ORIGINAL ARTICLE

Finasteride for androgenetic alopecia is not associated with sexual dysfunction: a survey-based, single-centre, controlled study

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Abstract

Background The occurrence of sexual dysfunction side-effects associated with finasteride use in men with androgenetic alopecia (AGA) is thought to be less prevalent than is publicized. There is a need to investigate sexual dysfunction among finasteride users with population-based controls.

Objective To evaluate the presence of sexual dysfunction in men using finasteride or not using finasteride.

Method Adult men visiting a dermatologist's office for any reason were asked to complete a survey including a modified version of the Arizona Sexual Experience Scale (ASEX) to assess the presence of sexual dysfunction with and without finasteride use.

Results Data from 762 men aged 18–82 were collected: 663 finasteride users and 99 non-finasteride users. There were no significant differences between finasteride users and non-user controls in reporting sexual dysfunction using the ASEX. Regression analysis indicated that self-reporting libido loss and reduced sexual performance, not finasteride use, predict a higher ASEX score.

Conclusion The use of finasteride does not result in sexual dysfunction in men with AGA. These data are consistent with other large survey-based controlled studies.

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Conflicts of interest

The authors have nothing to declare.

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Introduction

Androgenetic alopecia (AGA) refers to pattern hair loss believed to be a result of follicle miniaturization in dihydrotestosterone (DHT) sensitized areas of the scalp.[1] Despite the common occurrence in over 70% of men,[2] onset has been shown to induce loss of self-esteem, depression, introversion, neuroticism and psychological impairment.[3–7] Thus, with only two Food and Drug Administration (FDA) approved medications available,[8] the 5-alpha-reductase inhibitor finasteride is generally considered an important contributor to male health and quality of life.

Conversely, a small percentage of finasteride users have associated the medication with sexual dysfunction and Post-Finasteride Syndrome (PFS). The term PFS refers to a combination of the former side-effects with a host of additional symptoms including fatigue, muscle weakness and cognitive problems.[9,10] Supporting evidence comes from a controlled trial where a slightly higher proportion of finasteride-treated vs. placebo-treated patients reported adverse events related to sexual function.[11] Additionally, an increase in reports of sexual dysfunction has been associated with both finasteride[12] and dutasteride[13] (similar 5-alpha-reductase inhibitor) in an extensive postmarketing database. Moreover, identifying finasteride-related sexual dysfunction may not be straightforward as onset has been described as varied, with reports shortly after drug commencement, during later treatment or after medication discontinuation.[9,10] There have also been critiques that the clinical trials which promoted finasteride as safe and well tolerated had inadequate safety reporting.[14] A mechanism is unknown but it has been proposed that finasteride may lead to a decreased production of neurosteroids, which may regulate sexual desire and function[15] and

that impaired testosterone metabolism might lead to relative oestrogen excess.[16]

Nonetheless, it has been stated that observations of finasteride-related sexual dysfunction are less prevalent in the actual clinical experience compared to reports in the literature.[17] Similarly, meta-analysis and systematic review of the literature found a lack of significant association of finasteride use for AGA treatment and sexual dysfunction.[18] To address the discrepancies, the International Index of Erectile Function (IIEF) questionnaire (standardized method for assessment of sexual dysfunction[19]) was employed to specifically investigate sexual side-effects of finasteride use in the treatment of AGA. In three large studies (n = 186,[20] 236,[17] 586[21]), no difference was observed in comparison with age-matched controls.

The Arizona Sexual Experience Scale (ASEX) is an additional survey that has been shown to be a reliable, valid and sensitive tool for measuring sexual dysfunction.[22] Benefits include short, easy to understand questions that are less intrusive and are easy to score and interpret while covering five major global aspects of sexual dysfunction.[22] Therefore, the ASEX was used to further investigate claims of finasteride-associated sexual dysfunction in AGA patients and compare this to sexual dysfunction in non-users.

Method

This was a survey-based study in a single-centre setting. Adult men visiting a dermatologist's office in Ohio, USA, for any reason were asked to complete a survey about sex. The survey included a modified Arizona Sexual Experience Scale (ASEX) and additional questions related to duration of finasteride use, reduced sexual performance and loss of libido during finasteride use (yes/no), and steps taken if sexual dysfunction was reported. Non-finasteride users completed the same survey, but questions did not refer to finasteride.

