


Clinical Characteristics of Women with ADHD in Japan

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Purpose: Although gender differences have been reported in various aspects of adult attention-deficit hyperactivity disorder (ADHD), such as prevalence, comorbidities, and social functioning, there have been few such studies conducted in Japan. Our research investigated gender differences in sociodemographic and clinical characteristics of adults with ADHD in a Japanese clinical sample. Due to unique Japanese cultural ideals and expectations of women's behavior that are in opposition to ADHD symptoms, we hypothesized that women with ADHD experience more difficulties and present more dysfunctions than men. We tested the following hypotheses: first, women with ADHD have more comorbidities than men with ADHD; second, women with ADHD experience more social hardships than men, such as having less full-time employment and being more likely to be divorced.

Patients and methods: The subjects were 335 outpatients with a DSM-5 ADHD diagnosis, who visited our ADHD specialty clinic at Showa University Karasuyama Hospital in central Tokyo between April 2015 and March 2016. Sociodemographic and clinical characteristics were collected, and gender differences were compared.

Results: Results fully supported our hypotheses: women had a significantly higher psychiatric comorbidity rate, were significantly less likely to be a full-time employee, and were significantly more likely to be divorced than men with ADHD.

Conclusion: Consistent with research in other countries, women with ADHD have greater impairments than men with ADHD in Japan. The importance of understanding gender differences of ADHD-diagnosed adults within a sociocultural context is highlighted.

Keywords: ADHD, adults, gender difference, Japan

Introduction

Although gender difference is one of the crucial factors in understanding mental disorders,^{1,2} few studies of adult ADHD exist; in particular, research focusing on women with ADHD is lacking globally and in individual contexts. Historically, ADHD has been thought of as a childhood and male-dominant disorder;^{3,4} however, research over the past few years has found that ADHD symptoms persist well into adulthood⁵⁻⁸ and that prevalence in adults is similar between genders.^{9,10} Some researchers have argued that girls have fewer externalizing and overt symptoms of ADHD^{11,12} and that, as a result, they are likely to remain undiagnosed,^{11,13-15} and indeed, later diagnosis of women makes the prevalence similar between genders in adults.^{16,17} Thus, with an approximately 2.5% prevalence worldwide^{18,19} and a sizable group of affected women, it is important to investigate their clinical characteristics in adulthood in comparison to those of men with ADHD.

ADHD in adults is associated with significant functional impairments across multiple domains of life, including work, home, school, and social relations.²⁰

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Although findings remain inconclusive regarding gender differences, women with ADHD may face greater difficulties than their male counterparts in several areas. For example, Fedele and colleagues²¹ found that female college students with ADHD experience higher levels of impairment than male college students with ADHD in home life, social life, education, money management, and daily life activities. In terms of work, Fredriksen and colleagues²² found that compared to men, significantly more women with ADHD were long-term work-disabled (either unemployed but looking for work or completely out of work). They suggested the possibility that women are more prone to working in an ADHD-incompatible work environment or more subject to the disabling consequences of ADHD in a vocational context. Regarding social relations, Robin and Payson²³ studied couples in which one spouse had ADHD and found significantly more problems reported by non-ADHD partners if the affected spouses were women. They also discussed the burden of gender roles and expectations placed on women, which may increase the hardships faced by women with ADHD in marriage when compared to their male counterparts.

While frequent psychiatric comorbidities in adults with ADHD are well documented,^{3,14,24–28} findings on gender differences are scarce and heterogeneous. In a double-blind, placebo-controlled study, Robison et al²⁹ found that women with ADHD had higher levels of internalizing problems, such as depression, anxiety, sleep problems, and emotional dysregulation, than men with ADHD. Rasmussen and Levander³⁰ similarly reported a higher prevalence of affective, eating, and somatization disorders among women with ADHD. However, in Biederman et al,¹⁶ there were no gender differences in comorbidity rates of mood and anxiety disorders in adults with ADHD. Concerning substance use disorders, the authors found a higher prevalence in men than women,¹⁶ as corroborated by Rasmussen and Levander,³⁰ who found that substance abuse and criminality were more common among men than women with ADHD.

