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Evaluation of the Expression of Genes Associated with Inflammation and Apoptosis in Androgenetic Alopecia by Targeted RNA-Seq

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Abstract
Androgenetic alopecia (AGA) or male pattern baldness is the most common form of hair loss in humans. Despite being a very frequent dermatological entity, molecular pathophysiology remains unclear. Several authors relate the presentation of AGA with a premature apoptotic process during the anagen phase and with an inflammatory microenvironment in the hair follicle. We evaluated a panel of 30 genes associated with inflammation and apoptosis in 5 AGA patients by targeted RNA-Seq. *WNT7A* gene was highly expressed in patients in stages 3V to 5 on the Hamilton-Norwood scale compared to patients with 5A stage. *CASP7* and *TNF* genes were overexpressed in stages 3V and 4 compared to stages 5 and 5A. Overexpression of these genes detected only at early stages of AGA proves the role of WNT pathway, apoptosis, and inflammation in the development of this disorder.

Introduction

Androgenetic alopecia (AGA), or male baldness pattern androgenetic alopecia, is the most common form of hair loss in humans and affects 80% of Caucasian men and 40–50% of Caucasian women [1]. In AGA, there is an alteration of the hair growth cycle [2]. AGA is characterized by miniaturization of the hair follicle, a phenomenon that occurs due to a rapid change from the anagen phase to the catagen/telogen phase, which probably reflects an ongoing follicle apoptotic process [3]. During the hair growth cycle, there is an important interaction between growth factors such as cytokines, hormones, and neurotransmitters and their receptors [4]. However, it is still not clear if AGA results from disruption of proliferation or an increase in apoptosis in the hair follicle [5]. Despite this, one of the main targets of topic and systemic antioxidant therapies for AGA is apoptosis inhibition [6]. In fact, studies of drugs such as finasteride have shown decreased levels of caspases after 6 months of treatment in patients with AGA compared with healthy subjects [7]. Most studies evaluating caspases in patients with AGA

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