



## Original Research

# Evaluation of Sexual Dysfunctions in Male Patients with Androgenetic Alopecia

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### Abstract

**Objectives:** Androgenetic alopecia (AGA) is a common dermatologic condition among men. In this study, we aimed to investigate psychological comorbidities, sexual dysfunctions, and the relationship between them in male patients with AGA.

**Methods:** A total of 220 individuals aged between 18 and 45 years who applied to our dermatology outpatient clinic between June 2022 and June 2023 were included in this study, including 110 healthy male volunteers and 110 male patients diagnosed with AGA. To collect information about the individuals comprising the sample, a sociodemographic characteristics form prepared by the researcher, the Hospital Anxiety and Depression Scale (HADS), the Body Perception Scale (BPS), the Golombok–Rust Inventory of Sexual Satisfaction (GRIS), and the Sexual Health Inventory for Men (SHIM) were completed by the participants under the supervision of the researcher. The severity of AGA was determined using the Hamilton–Norwood Scale (HNS).

**Results:** In our study, it was found that the patient group was statistically significantly more negatively affected in terms of body satisfaction and had higher levels of anxiety, depression, and sexual dysfunction compared with the control group ( $p=0.028$ ,  $p=0.001$ ,  $p=0.001$ , respectively). It was found that impotence and the tendency to avoid sexual intercourse increased as anxiety symptoms increased in patients with AGA ( $p=0.010$ ,  $r=0.245$ ;  $p=0.006$ ,  $r=0.259$ , respectively). Furthermore, an increase in depressive symptoms in patients with AGA was shown to increase the tendency toward erectile dysfunction and premature ejaculation ( $p=0.027$ ,  $r=-0.210$ ;  $p=0.001$ ,  $r=0.366$ , respectively).

**Conclusion:** Physicians should take into account that AGA may trigger anxiety, depression, decreased body satisfaction, and sexual dysfunction in male patients, and patients should be evaluated in a multidisciplinary manner. While our study sheds light on future research, larger sample studies are needed to clarify these relationships.

**Keywords:** Androgenetic alopecia, anxiety, body perception, depression, sexual dysfunction

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Hair plays a key role in social and sexual communication as well as reflecting general health and well-being.

<sup>[1]</sup> Throughout history, bushy hair has symbolized vitality, health, and sexuality, while hair loss has connoted submission and impotence.<sup>[2]</sup> As with chronic and disfiguring diseases, progressive hair loss associated with loss of self-esteem and impaired body image can have negative

psychosocial and psychosexual effects on male patients. Very few studies in the literature have investigated the relationship between sexual health issues and psychological issues in male patients with androgenetic alopecia (AGA).<sup>[2-4]</sup>

Considering sexual dysfunction, sexual adverse effects such as decreased or loss of libido, ejaculatory disorders, erectile

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dysfunction (ED), etc. have been reported with 5- $\alpha$  reductase (5 $\alpha$ -R) inhibitors used for AGA treatment, and this condition is called postfinasteride syndrome.<sup>[5]</sup> Therefore, it is crucial to understand the pre-existing psychological and sexual effects of AGA in male patients in order to decide on therapy involving 5 alpha reductase inhibitors. The aim of our study was to evaluate sexual dysfunction, dermatological quality of life, body image, and levels of depression and anxiety experienced by male patients with androgenetic alopecia (AGA). We also aimed to compare these parameters with those of healthy volunteers and to investigate the relationship between disease severity and these parameters.

## Methods

Approval for the study was received from the Clinical Research Ethics Committee of the Health Sciences University Şişli Hamidiye Etfal Training and Research Hospital on 19 April 2022 under decision number 2057. The research was designed as a cross-sectional, case-control clinical study involving male patients with AGA without any previous treatment and healthy volunteers. A total of 220 individuals aged between 18 and 45 years who applied to our dermatology outpatient clinic between June 2022 and June 2023 were included in this study, including 110 healthy male volunteers and 110 male patients diagnosed with AGA. The researchers conducted the study in accordance with the Helsinki Declaration.