Japanese society is often described as a “high-context” society in which “homogeneity, collectivism, and group harmony are highly valued.”^{31,32} People are often required to read between the lines and follow certain sets of norms and expectations. *Yamatoadeshiko* refers to a woman who is gentle, polite, modest, reserved, delicate, quiet, attentive, organized, and patient;³³ these remain the ideal, expected female characteristics, and such women are generally

perceived as more appealing to men and society.^{33–35} Being in some ways almost the opposite of *yamatoadeshiko*, women with ADHD—inattentive or/and hyperactive-impulsive—may face greater vulnerability to secondary disorders or impairments due to experience of conflict with social ideals or of being perceived more negatively.

In the present study, we investigated clinical characteristics and gender differences in adults with ADHD in a Japanese clinical sample. Given the possible cultural impact on women with ADHD, we established two hypotheses: first, women with ADHD have more comorbidities than men with ADHD; second, compared to men, women with ADHD experience more social hardships, such as having less full-time employment and being divorced. We tested the hypotheses by collecting clinical and social data from outpatients who visited our ADHD specialty clinic at Showa University Karasuyama Hospital.

Materials and Methods

Participants

Showa University Karasuyama Hospital, located in central Tokyo, has an ADHD specialty clinic that focuses on diagnosis and treatments for adults with ADHD. Individuals who are suspected of having ADHD visit or are referred to the clinic from across Japan. Patients who visited our clinic between April 2015 and March 2016 were recruited consecutively, and only those fulfilling the DSM-5 criteria for ADHD were included. The exclusion criteria were people with an intelligence quotient (IQ) under 85 based on the Japanese Adult Reading Test (JART),³⁶ those who were aged under 18 years, and those with other psychiatric and medical conditions requiring urgent treatment. During the aforementioned period, 470 patients were assessed for eligibility, and 335 people (71%) were ultimately included in the study.

Assessments and Diagnosis

During the assessment interview that each patient received, the following information was collected: current chief complaints and problems, developmental and medical history, daily living and social situations (including work, marital status, and typical daily activity), physical illnesses, family history, history of psychiatric consultations, past psychiatric diagnoses, history of alcohol abuse and illicit drug use, and current medications. Behavioral and developmental history from infancy was

also collected from suitable informants for each patient, who had known the patient from early childhood to adulthood, and from school reports if available. The Japanese edition of Conners's Adult ADHD Diagnostic Interview for the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; CAADID)^{37,38} was used to assist the diagnosis of ADHD. Current ADHD symptoms were evaluated using the Japanese version of Conners's Adult ADHD Rating Scale Self-Report Screening Version (CAARS-S:SV-J).^{39,40} IQ was estimated by the Japanese Adult Reading Test (JART), which has been standardized and shown to yield adequate IQ estimates of Japanese adults.³⁶ The final diagnosis of ADHD and comorbid psychiatric disorders, if any, was made based on DSM-5 criteria with consensus between at least two psychiatrists involved in the assessment and CAADID interview.

Ethics

This study was evaluated and approved by the Medical Ethics Committee of Showa University School of Medicine, and the protocols were in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants included in the study after the study description was provided.

Statistical Analysis

All statistical analyses were carried out using SPSS version 20.0 (IBM, Chicago, IL, USA). Between-gender comparisons were made using the chi-squared test for categorical variables and Student's *t*-test for continuous variables by setting gender as the independent variable and each of the other demographic and clinical items as dependent variables: age, years of education, marital and employment status, family history, consultation history, past diagnoses, comorbidities, medications, and CAARS-S:SV-J Inattentive, Hyperactive-Impulsive, and Total (the sum of Inattentive and Hyperactive-Impulsive subscale) scores. A logistic regression analysis was performed for employment status, marital status, and comorbidity to evaluate the independent effects of gender on these dependent variables. Candidates for other explanatory variables were chosen from items that were statistically significant in the univariate analyses. Odds ratios (ORs) with corresponding 95% confidence intervals (95% CIs) were estimated. The level of significance was set at $p < 0.05$, and all tests were two-sided.