The ASEX consisted of 5 questions, with possible responses on a Likert scale ranging from 1 (extremely affirmative) to 6 (extremely negative) on each question. For example, the question 'How easily can you reach an orgasm?' is scored from 1—extremely easily to 6—never reach orgasm. Scores on the ASEX were summed for a total score with possible scores of 5–30. A score of 19 or higher was considered indicative of sexual dysfunction,[22] 15–18 mild sexual dysfunction and 14 or less indicative of no sexual dysfunction.

A one-way analysis of variance (ANOVA) was used to compare ASEX scores of finasteride and non-finasteride users. Chi-square tests were used to determine whether there were differences between finasteride and non-finasteride users for categorical variables (e.g. libido loss). A multiple regression was performed to determine whether finasteride use, age, libido loss and reduced sexual performance predicted ASEX scores. Analyses were performed using SPSS Statistics 20 (IBM, New Orchard Road, Armonk, New York, USA) with significance set to $\alpha = 0.05$.

Results

A total of 762 men completed the study, with 663 men reporting they were taking finasteride for varying lengths of time. There was no significant difference between the finasteride and the control group in mean age ($P = 0.832$; Table 1). The percentage of men self-reporting loss of libido ($P = 0.805$) or reduced sexual performance ($P = 0.332$) did not significantly differ between men taking finasteride and the control group (Table 2).

However, a one-way ANOVA showed an effect of finasteride on total score of the modified Arizona Sexual Experience Scale (ASEX), $F(1,760) = 14.69$, $P < 0.001$. The mean score on the ASEX was slightly lower in the finasteride group of men compared to the control group of men (Table 2). Men were further divided into three categories: no sexual dysfunction (score of 14 or less); mild sexual dysfunction (score of 15–18); and sexual dysfunction (score of 19 or higher). The number of men with ASEX scores of 19 or higher was significantly lower than the number of men with ASEX scores indicating no or mild sexual dysfunction in both the finasteride and the control group, $\chi^2(2) = 22.53$, $P < 0.001$. There was no difference between finasteride and control in the number of men with ASEX score of 19 or higher.

To address the question of what factors may predict scores on the ASEX, a multiple regression was performed using the independent variables of age, finasteride use (four levels: no use, <1 year, 1–5 years and 5+ years), self-report of libido loss and self-report of reduced sexual performance. The regression model was significant, with independent variables predicting ASEX score, $F(6, 723) = 58.28$, $P < 0.001$, adjusted $R^2 = 0.32$.

Table 1 Demographics of sample (N = 762 men)

	Finasteride	Control
# Participants	663	99
Age (Mean ± SD)	42.3 ± 13.2	42.0 ± 17.2
Age groups:		
18–29	137 (20.7%)	29 (29.3%)
30–49	286 (43.1%)	35 (35.4%)
50+	229 (34.5%)	34 (34.3%)
Missing	11 (1.7%)	1 (1%)
Total	663 (100%)	99 (100%)
Duration of use		
No finasteride	0	99
12 months or less	103 (15.5%)	0
1–5 years	299 (45.1%)	0
5+ years	259 (39.1%)	0
Missing	2 (0.3%)	0
Total	663	99

Missing data refer to survey respondents who did not complete the item in question.

Table 3 shows the regression coefficients and standard errors. All four of the independent variables significantly added to the prediction of the ASEX score. An increase in age of 1 year is associated with an increase in ASEX score of 0.063. If men self-reported a decrease in libido or sexual performance, ASEX score was predicted to be, on average, 2.64 and 2.03 points higher, respectively, than men that did not self-report libido loss or reduced sexual performance. Duration of finasteride in our model was compared to not using finasteride at all. Thus, for all durations of finasteride use, ASEX score was predicted to be, on average, less than that of no finasteride use. This does not mean that using finasteride results in lower scores on the ASEX. Rather, for two individuals of the same age with libido loss and reduced sexual performance, the individual taking finasteride is predicted, on average, to have a lower ASEX score (better sexual performance) by 1.2–1.6 points compared to the individual not taking finasteride.