The diagnosis of AGA was based on dermatologic examination findings. The study was conducted with two groups. The first group consisted of male patients who did not use tobacco or alcohol, had no additional psychiatric diagnosis and/or treatment, and had no additional diseases that could cause sexual dysfunction (diabetes mellitus, neurological diseases, hypertension, chronic stress). The other group consisted of healthy volunteers who were similar to the patient group in terms of age, gender, and marital status, who visited the dermatology outpatient clinic with a complaint other than AGA, who did not use tobacco or alcohol, who had no additional psychiatric diagnosis and/or treatment, and who had no additional diseases that could cause sexual dysfunction (diabetes mellitus, neurological diseases, hypertension, chronic stress). Those who did not meet these criteria and those receiving additional psychiatric treatment were excluded from the study. Informed consent was obtained from each patient before participation in the study. Face-to-face interviews were conducted with patients and volunteers, information about the scales was provided, and then the sociodemographic characteristics form including variables such as age, gender, educational level, and marital status, along with the Hospital Anxiety and Depression Scale (HADS), Body Perception Scale (BPS), Golombok–Rust Inventory of Sexual Satis-

faction (GRISS), and Sexual Health Inventory for Men (SHIM), prepared by the researcher to obtain information about the individuals constituting the study sample, were completed by the participants under the supervision of the researcher. The severity of AGA was determined using the Hamilton–Norwood Scale (HNS) after examination by a physician in the outpatient clinic.

## HADS

The HADS was created by Zigmond and Snaith in 1983.<sup>[6]</sup> It was modified into Turkish by Aydemir et al.<sup>[7]</sup> in 1997, and its validity and reliability were evaluated. The HADS is a 14-question scale with a 4-point Likert-type response option, scored between 0 and 3. Seven of these questions measure anxiety, and seven measure the severity of depressive symptoms. Questions 1, 3, 5, 7, 9, 11, and 13 measure anxiety, while questions 2, 4, 6, 8, 10, 12, and 14 measure depression. A total score of 0–21 points can be obtained for each subscale. The cut-off point for the Turkish version was found to be 10 for the anxiety subscale, and 7 for the depression subscale. Scores above these values indicate risk.<sup>[6–8]</sup>

## GRISS

This scale was first created by Rust and Golombok in 1986.<sup>[9]</sup> Analyses revealed that it is a valid and reliable scale. The scale is used to evaluate the quality of sexual activity and sexual dysfunctions in heterosexual men and women. The Turkish standardization, reliability, and validity study was conducted by Tuğrul et al.<sup>[10]</sup> in 1993. The scale has two separate forms for men and women. Both forms consist of 28 items and 7 sub-dimensions. Common sub-dimensions are frequency, communication, satisfaction, avoidance, and touching. In men, there are additional sub-dimensions of impotence and premature ejaculation (PE). There are two items each for the frequency of intercourse and communication sub-dimensions, and four items each for the other sub-dimensions. Additionally, both forms include four items related to the nature of sexual intercourse, which fall outside the seven sub-dimensions. The scale is a 5-point Likert-type scale. The response options are “never,” “rarely,” “sometimes,” “mostly,” and “always.” The scoring system ranges from 0 to 4 points. Some items are scored in reverse. In the male version, items 1, 2, 3, 4, 8, 9, 12, 13, 15, 16, 19, 20, 21, and 25 are scored in reverse. Total and subscale scores are used to assess the test. High scores suggest problems with sexual function and relationship health.<sup>[9,10]</sup>

## SHIM

The SHIM, a simplified version of the International Index of Erectile Function (IIEF), can be used to detect the presence and severity of erectile dysfunction (ED). The IIEF was de-

veloped by Rosen et al.<sup>[11]</sup> in 1997. Today, it is one of the most widely used forms in men presenting with sexual complaints. Patients presenting with complaints of sexual dysfunction are assessed with the IIEF-5 form, a shortened version of the original scale. The Turkish validation study of the 5-question IIEF-5 form was conducted by Turunç et al.<sup>[12]</sup> in 2007. The degree of ED is determined according to patients' answers to the five questions in the test. Answers are scored between 1 and 5 points. Scores of 5–7 indicate severe ED, 8–11 indicate moderate ED, 12–16 indicate mild-to-moderate ED, and 17–21 indicate mild ED. Scores of 22–25 indicate no ED.<sup>[11–13]</sup>