Results

Data of 335 participants were analyzed, namely those of 156 women (46.6%) and 179 men (53.4%). Their demographics and clinical characteristics are shown in Table 1. No gender difference was found for age or years of education. The mean age was 32.0 (SD = 9.2) years, with most participants (94.3%) being in their 20s to 40s. The educational level was high, as 83.3% of participants had more than 12 years of education, with an average of 14.8 (SD = 1.8) years.

As expected, the mean CAARS-S: SV-J scores were high: total ADHD symptoms of 29.2 (SD = 9.4), inattentive symptoms of 18.7 (SD = 5.0), and hyperactive-impulsive symptoms of 10.5 (SD = 5.8). While inattentive and total ADHD symptom scores were similar across genders, hyperactive-impulsive symptoms score was significantly higher in men than in women (11.3 vs. 9.6, $t[333] = 2.79$, $p = 0.01$).

Although only 31.9% of participants had experienced marriage, significantly more women than men were divorced (7.7% vs. 1.7%, $\chi^2 = 7.05$, $df = 1$, $p = 0.014$). Occupational status also showed significant gender differences: women were less likely to have full-time employment than men (34.0% vs. 55.3%, $\chi^2 = 15.31$, $df = 1$, $p < 0.001$) and more likely to have part-time jobs (28.8% vs. 12.3%, $\chi^2 = 14.28$, $df = 1$, $p < 0.001$). The unemployment rate was 16.7% with no gender difference.

Nearly half of the participants had a family history of either ADHD (40.6%) or ASD (4.2%). Of those who had sought previous psychiatric consultation, one in two had received an ADHD diagnosis, and depression was the second most common diagnosis for both genders. Women were more likely to be previously diagnosed with bipolar disorder than men (9.6% vs. 3.4%, $\chi^2 = 5.57$, $df = 1$, $p = 0.023$).

Approximately one-fifth (18.5%) of the participants had comorbid psychiatric disorders, and the gender difference was significant: women had a higher overall comorbidity rate than men (24.4% vs. 13.4%, $\chi^2 = 6.63$, $df = 1$, $p = 0.011$). Mood disorders were the most common comorbidities (depression 3.9%, bipolar disorder 3.6%), although no disorder-specific difference was found by gender. Rates of both alcohol abuse (1.2%) and illicit drug abuse (1.8%) were low, with no gender difference. Approximately one-third (32.8%) of the participants were taking psychiatric medication; of these, only half were taking drugs for ADHD (16.0%). Significantly more women than men were prescribed mood stabilizers (11.5% vs. 5.0%, $\chi^2 = 4.77$, $df = 1$, $p = 0.043$).

As shown in Table 2, logistic regression analyses revealed that being female significantly increased the

