

Short Communication

Childhood histories of attention-deficit hyperactivity disorders in Japanese methamphetamine and inhalant abusers: Preliminary report

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Abstract

The present study examined childhood histories of attention-deficit hyperactivity disorder (ADHD) in 54 methamphetamine and 12 inhalant abusers using the Wender Utah Rating Scale. The inhalant abusers experienced initial drinking at a younger age than methamphetamine abusers ($P = 0.038$). The Wender Utah Rating Scale score was significantly higher in the inhalant abusers than in the methamphetamine abusers ($P = 0.013$) although 83.3% of inhalant and 55.6% of methamphetamine abusers had higher scores than the cut-off for ADHD. These findings suggest that drug abuse is associated with childhood ADHD, and that inhalant abusers have a higher incidence of childhood ADHD than methamphetamine abusers.

Key words

attention-deficit hyperactivity disorder, inhalant, methamphetamine, self-medication, Wender Utah Rating Scale.

INTRODUCTION

Recently, many studies have suggested a relationship between substance abuse and childhood histories of attention-deficit hyperactivity disorder (ADHD).^{1–3} Horner reported that drug abusers with childhood ADHD tended to improve negative self-image with drug use.⁴ Some studies reported that cocaine abusers had the most frequent childhood ADHD among various types of drug abusers.^{5,6} These findings suggested that cocaine abusers with childhood ADHD may medicate their dopamine-deficient states with cocaine, just as ADHD children are medicated by methylphenidate, because cocaine is a stimulant similar to methylphenidate.^{5,7}

However, it remained unclear whether drug abusers with childhood ADHD really choose the stimulant for self-medication. Japanese drug abusers with childhood ADHD may choose methamphetamine (MAP) rather than inhalant because MAP is the most popular stimulant in Japan, while inhalants are the most popular suppressant.⁸ However, there have been no studies concerning the relationship between drug abusers and childhood ADHD in Japan.

In the present study, we compared childhood histories of ADHD between MAP and inhalant abusers to clarify the association of childhood ADHD with drug choice.

METHODS

Subjects included 54 MAP abusers and 12 inhalant (toluene, $n = 4$; butane, $n = 8$) abusers. These abusers were inpatients of Kanagawa Psychiatric Center, Serigaya Hospital from June 2002 to September 2003, and had met the *Diagnostic and Statistical Manual of Mental Disorders* (4th edn; DSM-IV) criteria of substance use disorders concerning either MAP or inhalants. The sample

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size of inhalant abusers was considerably smaller compared to that of MAP abusers, because inhalants are less likely to cause severe dependence and psychosis than MAP, and result in only a small proportion of drug-abusing inpatients. Written informed consent was obtained from all participants, and the Ethic Committee in Kanagawa Psychiatric Center approved the study.

To evaluate childhood ADHD trait, a structured interview was preformed by a psychiatrist (AK) within 3 days of intake, using the Wender Utah Rating Scale (WURS).⁹ The WURS was developed as a screening instrument for retrospective evaluation of childhood ADHD without parental information. Although this instrument originally consisted of 61 items concerning various behavior problems in childhood, 25 items, which showed the greatest differences between the patients with childhood ADHD and non-patient comparison group,⁹ were generally used. Each item is answered by selecting from the following five categories: not at all or very slightly (score = 0), mildly (score = 1), moderately (score = 2), quite a bit (score = 3), and very much (score = 4). Ward *et al.* established the validity and availability of the WURS.⁹ In the present study, the subjects were tested by the 25 items of the WURS translated into Japanese with permission by Professor Paul Wender, although the validity of the Japanese version had not been established. Dr Paul Wender approved the English version translated from our Japanese version of the WURS. In the present subjects, Cronbach's α coefficient of correlation between all the items of the WURS was 0.950, although further study demonstrating validity of our Japanese version is required.

We compared WURS scores and the demographic information and substance use histories obtained from

an intake of MAP and inhalant abusers. All statistical analyses were performed using the SPSS software for Windows (version 11.0, SPSS, Chicago, IL, USA). Student's *t*-test was performed for continuous variables, and Pearson's χ^2 test was performed for categorical variables between the two groups. Two-tailed $P < 0.05$ was accepted as indicating significance.