### BPS

The BPS was developed by Secord and Jourand in 1953.<sup>[14]</sup> It is a scale developed to measure the level of dissatisfaction with various parts of the body and body functions. The Turkish validity and reliability study of the scale was conducted by Hovardaoğlu in 1992.<sup>[15]</sup> The scale is a 5-point Likert-type instrument consisting of 40 items. Each item questions different parts and functions of the body. Response options are scored as 1="I don't like it at all," 2="I don't like it," 3="I am undecided," 4="I like it," and 5="I like it a lot." Items are scored between 1 and 5 points, and the total score ranges from 40–200. A high total score indicates a high level of satisfaction with one's body. Scores below the cut-off point (135) indicate a low level of satisfaction with body perception.<sup>[14–16]</sup>

### HNS

Hamilton first described eight types according to the severity of the disease in 1951.<sup>[17]</sup> The classification was revised in 1972.<sup>[18,19]</sup> Finally, Norwood finalized the Hamilton classification and divided it into seven subgroups.<sup>[20]</sup> In stage 1, recession of the frontotemporal hairline is minimal or absent, while the severity of hair loss increases as the stage increases. In stage 7, only thinning hair starting from the anterior region of the ear and extending to the opposite side in a horseshoe shape is observed.<sup>[20,21]</sup>

### Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics 22. The Kolmogorov–Smirnov test was used to evaluate the distribution of parameters. When evaluating the study data, descriptive statistical methods (mean, standard deviation, frequency) were used. For the comparison of quantitative data, the Kruskal–Wallis test was used for intergroup comparisons of parameters that did not show a normal distribution, and Dunn's test was used to identify groups and subgroups that showed differences. Student's t-test was used to compare normally distributed parameters

between two groups, while the Mann–Whitney U-test was used to compare non-normally distributed parameters between two groups. The Chi-square test, Fisher–Freeman–Halton Exact Chi-square test, and Continuity (Yates) Correction were used to compare qualitative data, and logistic regression analysis was applied for multivariate analysis. Spearman's rho correlation was used to analyze non-normal data. Statistical significance was set at  $p < 0.05$ .

## RESULTS

A total of 220 men between the ages of 18 and 45 years participated in the study: 110 controls and 110 patients. The mean age was  $30.5 \pm 6.16$  years. All parameters were evaluated in two groups: "Patients" ( $n=110$ ) and "Controls" ( $n=110$ ). Table 1 shows that the ages were similar across the groups (Table 1).

### Comparison of test scale scores between patient and control groups

In the patient group, the total score of the GRISS scale and the scores of PE, touch, impotence, avoidance, satisfaction, and communication in the sub-dimensions of the GRISS scale were statistically significantly higher than those in the control group ( $p=0.001$ ,  $p=0.001$ ,  $p=0.004$ ,  $p=0.009$ ,  $p=0.003$ ,  $p=0.016$ ,  $p=0.006$ , respectively). HADS anxiety and depression scale scores were also higher in the patient group ( $p=0.001$ ). BPS and SHIM scores were lower in the patient group ( $p=0.028$ ,  $p=0.001$ ) (Table 2).

### Comparison of tests administered to patient and control groups in terms of scale cut-off scores

The rate of low satisfaction with body image in the patient group (20%) was statistically significantly higher than that

**Table 1.** Evaluation of the patient and control groups in terms of demographic characteristics

	Patient	Control	p
Marital status n (%)			
Single	50 (45.5%)	69 (62.7%)	
Married	59 (53.6%)	40 (36.4%)	<sup>1</sup> 0.017*
Divorced	1 (0.9%)	1 (0.9%)	
Education level n (%)			
Primary school	15 (13.6%)	4 (3.6%)	
High school	43 (39.1%)	35 (31.8%)	
University	47 (42.7%)	66 (60%)	<sup>2</sup> 0.016*
Master's degree	5 (4.5%)	5 (4.5%)	
Age mean $\pm$ SD	30.81 $\pm$ 6.34	30.19 $\pm$ 5.99	<sup>3</sup> 0.458

<sup>1</sup>Fisher Freeman Halton Exact Test, <sup>2</sup>Ki-kare test, <sup>3</sup>Student t test; \* $p < 0.05$ .