Table 1 Demographics and Clinical Characteristics by Gender

	Total Sample (n = 335)	Women (n = 156)	Men (n = 179)	p
Age, mean (SD)	32.0 (9.2)	32.6 (9.9)	31.4 (8.4)	0.21
Age by decade, n (%)				
10s	6 (1.8)	3 (1.9)	3 (1.7)	>0.99
20s	153 (45.7)	70 (44.9)	83 (46.4)	0.83
30s	108 (32.2)	43 (27.6)	65 (36.3)	0.1
40s	55 (16.4)	32 (20.5)	23 (12.8)	0.08
50s	12 (3.6)	8 (5.1)	4 (2.2)	0.24
60s	1 (0.3)	0 (0)	1 (0.6)	>0.99
Years of education, mean (SD)	14.8 (1.8)	14.6 (1.6)	15.0 (1.9)	0.05
Education in detail, n (%)				
Not completed compulsory education (<9 years)	3 (0.9)	0 (0)	3 (1.7)	0.25
Completed compulsory education or high school (9–12 years)	53 (15.8)	27 (17.3)	26 (14.5)	0.55
Higher education (>12 years)	279 (83.3)	129 (82.7)	150 (83.8)	0.88
Current marital status, n (%)				
Single (never married)	228 (68.1)	100 (64.1)	128 (71.5)	0.16
Married (including remarried)	92 (27.5)	44 (28.2)	48 (26.8)	0.81
Divorced (single after divorce)	15 (4.5)	12 (7.7)	3 (1.7)	0.01
Employment status, n (%)				
Full-time employment	152 (45.4)	53 (34.0)	99 (55.3)	<0.01
Student/homemaker	60 (17.9)	31 (19.9)	29 (16.2)	0.4
Part-time employment	67 (20.0)	45 (28.8)	22 (12.3)	<0.01
Unemployed	56 (16.7)	27 (17.3)	29 (16.2)	0.88
CAARS-S: SV scores, mean (SD)				
Inattentive symptoms	18.7 (5.0)	19.1 (4.9)	18.5 (5.1)	0.27
Hyperactive-impulsive symptoms	10.5 (5.8)	9.6 (5.2)	11.3 (6.2)	0.01
Total ADHD symptoms	29.2 (9.4)	28.6 (8.7)	29.7 (10.0)	0.27
Family history ^a , n (%)				
Present	160 (47.8)	77 (49.4)	83 (46.4)	0.66
ADHD	136 (40.6)	61 (39.1)	75 (41.9)	0.66
ASD	14 (4.2)	8 (5.1)	6 (3.4)	0.43
Other	16 (4.8)	11 (7.1)	5 (2.8)	0.08
Consultation history, n (%)				
Previously consulted	220 (65.7)	109 (69.9)	111 (62.0)	0.14
Previous diagnosis, n (%)				
ADHD	104 (31.0)	48 (30.8)	56 (31.3)	> 0.99
Depression	56 (16.7)	31 (19.9)	25 (14.0)	0.19
Anxiety disorder	29 (8.7)	18 (11.5)	11 (6.1)	0.12
ASD	18 (5.4)	6 (3.8)	12 (6.7)	0.33
Bipolar disorder	21 (6.3)	15 (9.6)	6 (3.4)	0.02
Schizophrenia	12 (3.6)	8 (5.1)	4 (2.2)	0.24
Illicit drug use	6 (1.8)	2 (1.3)	4 (2.2)	0.69
Alcohol abuse	4 (1.2)	1 (0.6)	3 (1.7)	0.63
Other	20 (6.0)	11 (7.1)	9 (5.0)	0.49
Current psychiatric comorbidity, n (%)				
Present	62 (18.5)	38 (24.4)	24 (13.4)	0.01

(Continued)

Table 1 (Continued).

	Total Sample	Women	Men	p
	(n = 335)	(n = 156)	(n = 179)	
Depression	13 (3.9)	8 (5.1)	5 (2.8)	0.4
Bipolar disorder	12 (3.6)	8 (5.1)	4 (2.2)	0.24
ASD	9 (2.7)	3 (1.9)	6 (3.4)	0.51
Anxiety disorder	9 (2.7)	6 (3.8)	3 (1.7)	0.31
Alcohol abuse	4 (1.2)	1 (0.6)	3 (1.7)	0.63
Illicit drug use	6 (1.8)	2 (1.3)	4 (2.2)	0.69
Schizophrenia	1 (0.3)	1 (0.6)	0 (0)	0.47
Other	18 (5.4)	12 (7.7)	6 (3.4)	0.09
Pharmacotherapy, n (%)				
Taking any psychoactive medication	110 (32.8)	56 (35.9)	54 (30.2)	0.3
ADHD medications	52 (15.5)	22 (14.1)	30 (16.8)	0.55
Hypnotics	46 (13.7)	24 (15.4)	22 (12.3)	0.43
Antidepressants	35 (10.4)	22 (14.1)	13 (7.3)	0.05
Major tranquilizers	33 (9.9)	17 (10.9)	16 (8.9)	0.59
Antianxiety	32 (9.6)	19 (12.2)	13 (7.3)	0.14
Mood stabilizers	27 (8.1)	18 (11.5)	9 (5.0)	0.04
Other	9 (2.7)	6 (3.8)	3 (1.7)	0.31

Notes: Statistically significant p-values are in bold; ^aIncludes duplication.

