

BRAICITINIB TREATMENT REDUCED THE EXPANSION OF CD8+ T CELLS IN C3H MICE WITH SKIN GRAFTS-INDUCED ALOPECIA AREATA

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Background Alopecia areata (AA) is a worldwide autoimmune disease in humans characterized by patchy and sudden hair loss without scarring. The incidence and prevalence of AA are only exceeded by diabetes and rheumatoid arthritis. Although AA does not shorten life or cause physical disabilities, it is still considered a psychologically devastating disease with a substantial burden. The pathobiological mechanism of AA is not fully understood, resulting in no fully satisfactory or universally effective clinical therapy methods and preventive measures. Therefore, there is an urgent need for an animal model to systematically and mechanistically study AA. The skin grafts AA model in C3H/HeJ mice has been developed and became a reliable model for AA research. Aging C3H/HeJ mice develop spontaneous AA-like hair loss, and successful grafts from AA-affected C3H/HeJ to normal C3H/HeJ mice induce hair loss due to lymphocyte-mediated inflammation. The reproducible model provides a large number of AA-affected mice for pathogenesis study or treatment of human AA.

Methods Female C3H/HeJ were randomly separated into three groups. Mice in the Sham group received skin grafts from normal C3H/HeJ mice, while skin from C3H/HeJ mice with spontaneous alopecia areata was grafted onto mice in other groups. After 12 weeks of skin grafts, the mice in the non-sham group were regrouped based on the area of alopecia areata. Baricitinib was continuously administered for 10 weeks. The abdominal skin area of all mice was scored weekly, and spleens were harvested for viscera index measurement. A fixed area of the abdominal skin was paraffin-embedded for IHC staining.

Results Compared with Vehicle group, the Baricitinib group showed a significant decrease in the area of alopecia areata with increasing days of administration. The viscera index in Baricitinib group was significantly reduced compared to the high index in the vehicle group. Additionally, AA mice experienced an infiltration of CD8+ T cells around or inside their hair follicles. Baricitinib prevented the development of AA and the expansion of CD8+ T cells in all grafted recipients.

Conclusions A skin grafts-induced alopecia areata in C3H/HeJ mice was successfully established resulting in increased hair loss, spleen weight, and infiltration of CD8+ T cells around or inside hair follicles. Treatment of Braicitinib significantly reduced the area of alopecia areata, decreased the spleen weight, and prevented the expansion of CD8+ T cells.

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