**Table 2.** Comparison of test scale scores between patient and control groups

	Patient (Min-Max)	Mean±SD (median)	Control (Min-Max)	Mean±SD (median)	p
BPS	42-196	152.71±22.75 (154)	100-200	160.63±19.74 (157)	0.028*
SHIM	5-25	19.07±3.79 (19)	13-25	21.44±2.72 (22)	0.001*
HADS scale anxiety	1-21	8.28±4.06 (8)	0-17	6.33±3.81 (6)	0.001*
HADS scale depression	0-16	7.26±3.22 (7)	0-12	5.58±3.16 (6)	0.001*
GRISS impotence	0-14	3.85±2.38 (4)	0-9	3.05±2.18 (3)	0.009*
GRISS PE	0-15	5.33±3.19 (5)	0-10	3.6±2.4 (3)	0.001*
GRISS touching	0-11	2.62±2.58 (2)	0-8	1.65±1.94 (1)	0.004*
GRISS avoidance	0-12	2.63±2.64 (2)	0-15	1.69±2.29 (1)	0.003*
GRISS satisfaction	0-55	4.75±5.48 (4)	0-11	3.51±2.39 (3)	0.016*
GRISS frequency	0-8	3.68±1.8 (4)	0-6	3.19±1.63 (3)	0.070
GRISS communication	0-8	2.46±2.19 (2)	0-6	1.61±1.59 (1)	0.006*
GRISS total score	5-51	24.97±11.21 (25)	0-47	18.15±9.2 (17)	0.001*
HNS	1-7	4.33±1.72 (4)	-	-	-

Mann Whitney U test. \*p<0.05. HADS: Hospital anxiety and depression scale; BPS: Body perception scale; GRISS: Golombok-rust inventory of sexual satisfaction; SHIM: Sexual health inventory for men; HNS: Hamilton-norwood scale; PE: Premature ejaculation.

in the control group (7.3%) (p=0.011). There was a statistically significant difference between the groups in terms of ED levels (p=0.001). The rate of mild-to-moderate ED in the patient group (18.2%) was significantly higher than that in the control group (4.5%). The rate of anxiety in the patient group (35%) was statistically significantly higher than that in the control group (17.3%) (p=0.004). The patient group had a higher rate of depression (57.3%) than the control group (39.1%) (p=0.007) (Table 3).

### Correlation between the HNS test administered to the patient group and other tests administered to the patient group, and the correlation between the HADS test administered to the patient group and other tests

No statistically significant correlation was found between HNS and the scores obtained from the different scales in the patient group (p>0.05) (Table 4). Statistically significant positive correlations were identified between the HADS anxiety score and the GRISS total score, as well as the impotence and avoidance scores in the subscales of the scale in the patient group (p=0.045, r=0.191; p=0.010, r=0.245; p=0.006, r=0.259, respectively). In the patient group, there was an inverse relationship between the HADS depression score and SHIM score, and a statistically significant positive relationship between the HADS depression score and GRISS total score and PE sub-score (p=0.027, r=-0.210; p=0.030, r=0.207; p=0.001, r=0.366, respectively) (Table 5).

**Table 3.** Comparison of tests administered to patient and control groups in terms of scale cut-off scores

	Patient n (%)	Control n (%)	p
BPS			
Low satisfaction	22 (20)	8 (7.3)	10.011*
High satisfaction	88 (80)	102 (92.7)	
ED			
No	33 (30)	62 (56.4)	20.001*
Mild	55 (50)	43 (39.1)	
Mild-moderate	20 (18.2)	5 (4.5)	
Moderate	2 (1.8)	0 (0)	
Anxiety			
Yes	39 (35.5)	19 (17.3)	10.004*
No	71 (64.5)	91 (82.7)	
Depression			
Yes	63 (57.3)	43 (39.1)	30.007*
No	47 (42.7)	67 (60.9)	

<sup>1</sup>Continuity (yates) düzeltmesi, <sup>2</sup>Fisher Freeman Halton Exact Test, <sup>3</sup>Ki-kare test. \*p<0.05. BPS: Body perception scale; ED: Erectile dysfunction.