RESULTS

Table 1 lists patient data, substance use histories, and WURS scores for the MAP and inhalant abusers. No significant differences existed in age at admission and gender between the two groups, while inhalant abusers more frequently had >12 years education than MAP abusers ($P = 0.004$). Seventy percent of MAP abusers had used inhalants, although only one-quarter of inhalant abusers had used MAP. Although no significant differences existed in age of beginning smoking and using any kinds of psychoactive drugs, the inhalant abusers had begun drinking significantly earlier than the MAP abusers ($P = 0.038$).

The WURS score was significantly higher in the inhalant abusers than in the MAP abusers ($t = 2.710$, d.f. = 64, $P = 0.013$; Fig. 1). There were no significant differences in proportion of the subjects with ≥ 46 on the WURS score between the two groups, although the proportion of inhalant abusers tended to be higher than that of MAP abusers (83.3% vs 55.6%, $\chi^2 = 2.459$, d.f. = 1, $P = 0.075$).

DISCUSSION

To our knowledge, this is the first study to examine the relationship between drug choice and childhood

Table 1. Comparison between MAP and inhalant abusers

	MAP abusers <i>n</i> = 54 Mean $\pm$ SD	inhalant abusers <i>n</i> = 12 Mean $\pm$ SD	<i>t</i> or χ^2	d.f.	<i>P</i>
Age at admission (years)	32.8 $\pm$ 7.8	31.8 $\pm$ 8.1	0.428	64	0.681
Gender (%male)	63.0%	50.0%	0.691	1	0.406
>12 years education	16 (30.2%)	9 (75%)	8.301	1	0.004
Experiences of inhalants use	38 (70.4%)	—	—	—	—
Experiences of MAP use	—	3 (25.0%)	—	—	—
Age at initial smoking (years)	14.2 $\pm$ 2.1	13.1 $\pm$ 2.2	1.489	64	0.156
Age at initial drinking (years)	15.0 $\pm$ 2.9	12.9 $\pm$ 3.1	2.119	64	0.038
Age at initial use of any kinds of psychoactive drugs (years)	17.3 $\pm$ 5.0	17.4 $\pm$ 6.2	0.038	64	0.971
WURS	46.9 $\pm$ 26.7	65.2 $\pm$ 19.6	2.710	64	0.013
WURS ≥ 46	30 (55.6%)	10 (83.3%)	2.459	1	0.075

MAP, methamphetamine; WURS, Wender Utah Rating Scale.

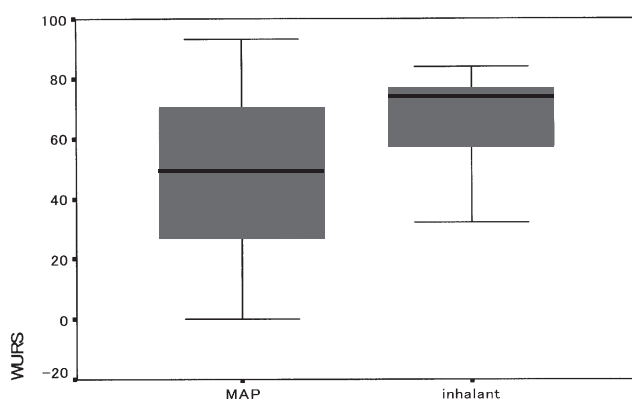


Figure 1. Comparison of Wender Utah Rating Scale (WURS) score.

ADHD in Japanese drug abusers. In the present study, 40 of 66 (60.6%) of both the MAP and inhalant abusers scored >46 , the cut-off for ADHD, on the WURS.⁹ This suggests a relationship between drug abuse and childhood ADHD. Several studies have suggested a similar relationship for ADHD and substance use disorder,¹⁻⁴ such as that half of drug abusers had childhood ADHD,⁴ or ADHD was associated with early onset of alcohol use resulting in increase of risk of drug use.²

