

例が激増している。なかには、横紋筋融解症（横紋筋が壊れ、ミオグロビンが血中に溶け出し、それが腎臓の濾過装置をふさいでしまい、結果的に腎不全に陥る致死的病態）に陥るケースも少なくなく、救急施設調査⁽⁷⁾では、搬送患者の一〇％に横紋筋融解症が認められている。また、行政解剖事例では「脱法ハーブ」の使用が死につながったと推定される例が二〇一三年に九例報告されている⁽⁸⁾。二回目の流行期の代表的「脱法ドラッグ」である「MeO-DIPIT」のドパミン神経細胞死惹起濃度はメタンフェタミン（覚せい剤）の約十分の一と強力であった⁽⁹⁾。

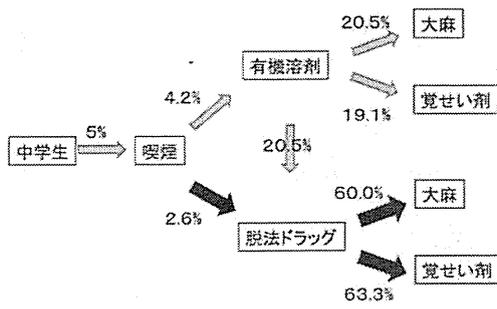
これらのことから、筆者は「脱法ドラッグ」の多くは「薬物」というよりは「毒物」と考えた方が妥当ではないかと考えている。

六 「ゲイトウェイ・ドラッグ」の乱用防止教育

青少年における薬物乱用防止を考える際、「ゲイトウェイ・ドラッグ」という概念が重要である⁽⁸⁾。これは乱用される薬物にはそれなりの順番があり、Aという薬物を乱用するとBというさらに依存性の高い薬物の乱用に進みやすい場合、AはBの「ゲイトウェイ・ドラッグ」であるということになる。

従来、我が国では有機溶剤が覚せい剤へのゲイトウェイ・ドラッグであると考えられてきた。図5は、二〇一二年の「全国中学生調査」⁽³⁾による喫煙、有機溶剤、「脱法ドラッグ」経験者の関係を示している。中学生の五％が喫煙経験者であり、この喫煙経験者の四・二％が有機溶剤乱用を経験しており、有機溶剤経験者の二〇・五％が大麻乱用を経験しており、一九・一％が覚せい剤を経験していることを示している。二〇一二年調査では初めて「脱法ドラッグ」についても調べたわけだが、図5は「脱法ドラッグ」経験者の六〇・〇％が大麻を経験しており、六三・三％が覚せい剤を経験しているというショッキングな結果であった。現時点では、中学生が最も乱用する

図5 有機溶剤乱用と「脱法ドラッグ」乱用経験を持つ意味
（「全国中学生調査（2012年）」⁽³⁾）



薬物は未だに有機溶剤であり（図1）、その結果、大麻や覚せい剤への流れは「脱法ドラッグ」よりも有機溶剤の方が多そうだが（図5）、大麻や覚せい剤との結びつきは「脱法ドラッグ」の方が強そうであることを図5は示している。このことは、今後の「脱法ドラッグ」の広がり次第では、「脱法ドラッグ」の方が大麻や覚せい剤乱用へのゲイトウェイになり得る可能性があることを示唆している。結果的に、薬物乱用防止教育は「脱法ドラッグ」対策を早急に進める必要がある。

従来、薬物乱用防止教育は、「有機溶剤を乱用するところなる」「覚せい剤を乱用するところなる」という薬物ごとによる一対一対応的害教育を基本としてきた。しかし、本稿で論じたように、「脱法ドラッグ」とは法の網をかいくぐった薬物の総称であり、薬理作用的には何が起きても不思議はないというところに特徴がある。したがって、薬物ごとによる一対一対応的害教育は難しい。

しかし、このことは薬物乱用防止教育と言おうか、健康教育の基本と言おうか、生きるための原則を教えることの重要性を示唆しているように思えるのである。要するに、「脱法ドラッグ」とは、害こそあれ、益など期待できない「未知の物質」なのであり、そのような「未知の物質」を摂取してはいけないという、当たり前の視点であり、「得体の知れない物は口にしない」という当たり前のことである。この視点から薬物乱用防止教育を再検討してみてもいいかであろうか。