## Discussion

In our study, we evaluated sexual dysfunction, depression, anxiety, and body perception in AGA patients who were not receiving antiandrogen treatment. The SHIM score of the AGA group was significantly lower than that of healthy

**Table 4.** Evaluation of the correlation between the HNS test applied in the patient group and other test results

Patient group	HNS
BPS	
r	-0.070
p	0.467
SHIM	
r	-0.096
p	0.319
HADS scale anxiety	
r	0.027
p	0.778
HADS scale depression	
r	0.104
p	0.279
GRISS impotence	
r	-0.015
p	0.875
GRISS PE	
r	0.100
p	0.297
GRISS touching	
r	0.037
p	0.700
GRISS avoidance	
r	0.070
p	0.465
GRISS satisfaction	
r	-0.030
p	0.754
GRISS frequency	
r	-0.024
p	0.804
GRISS communication	
r	-0.041
p	0.667
GRISS total score	
r	0.003
p	0.977

Spearman's rho korelasyon testi. HADS: Hospital anxiety and depression scale; BPS: Body perception scale; GRISS: Golombok-rust inventory of sexual satisfaction; SHIM: Sexual health inventory for men; HNS: Hamilton-norwood scale; PE: Premature ejaculation.

**Table 5.** Correlation of HADS anxiety and depression scores with other scale scores in the patient group

Patient group	HADS scale anxiety	HADS scale depression
SHIM		
r	-0.040	-0.210
p	0.676	0.027*
GRISS impotence		
r	0.245	0.130
p	0.010*	0.174
GRISS PE		
r	0.127	0.366
p	0.187	0.001*
GRISS touching		
r	0.158	0.050
p	0.100	0.607
GRISS avoidance		
r	0.259	0.120
p	0.006*	0.213
GRISS satisfaction		
r	0.124	0.108
p	0.196	0.260
GRISS frequency		
r	0.014	-0.078
p	0.883	0.416
GRISS communication		
r	-0.043	0.119
p	0.653	0.216
GRISS total score		
r	0.191	0.207
p	0.045*	0.030*

Spearman's rho korelasyon testi. \*p<0.05. HADS: Hospital anxiety and depression scale; GRISS: Golombok-rust inventory of sexual satisfaction; SHIM: Sexual health inventory for men; PE: Premature ejaculation.

individuals. Based on the cut-off point of the scale, the prevalence of mild-to-moderate erectile dysfunction (ED) in men with AGA was more than four times higher than in healthy subjects. Using another sexual satisfaction scale with sub-dimensions such as impotence, premature ejaculation (PE), touching, avoidance, satisfaction, and communication, the scores of the patient group were statistically significantly higher than those of the healthy control group. Our results suggest that patients with AGA may experience impaired sexual function, as reported in the study by Tas et al.<sup>[4]</sup>

Many studies demonstrating the relationship between ED and psychogenic factors are available in the literature.<sup>[22-24]</sup> In a study conducted in Japan (2005), it was reported that the risk of ED increased 2.48-fold with anxiety and 2.02-fold with depression.<sup>[25]</sup> Similarly, in a study on men, Feldman et al.<sup>[23]</sup> concluded that depression increased the prevalence of ED by 1.8 times, regardless of age. In a study reported from Türkiye, Balcı et al.<sup>[24]</sup> found that anxiety was significantly higher in patients with ED, and both depression and anxiety were higher in patients with PE than in patients without PE.

Depression and anxiety may also be comorbid psychological disorders in AGA patients. When we investigated anxiety and depression in our patients, we found that AGA patients showed more severe anxiety and depression symptoms than the healthy group. In fact, the association between AGA and mood disorders has previously been investigated. In a multicenter study by Titeca et al.<sup>[26]</sup> in 2019, the incidence of anxiety and depression in patients with AGA was found to be higher than in healthy controls. Tas et al.<sup>[4]</sup> reported that the incidence of anxiety and depression symptoms increased, especially in advanced-stage AGA patients. Similarly, Tabolli et al.<sup>[27]</sup> confirmed in their study that the prevalence of anxiety and depression was high in AGA patients. Our patients had more than twice the anxiety scores compared to healthy subjects, and this difference was statistically significant. Additionally, in the patient group, a positive and statistically significant correlation was found between the HADS anxiety score and the GRISS total score and the impotence and avoidance scores in the subscales of the scale. An inverse relationship was found between the HADS depression score and the SHIM score. There was also a strong positive correlation between the HADS depression score and the GRISS total score and PE sub-score. These findings suggest that sexual dysfunction and mood disorders are related in AGA patients. Based on the subgroup evaluations, anxiety was associated with both impotence and avoidance of sexual intercourse, while depression was linked with erectile dysfunction and premature ejaculation. However, this cross-sectional study makes it difficult to determine a cause-and-effect relationship between sexual dysfunction and anxiety and depression.

