT

Olumniant (Baricitinib) has gained swift approval by the Food and Drug Administration (FDA) as a promising medication for the treatment of adults with severe Alopecia Areata. This drug has proven to be effective for various conditions including Covid-19 and Rheumatoid Arthritis as well as being found to be less costly and minimally invasive, with no need for post-operative management. However, its use has some considerable potential implications before its prescription can be made commonplace. Therefore, more trials need to be conducted to establish a more rigid safety profile.

On 13th June 2022, Olumniant (Baricitinib) oral tablets were officially approved by the Food and Drug Administration (FDA) as a systemic treatment for adult patients with severe Alopecia Areata (AA) [1]. The FDA has previously approved this drug as a safe treatment for multiple diseases such as Rheumatoid Arthritis in June 2018 [2] and Covid-19 on 10th May 2022 [3].

Alopecia is a complex autoimmune illness that causes non-scarring hair loss [4]. It has multiple complicated genetic and environmental causes and can potentially have a huge impact on quality of life, including but not limited to self-esteem issues, depression, and social anxiety [5]. This condition can affect any hair-bearing part of the body, most commonly the scalp [6]. AA can manifest itself in a variety of ways: it can range from small, well-defined patches of hair loss to a complete lack of body and scalp hair. Trichoscopy (a method of hair and scalp assessment used for diagnosing hair and scalp diseases) is used to detect point dystrophic hairs, and yellow spots, all of which are signs of AA [7]. It is commonly thought to resolve on its own yielding spontaneous hair regrowth in most cases however, in some cases it can take a longer time, causing additional psychotic and emotional disturbances such as anxiety and clinical depression [8]. Approximately 2% of the population is affected at some point in their lives [9]. Majority of cases appear in middle age, with half of these cases beginning in childhood and often being linked to other autoimmune illnesses such as systemic lupus erythematosus (SLE), atopic dermatitis and autoimmune thyroid disorders [10].

Experimental and clinical research has implicated autoimmune involvement in the development of AA. Genome-wide association

analyses show that due to ULBP ligands up-regulation both innate and acquired immunity play a role in the onset of disease [11]. Loss of hair follicle immune privilege culminates in infiltration of CD81 natural killer group 2D T cells and CD41 T cells in AA. Interferon- γ is secreted by CD81 T cells, which signals through Janus kinase (JAK)-1 and JAK2 in hair follicle epithelial cells and stimulates the release of interleukin-15, which signals through JAK1 and JAK3 in T cells. The peribulbar lymphocytic infiltration causes apoptosis in hair follicle keratinocytes, which inhibits cellular proliferation inside the hair matrix and hair shaft synthesis. The intensity of the inflammation and apoptosis results in follicular dystrophy and an early shift into the catagen phase, resulting in hair loss and the clinical appearance of AA [6,12].

There is a scarcity of therapeutic alternatives. According to a systematic review published in 2015, the use of steroids in combination with immunotherapy was found to be somewhat effective with no definitive cure or FDA-approved pharmaceutical interventions being found [13]. However, new studies have shown promise; Baricitinib, an oral, selective, reversible inhibitor of Janus kinases, which has been licensed in several countries, may interrupt cytokine signalling implicated in the aetiology of AA. Baricitinib was well tolerated in phase 2 of the randomized control study. Although there were no significant cardiovascular and thromboembolic complication, cancers, or serious infections during the roughly 12-month observation period, rates of treatment-emergent adverse events were consistent with expectations and comparable between groups, with infections of the upper respiratory tract being the most common [12].

The absence of curative treatment does not mean the absence of

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traditional treatments which include topical and systemic steroids, methotrexate, retinoids, topical immunotherapy, hydroxychloroquine, minoxidil, and anthralin yielding variable results [14]. New therapy alternatives are currently being developed among which Baricitinib is now being considered as an effective treatment option for patients with severe AA. Orally administered Baricitinib is a reversible and selective JAK1 JAK2 inhibitor. JAK inhibitors are pharmaceuticals that inhibit the tyrosine kinases JAK1, JAK2, JAK3, and tyrosine kinase 2 in general or specifically (TYK2) [15]. JAK kinases are cytoplasmic proteins expressed on Type I and II cytokine receptors. Some cytokines, such as IFN-, are involved in signal transduction when they bind to their receptors. STAT binds to the activated JAK, causing a series of processes such as phosphorylation, dimerization, and migration to the nucleus. In the nucleus, it alters gene transcription. As there are several cytokines implicated in the pathophysiology of AA, as JAK-STAT signalling requires IL-2, IL-7, IL-15, IL-21, and IFN- γ , this pathway is an appealing and promising therapeutic target [15,16].

Parallel to Andersen et al.'s study, JAK inhibitors are known to have rapid onset of action, with maximum itch-reducing properties, and are primarily designed for quick treatment in acute crisis, which requires fast control with an evident effect on auto-immune disorders including, but not limited to Atopic dermatitis [17]. They have emerged as a promising therapeutic approach in SLE, psoriasis, Rheumatoid Arthritis and Covid-19 which are all inflammation-prone diseases, similar to AA, which makes it, in theory, an ideal treatment for AA [18]. Baricitinib has a better safety profile than most of the other treatment modalities used for the treatment of AA. Additionally, it will make treatment of AA more accessible, and cost-effective, with better tolerability while eliminating the need for long-term post-operative treatment. However, it has a particularly higher potential for causing allergic reactions. Therefore, when encountering such a reaction or an infection following oral intake of certain dosages of this drug, there should be prompt discontinuation. It is also suggested that co-administration of multiple drugs along with Baricitinib should be prohibited before more trials are conducted establishing a more rigid safety profile. It is also extremely important to consider possible implications of the use of this drug in pregnant and nursing mothers as data in pregnant women are insufficient to inform drug-associated risks for major birth defects or miscarriage.

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Ethical approval

None.

Consent

No consent was needed.

Author contribution

Eman Ali; conducted literature search, came up with concept of this study, and helped with manuscript writing. Rabia Owais; conducted literature review, helped with drafting manuscript, Ayesha Sheikh; conducted literature review, helped with drafting manuscript. Asim

Shaikh; helped in editing and reviewing the manuscript.

Registration of research studies

1. Name of the registry:
2. Unique Identifying number or registration ID:
3. Hyperlink to your specific registration (must be publicly accessible and will be checked):

Guarantor

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Declaration of competing interest

None.

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