# Efficacy, safety, and tolerability of dutasteride 0.5 mg once daily in male patients with male pattern hair loss: A randomized, double-blind, placebo-controlled, phase III study

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***Background:*** Dutasteride (Avodart) is a dual inhibitor of both type I and type II 5 alpha reductases, and thus inhibits conversion of testosterone to dihydrotestosterone, a key mediator of male pattern hair loss.

***Objectives:*** The aim of this randomized double-blind phase III study was to compare the efficacy, safety, and tolerability of dutasteride (0.5 mg) and placebo for 6 months of treatment in male patients with male pattern hair loss.

***Methods:*** A total of 153 men, 18 to 49 years old, were randomized to receive 0.5 mg of dutasteride or placebo daily for 6 months. Efficacy was evaluated by the change of hair counts, subject assessment, and photographic assessment by investigators and panels.

***Results:*** Mean change of hair counts from baseline to 6 months after treatment start was an increase of 12.2/cm$^2$ in dutasteride group and 4.7/cm$^2$ in placebo group and this difference was statistically significant ($P$ = .0319). Dutasteride showed significantly higher efficacy than placebo group by subject self-assessment and by investigator and panel photographic assessment. There was no major difference in adverse events between two groups.

***Limitations:*** The study was limited to 6 months.

***Conclusions:*** This study clearly showed that 0.5 mg of dutasteride improved hair growth and was relatively well tolerated for the treatment of male pattern hair loss. (J Am Acad Dermatol 2010;63:252-8.)

***Key words:*** androgenetic alopecia; dutasteride; male pattern hair loss; treatment.

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Male pattern hair loss (MPHL) is a common, androgen-induced, progressive disorder in genetically predisposed subjects. Frequency and severity of MPHL increase with age and approximately 80% of Caucasian men have some sign of MPHL by the age of 70 years.[1,2] Many men regard hair loss to be an unwanted, distressing experience that diminishes their body image and adversely affects quality of life.[3]

Human skin, sebaceous glands, and hair follicles contain the 5 alpha reductase (5AR): 5AR enzyme system, which is needed to convert testosterone to dihydrotestosterone (DHT), the primary androgen responsible for MPHL.[4,5] There are two 5AR isoenzymes: type I 5AR is widely expressed especially in skin, including scalp, whereas type II 5AR is present

in hair follicles and prostate.[6-8] Dutasteride (Avodart) is a dual inhibitor of both type I and type II 5AR; it has been found to improve symptomatic benign prostatic hyperplasia and is well tolerated at doses of 0.5 mg daily for 4 years.[9-11] Phase II study of dutasteride in MPHL has been conducted, and a clear dose response was found between dutasteride and increased hair growth.[12] This dose response was found to be correlated with a reduction of observed levels of DHT in scalp. At a dose of 0.5 mg or more, dutasteride showed a greater increase in target area hair count compared with control after 12 and 24 weeks of treatment.[12] However, the patients treated with a daily dose of 2.5 mg of dutasteride showed increase of adverse events of decreased libido compared with the 0.5 mg of dutasteride group.

**CAPSULE SUMMARY**

- A total of 153 men with male pattern hair loss were randomized to receive 0.5 mg dutasteride or placebo daily for 6 months.
- Mean change of hair counts from baseline to 6 months after treatment start in dutasteride group (12.2/cm$^2$) was significantly more increased than in the placebo group (4.7/cm$^2$).
- There was no major difference in drug-related adverse events between the dutasteride group [5 of 73 (6.9%)] and the placebo group [7 of 75 (9.3%)].

Currently, only finasteride (1 mg) and minoxidil solution are approved by the Food and Drug Administration for the treatment of MPHL,[13-15] while few studies have been conducted on dutasteride for the treatment of MPHL.[12,16,17] Furthermore, no phase III, randomized controlled study has been conducted on the treatment of MPHL with dutasteride. Here we conducted a randomized, double-blind, placebo-controlled phase III study, aiming to compare the efficacy, safety, and tolerability of a single daily dose of 0.5 mg of dutasteride for 6 months versus placebo in male patients with MPHL.

## METHODS

### Patient population

Men of 18 to 49 years of age, with mild to moderate androgenetic alopecia (IIIv, IV, V modified Norwood-Hamilton classification) were enrolled in this study. The exclusion criteria applied were: a significant abnormality during a physical or laboratory evaluation, a history of topical minoxidil or any androgenic or antiandrogenic treatment during the previous 6 months or finasteride treatment within 12 months, or previous use of dutasteride. All patients were instructed not to change their hairstyle or hair color during the study. The institutional review boards approved the study protocol and written informed consent was obtained from the subjects before participating in this study.

### Study design

This was a multicenter, double-blind, placebo-controlled study. It consisted of a screening phase (21 ± 7 days before randomization), a treatment phase (6 months), and a 4-month follow-up phase. After initial screening visit, 153 eligible men were randomly assigned to dutasteride (0.5 mg) daily or placebo daily for 6 months. Subjects visited the hospital at 3, 6, and 10 months after treatment start.

### Efficacy assessment

The primary end point was hair growth based on hair counts, as assessed using macrophotographic phototrichogram technique on the vertex at 6 months.[18] The secondary end points were hair growth based on hair counts at 3 months, subject self-assessment of hair growth at 3 and 6 months, and photographic assessment by investigators and panels of changes in hair growth at 3 and 6 months.

### Hair count

Total hair counts including terminal and vellus hair were measured on 1-cm$^2$ circular areas of clipped hairs, selected from the anterior edge of the balding area on the vertex. Before macrophotography of this area, hairs were clipped over 1.9-cm diameter circle using a plastic transparent template. A small cosmetic ink tattoo in the center of the circle was used as a marker to identify the area of hair counting. Macrophotographs of the target area were taken with a camera system developed by Canfield Scientific Inc (Fairfield, NJ).[3] A technician converted the photographs into dot maps, and these were converted to hair counts using a computer imaging system. Hair counts were measured at baseline and after 3 and 6 months of treatment.

### Subject self-assessment

After 3 and 6 months of treatment, each subject was requested to perform self-assessment of his hair growth and the appearance of his scalp. Photographs on the vertex scalp were taken at screening, and 3 and 6 months. At 3 and 6 months, subjects were asked to complete the hair growth index (HGI). HGI consists of two parts as follows.

Without photographs, the subjects completed part A of the HGI at each visit, which consisted of 4