In terms of the relationship between body perception and AGA, our findings revealed that men with AGA were significantly less satisfied with their bodies and body image than healthy men. Body image can be defined as a mental representation of one's own body and how one feels about its appearance, whether positively or negatively. Body image can vary according to age, weight, health, and the cultural characteristics of the society in which an individual lives, as well as their external appearance.<sup>[28]</sup> Studies have shown that feelings of worthlessness, impaired body image satis-

faction, and shame are common in men who suffer from hair loss. In addition, women and men with intact hair reported in one study that balding men appeared older and less attractive.<sup>[29]</sup> In addition to the aforementioned factors, negative body perception has been linked with sexual dysfunction in several studies.<sup>[30]</sup> Hence, body perception contributes to sexual well-being.

Some studies have shown different results.<sup>[31]</sup> In a recent study conducted by Sinikumpu et al.<sup>[32]</sup> on 892 46-year-old men with AGA, no significant relationship was found between the presence or severity of AGA and sexual function, depression, quality of life, self-esteem, or anxiety. Severe AGA patients reported less sexual activity than non-AGA patients, although this was not statistically significant. While our study and the study by Tas et al.<sup>[4]</sup> included a wider age range, the study by Sinikumpu et al.<sup>[32]</sup> included only a 46-year-old male population. This discrepancy in the results is likely due to the age difference.

Lastly, in our study, no significant correlation was found between the clinical severity of hair loss and the other parameters.

### Strengths and Limitations

This study is the first to reveal the connection between sexual dysfunction, psychological disorders, and body image in individuals with androgenetic alopecia who have not undergone treatment. Sexual dysfunction was assessed using two questionnaires, and factors such as impotence, premature ejaculation, and erectile dysfunction were evaluated. However, due to the cross-sectional design of the study, it was not possible to establish a causal link between sexual dysfunction and psychological factors.

### Conclusion

In our study, we found that individuals with AGA exhibited higher rates of anxiety, depression, and sexual dysfunction and experienced a greater negative impact on body satisfaction than the control group. Furthermore, we concluded that an increase in anxiety symptoms among AGA patients corresponded to a higher likelihood of experiencing impotence and avoiding sexual intercourse. Similarly, an increase in depression symptoms correlated with a higher tendency toward ED and PE in these patients. AGA itself may trigger anxiety, depression, body dissatisfaction, and sexual dysfunction in male patients and should be considered by physicians, and patients should be evaluated in a multidisciplinary manner. Especially in treatment with 5 $\alpha$ -R inhibitors, it may be necessary to evaluate patients in this context before treatment. Further research is needed to clarify these relationships.

## Disclosures

**Ethics Committee Approval:** The study was approved by Health Sciences University Şişli Hamidiye Etfal Training and Research Hospital Ethics Committee (No: 2057, Date: 19.04.2022).

**Informed Consent:** Informed consent was obtained from each patient before participation in the study.

**Conflict of Interest:** The authors declare that there is no conflict of interest.

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**Use of AI for Writing Assistance:** Artificial intelligence (AI)-powered technologies (Large Language Models [LLMs], chatbots, or image generators such as ChatGPT) were not used in the study.

**Authorship Contributions:** Concept – O.V., I.K.A., A.A.; Design – O.V., I.K.A., A.A.; Supervision – O.V., I.K.A.; Fundings – O.V., I.K.A.; Materials – O.V., I.K.A.; Data collection &/or processing – O.V., I.K.A.; Analysis and/or interpretation – O.V., I.K.A.; Literature search – O.V., I.K.A.; Writing – O.V., I.K.A., A.A.; Critical review – O.V., I.K.A., A.A.

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