本稿で紹介した各種疫学データの多くは、厚生労働科学研究費補助金（H23）医薬一般OTR、及びH25医薬一般OTRによる研究成果の一部である。

参考文献

- (1) 「脱法ドラッグ」を含む薬物乱用・依存の実態把握と薬物依存症者の「回復」とその家族に対する支援に関する研究（D915-106）：二〇一四年
- (2) 薬物乱用・依存等の実態把握と薬物依存症者に関する制度的社会資源の現状と課題に関する研究（G1114）：二〇一三年
- (3) 薬物乱用・依存等の実態把握と薬物依存症者に関する制度的社会資源の現状と課題に関する研究（D17-96）：二〇一三年
- (4) 「脱法ドラッグ」を含む薬物乱用・依存の実態把握と薬物依存症者の「回復」とその家族に対する支援に関する研究（D17-94）：二〇一四年
- (5) 『日本アルコール・薬物医学会雑誌』43（2）（2013）：二〇〇八年
- (6) 「脱法ドラッグ」を含む薬物乱用・依存の実態把握と薬物依存症者の「回復」とその家族に対する支援に関する研究（G121-125）：二〇一四年
- (7) FADDA及び脱法ドラッグの神経毒性ならびに精神依存発現メカニズムの解明（D15-24）：二〇一四年
- (8) 『日本アルコール・薬物医学会雑誌』34（D95-106）：一九九九年

教育時報

Educational Bulletin

9

2014

特集 学校における 喫煙・飲酒・薬物乱用防止教育



薬物乱用防止教室(和気町立和気小学校)

- シリーズ ズームアップSchool!
瀬戸内市立牛窓東小学校・県立林野高等学校
- シリーズ もっと知りたい 岡山のこと 世界のこと
ヨハネスブルグ日本人学校から(南アフリカ)

岡山県教育委員会

みんなで学んで かがやく 未来 (「おかやま教育の日」標語)



「おかやま教育の日」11月1日

2014
9

通巻780号

CONTENTS

教育時報

県教育庁教育次長
伊藤 史恵

3 編集点
「里海」随想

国立精神・神経医療研究センター
精神保健研究所 薬物依存研究部長
和田 清

特集

学校における喫煙・飲酒・薬物乱用防止教育

県警察本部刑事部
県教育庁保健体育課
県学校薬剤師会

4 【巻頭論文】「脱法ドラッグ」乱用の急拡大と求められる薬物乱用防止教育の視点

8 【説明①】岡山県における薬物事犯の現状について

【説明②】岡山県における「薬物乱用防止教育」について

【説明③】学校における薬物乱用防止教育～学校薬剤師の活動について～

笠岡市立新山小学校
高梁市立有漢中学校
県立岡山大安寺高等学校
県立岡山大安寺中等教育学校(後期課程)

15 【事例紹介】
○薬物乱用防止教育の取組から
○本校の薬物乱用防止教育の取組
○生徒保健委員会の実践事例

林 雅人・南都 朋哉
富永 美香子

27 ■子どもの声・保護者の声・地域の声
テーマ：「学校における喫煙・飲酒・薬物乱用防止教育」について

江原 知博・永瀬 通子
定久 秀明・青木 正雄

23 ■写真コーナー
写真だより
グラビア “喫煙、飲酒、薬物乱用、ダメ。ゼッタイ。”

長谷川 博之

29 ■随 想
32 ■地域の力を学校へ
～子ども応援人材バンクの活用～①
「子ども応援人材バンク」を活用した取組



高校生「地域ボランティアリーダー」養成研修

瀬戸内市立牛窓東小学校
県立林野高等学校

33 ■ズームアップSchool!②・③
輝く海の見える学校 わくわくする場所
すべては光る 個性の輝き

前原 涼佑・森原 朱音
日向 洋平

35 ■中高生なんでもトーク④
36 ■私の工夫
生徒が問題を解決する喜びを実感できる指導の工夫
～視写を取り入れた学習活動～

小坂 建太

38 ■もっと知りたい 岡山のこと 世界のこと⑤
ヨハネスブルグ(南アフリカ)