In the present study, WURS score was significantly higher in the inhalant abusers than in the MAP abusers, and the inhalant abusers had also begun drinking earlier than the MAP abusers, although both abusers seemed to begin drinking much earlier compared to ordinary adolescents without drug abuse, because only a half of them experienced smoking and drinking at 17 years old.¹⁰ These findings suggest that childhood ADHD was more frequently found in inhalant abusers than in MAP abusers, because the mean WURS score of the inhalant abusers (mean $\pm$ SD; 65.2 ± 19.6) was consistent with that of the subjects with childhood ADHD previously reported (62.2 ± 14.6),⁹ and early onset of alcohol use in inhalant abusers was consistent with the report of Biederman *et al.*² Resnick also supported our findings, noting that some drug abusers with ADHD do not choose stimulants because stimulants cannot make them feel 'high' due to the paradoxical reaction, which is often seen in the individuals with ADHD.¹¹ However, higher education in inhalant abusers was inconsistent with learning disability in childhood ADHD. It is thought that inhalant abusers, mostly consisting of butane abusers, might be considerably less prone to dropping out of school because butane is a legal substance, sold commercially in Japan.

The results of the present study conflicted with our hypothesis that the subjects with childhood ADHD

may prefer stimulant to suppressant. Although we should consider sampling bias because the inhalant abusers were relatively few, if these results are reliable, we can speculate that inhalant abusers with childhood ADHD may have difficulties 'graduating' from the inhalant, or that they may be likely to choose continuing inhalant use, because approximate 70% of the MAP abusers previously experienced inhalant use. In Japan, inhalants were described as a drug that opens a 'gateway' for MAP, inducing stronger dependencies.⁸ Many abusers generally start with inhalants as teenagers, they 'graduate' from inhalant, resulting in progression to MAP abuse or abstinence drugs. Therefore, we suspect that inhalant abusers with childhood ADHD may choose to continue with inhalant use to self-medicate their hyperactivity and irritability with a suppressant.

The present study is preliminary because of several limitations including; (i) small sample size; (ii) no parental information for evaluation of ADHD; and (iii) insufficient life-background information of both types of abusers. Additionally, the validity of our Japanese WURS has not been established. Further study using a large sample is required.

REFERENCES

1. Wilens TE, Mick E, Faraone SV *et al.* Attention deficit hyperactivity disorder (ADHD) is associated with early onset substance use disorders. *J. Nerv. Ment. Dis.* 1997; **185**: 475-482.
2. Biederman JWT, Mick E, Faraone SV *et al.* Does attention-deficit hyperactivity disorder impact the developmental course of drug and alcohol abuse and dependence? *Biol. Psychiatry* 1998; **44**: 269-273.
3. Wilson JJ, Levine FR. Attention deficit hyperactivity disorder (ADHD) and substance use disorders. *Curr. Psychiatry Rep.* 2001; **3**: 497-506.
4. Horner BR. Prevalence and implications of attention-deficit hyperactivity disorder among adolescents in treatment for substance abuse. *J. Am. Acad. Child Adolesc. Psychiatry* 1997; **36**: 30-36.
5. Cocores JA, Mueller PS, Gold MS. Cocaine abuse and adult attention deficit disorder. *J. Clin. Psychiatry* 1987; **48**: 376-377.
6. Carroll KM. History and significance of childhood attention deficit disorder in treatment-seeking cocaine abusers. *Compr. Psychiatry* 1993; **34**: 75-82.
7. Levine FR. Attention-deficit hyperactivity disorder and substance abuse: relationship and implications for treatment. *Harv. Rev. Psychiatry* 1995; **2**: 246-258.
8. Grebermann SB, Wada K. Social and legal factors related to drug abuse in the United States and Japan. *Public Health Rep.* 1994; **109**: 731-737.
9. Ward MF, Wender PH, Reimherr FW. The Wender Utah Rating Scale: an aid in the retrospective diagnosis of

- childhood attention deficit hyperactivity disorder. *Am. J. Psychiatry* 1993; **150**: 885–890.
10. Osaki Y, Minowa M, Suzuki K *et al.* Adolescent smoking behavior in Japan. *Jpn J. Alcohol Drug Depend.* 2003; **38**: 483–491.
11. Resnick RJ. *The Hidden Disorder: A Clinician's Guide to Attention Deficit Hyperactivity Disorder in Adults.* American Psychological Association, Washington, DC, 2000.