Abbreviations: ASD, autism spectrum disorders; SD, standard deviation; ADHD, attention deficit hyperactivity disorder.

likelihood of being out of full-time employment (adjusted odds ratio [aOR], 2.99; 95% confidence interval [CI]: 1.79–4.98), being divorced (aOR, 5.79; 95% CI: 1.17–28.58), and having any psychiatric comorbidity (aOR, 2.81; 95% CI: 1.51–5.25).

Discussion

We studied gender differences in sociodemographic and clinical characteristics in a clinical sample of Japanese adults with ADHD. The results fully supported our hypotheses that women with ADHD have more comorbidities and are more socially disadvantaged (ie, less likely to be in full-time employment, more likely to be divorced) than men. The gender ratio of our sample was almost equal (men:women = 1.1:1), consistent with previous findings in other countries^{9,10} that the gender gap in prevalence declines in adult ADHD. Notably, nearly 70% of participants had not received an ADHD diagnosis until participating in the study, indicating that, for both genders, a large proportion of individuals with ADHD are left undiagnosed until adulthood. In accordance with previous studies,^{12,41} men had more hyperactive-impulsive symptoms than women.

As predicted, women with ADHD experienced greater difficulties than men in several social domains, particularly

work and marriage. Our results that significantly fewer women were in full-time employment and more in part-time jobs and divorced are consistent with studies in other countries showing that more women than men with ADHD are long-term work-disabled²² and that ADHD in women is less tolerated in marriage.²³ With gender inequality still existing in Japan, firms are inclined to hire and assign men to more active and creative positions, while women are placed in more routine clerical work, such as general administration, reception, and window service.^{35,42} Similarly in marriage, women are expected to take the main role in household management.^{33,35,43} *Yamatonadeshiko* characteristics are highly valued in such roles so that women with ADHD—with symptoms of inattention or/and hyperactivity and impulsivity—could be highly prone to negative evaluations, intolerance, and low self-esteem. Viewing the results in this sociocultural context, general Japanese population statistics for people with similar demographic characteristics to our participants (university graduates and persons in their 20s to 40s) indicate full-time employment rate of 84.2% and 60.3%, part-time employment of 2.65% and 13.8%, and unemployment of 3.27% and 1.72% for men and women, respectively.^{44–46} For both genders, full-time employment rates are smaller and those of part-time and unemployment larger in our ADHD sample. Importantly, the proportion of

Table 2 Logistic Regression Analyses of Employment Status, Marital status, And Comorbidity

Variable	Employment Status (Full-Time) ^a		Marital Status (Divorced)		Comorbidity	
	Risk of Being Out of Full-Time Work		Risk of Being Divorced		Risk of Having Comorbidity	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age	1.06 (1.04–1.09)**	1.07 (1.04–1.10)**	1.09 (1.03–1.15)**	1.09 (1.03–1.16)**	0.98 (0.95–1.01)	0.98 (0.94–1.01)
Gender	2.41 (1.54–3.75)**	2.99 (1.79–4.98)**	4.89 (1.35–17.66)**	5.79 (1.17–28.58)*	2.08 (1.18–3.66)*	2.81 (1.51–5.25)**
Years of education	1.27 (1.11–1.44)**	1.22 (1.06–1.40)**	0.67 (0.51–0.87)**	0.67 (0.48–0.92)*	1.03 (0.88–1.20)	1.05 (0.89–1.25)
Employment status (full-time)	Not in equation	Not in equation	0.59 (0.20–1.76)	0.74 (0.21–2.65)	0.84 (0.48–1.47)	1.16 (0.61–2.18)
Marital status (divorced)	0.59 (0.20–1.76)	0.60 (0.17–2.08)	Not in equation	Not in equation	0.67 (0.15–3.03)	0.79 (0.16–3.92)
Comorbidity	0.84 (0.48–1.47)	1.15 (0.61–2.15)	0.67 (0.15–3.03)	0.71 (0.13–3.81)	Not in equation	Not in equation
CAARS inattention	0.98 (0.94–1.03)	1.03 (0.97–1.10)	1.15 (1.01–1.31)	1.11 (0.94–1.33)	0.93 (0.88–0.98)**	0.89 (0.83–0.95)**
CAARS hyperactivity-impulsivity	0.97 (0.94–1.01)	0.95 (0.91–1.00)	1.07 (0.98–1.16)	1.05 (0.93–1.19)	1.00 (0.95–1.05)	1.07 (1.01–1.14)*