Table 2 Summary of survey results (N = 762 men)

	Finasteride	Control
ASEX score (Mean ± SD):†	11.9 ± 3.5	13.4 ± 4.7
No dysfunction (14 and below)	502 (75.7%)	61 (61.6%)
Mild dysfunction (15–18)	143 (21.6%)	26 (26.3%)
Sexual dysfunction (19+)	18 (2.7%)	12 (12.1%)
Total	663 (100%)	99 (100%)
Self-report measures		
Libido loss:		
No	495 (74.7%)	77 (77.8%)
Yes	151 (22.8%)	22 (22.2%)
Missing	17 (2.6%)	0
Reduced sexual performance:		
No	527 (79.5%)	75 (75.8%)
Yes	118 (17.8%)	24 (24.2%)
Missing	18 (2.7%)	0

Missing data refer to survey respondents who did not complete the item in question; ASEX, Arizona Sexual Experience Scale (modified).
†Range of possible scores on ASEX is 5–30.

Table 3 Summary of multiple regression analysis, N = 730

Variable	*B*	SE	β
Intercept	9.740	0.480	
Age	0.063	0.009	0.232**
Loss of libido	2.642	0.356	0.297**
Reduced sexual performance	2.029	0.384	0.212**
Finasteride use:			
<1 year	−1.216	0.445	−0.111*
1–5 years	−1.521	0.361	−0.199**
5+ years	−1.612	0.371	−0.205**

*$P < 0.01$; **$P < 0.001$.
B, unstandardized regression coefficient; SE, standard error of the coefficient; β, standardized coefficient.

Discussion

Using the ASEX survey, sexual dysfunction reports in a population of 762 men were not significantly associated with finasteride use. Between the control group and finasteride-experienced patients, there was no difference in loss of libido, reduced sexual performance or the number of men with an ASEX score indicating sexual dysfunction. In contrast, results showed that increased age and self-reporting a decrease in libido or sexual performance were indicators for predicting a higher ASEX score. Therefore, the use of finasteride is not believed to be the cause of sexual dysfunction in AGA patients.

The association of sexual dysfunction and AGA patients might be explained through another aspect of the disease. Sexual dysfunction has previously been linked to both depression[23] and a negative body image[24] such as the possible impact of hair loss, especially in young men.[25] In a recent study, an increased risk of sexual dysfunction was observed in men 18–40 years of age with moderate to severe AGA and psychosocial impairment accredited to body image changes due to hair loss.[25] Likewise, an investigation of PFS patients revealed major depressive disorder in 50% (n = 16) of the population.[26] It has also been pointed out that an increased risk of sexual dysfunction may be inherent to alopecia-diagnosed men due to a modified conversion of testosterone to dihydrotestosterone observed in these patients.[27] Similarly, it has been suggested that prescribing guidelines have resulted in finasteride treatment arm populations that are naturally more susceptible to the development of sexual dysfunction vs. comparator populations. This scenario is illustrated in benign prostate hyperplasia trials where the former have been diagnosed for a longer duration and are often less healthy because alpha blockers are the preferred first-line treatment with finasteride recommended once the disease has progressed.[27] Once this variable is controlled for, no significant increase is observed in patients prescribed finasteride.[27]

In addition, there is evidence of a nocebo effect[28] (an adverse side-effect that is not a direct result of the specific pharmacological action of the drug). Consequently, patients counselled on potential sexual side-effects are more likely to experience them.[28] It is also important to examine the AGA studies which suggest that sexual dysfunction symptoms from finasteride use worsen with time and persist after medication is discontinued.[10,29,30] Key aspects to consider are the use of a retrospective design; a targeted patient population recruited from biased websites; and lack of placebo controls. Therefore, the results are subject to selection bias, possible placebo effects due to unknown prior counselling and recall bias as many had been experiencing sexual side-effects for more than 3 years.[31] Additionally, care must be taken when selecting a study population; for example, the prevalence of sexual dysfunction in the general population should be considered. Studies investigating prevalence in various regions and age groups have reported a high likelihood, from

approximately 5–50 per cent,[32–44] stressing the requirement for age-matched controls in the research of drug-induced sexual side-effects.

Overall, the use of the ASEX survey to investigate sexual dysfunction in 752 men aged 18–82 resulted in no connection to finasteride use. This reflects recent research which suggests that men with alopecia may be inherently more susceptible to sexual dysfunction regardless of treatment and that sexual dysfunction is not uncommon in the general population regardless of alopecia status. Therefore, as one of only two FDA-approved medications, it is recommended that finasteride continue to be prescribed for the treatment of AGA.

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