Notes: **p* < 0.05, ***p* < 0.01. ^aFemale = 0, male = 1.

people in full-time employment in our ADHD sample as compared to the general population is 66% for men and 56% for women; the smaller ratio in women indicates the particular burden on females with ADHD in getting or maintaining full-time work. In addition, although the part-time work ratio between our ADHD sample and the general population was greater in men (4.6 to 1) than in women (2.1 to 1), the ratio for unemployment was greater in women (10.1 to 1) than in men (5.0 to 1), possibly demonstrating a tendency for females with ADHD to become unemployed while male counterparts find part-time work. Similarly, the proportion of divorced individuals in the general population is 2.92% for men and 5.66% for women.⁴⁷ These values were 0.6 times smaller in men and 1.4 times larger in women with ADHD in the sample. Although this cannot be an exact comparison, the gender differences in work and marriage in our ADHD sample are not a mere reflection of the background population trends but show the possible additional burden on women with ADHD, in association with the gender inequality and unique cultural attitudes in Japan. However, some caution is required when interpreting the divorce results, due to the small number of divorced individuals in our sample.

Unsurprisingly, women with ADHD had more comorbidities than men. Women with ADHD may experience increased proneness to develop secondary psychiatric disorders due to lower self-esteem and symptom internalization. Lower self-esteem has been found in women with ADHD⁴⁸ and in turn, is related to the onset of various mental disorders.⁴⁹ The relative lack of externalized or overt symptoms of ADHD^{11,12} may also delay diagnosis in women,^{11,13,15,16} leading to additional comorbid problems. The constant failure of women with ADHD to conform to social ideals and expectations of Japanese culture may exacerbate this process. No disorder-specific gender difference was found, in contrast to some studies that reported greater internalizing of problems in women than in men.^{29,30,50} We attribute this to bias in our sample, as only adults exhibiting ADHD symptoms (and not those of other psychiatric disorders) are likely to visit or be referred to our ADHD specialty clinic. Indeed, the comorbidity rates for all observed disorders were strikingly lower than those reported in previous studies.^{3,14,24–28,51,52} The results that women were more likely to have a past diagnosis of bipolar disorder and to be prescribed mood stabilizers may support the higher prevalence of affective problems in women, as reported in previous studies.^{29,30}

Our findings must be viewed in the context of several limitations. First, the study lacked a normal control population, such that we could provide only an approximate comparison to national demographic statistics. Second, the total sample size was only 335, making conclusions less precise than ideal. Third, the data were based on a clinical sample of outpatients who visited our ADHD specialty clinic and might not accurately represent the whole ADHD population in Japan. Only participants with serious and obvious symptoms of ADHD and without other urgent psychiatric conditions are likely to self-refer or be referred. Third, we did not exclude participants who were already taking ADHD medications. Although only 16% were prescribed such medications, with no gender difference in the proportion, this could still possibly have confounded the results regarding social functioning in both genders. A further multi-center study with a normal control group is planned for the future.

Conclusion

In this clinical sample-based study, Japanese women with ADHD were found to have a higher psychiatric comorbidity rate and more functional impairments in marital and vocational domains than men with ADHD. Cultural ideals and expectations of women in Japan may contribute to greater difficulties faced by women with ADHD. Further larger, multi-center studies are planned to explore symptom manifestations and self-esteem.

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Disclosure

The authors report no conflicts of interest in this work.

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