40 ■県教委だより

◆創作の広場 岡山市立平井幼稚園 5歳児 みどり組/富山 杏

◆撮点カット 「牛窓オリーブ園から瀬戸内海を望む」土師匠弘

◆写真 「教育時報」編集部外

て、今後求めら
本体育学会保

の「学生による
影響について
教育実習との関
連を調査を実施し、
等では、創造的
示されたことな
ドが育てようと
大学入学資格
ランドにおける
問題を紹介し、
などについて考
慮における保健
は、保健体育
をとして、
関する科目およ
シラバスを分析
員の資質や能
探索的に検討

月25日～29日、
教育に関する
の保健学習に
、日本学校保健
された保健学習
da Seiji氏らの
ge in Japan in
"Guardians"
arding School
が発表され、注

・充実のための
視野に入れて
大会予稿集。

(野津有司)

コラム 薬物乱用の若年化？高齢化？

薬物乱用問題がマスコミで取り上げられる時、当然の前提であるかのように、「薬物乱用は若年化しており…」という枕詞が使われることが多い。

一方、2014年5月、人気歌手A(56歳)が覚せい剤取締法違反で逮捕された後、「中・高年者での覚せい剤乱用が拡大」という見出しがマスコミに登場した。

さて、実際はどのようなのであろうか？

【薬物乱用の若年化？】

図1は、薬物乱用に関する全国中学生調査¹⁾による中学生の違法薬物の生涯経験率の推移を示している。我が国の中学生における違法薬物生涯経験率は確実に低下してきていることがわかる。一方、図2は全国定点調査²⁾によって得られた覚せい剤関連精神障害患者の平均年齢の推移を示している。覚せい剤関連精神障害患者の高齢化が明らかである。さらに、表1は覚せい剤事犯者の年齢構成の推移を示している。29歳以下の割合が年々減少し、逆に40歳以上の者の割合が増加していることが明らかである。

これらのデータは、薬物乱用の高齢化をこそ示唆しても、薬物乱用の若年化を示唆するものではない。薬物乱

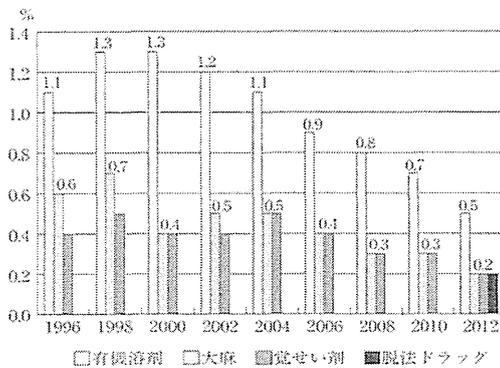


図1 中学生の薬物乱用生涯経験率¹⁾

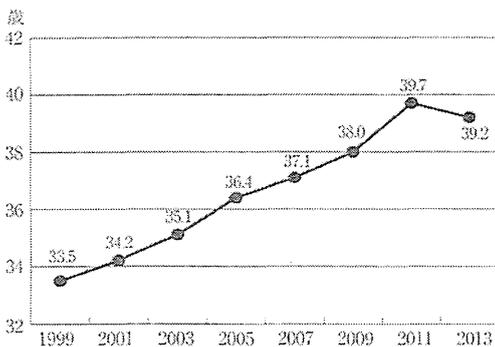


図2 覚せい剤関連患者の平均年齢²⁾

表1 覚せい剤取締法違反検挙者の年齢構成(%)

年	総数(人)	19歳以下	20-24歳	25-29歳	30-39歳	40-49歳	50歳以上
2000	19,156	6.0	16.8	20.1	32.0	14.2	10.8
2004	12,397	3.2	10.7	15.5	38.5	19.7	12.4
2008	11,231	2.3	8.8	13.9	36.9	24.9	13.4
2012	11,842	1.2	5.9	10.8	33.7	30.3	17.9

(出典：厚生労働省「麻薬・覚醒剤行政の概況」)

用は若年化などしていないのである。

【中・高年者での覚せい剤乱用が拡大？】

それでは、図2、表1は「中・高年者での覚せい剤乱用が拡大」していることを示唆しているものであろうか？

「薬物関連精神疾患に関する全国精神科病院調査」³⁾によれば、覚せい剤使用経験者の87%の者は、自身が30歳になる前に、すでに覚せい剤の使用をはじめたのであり、40歳以降に初めて覚せい剤を使いはじめた者は3%に過ぎなかった。一方、覚せい剤事犯者の再犯者率は、20～29歳で39.0%、30～39歳で58.9%、40～49歳で69.7%、50歳以上では79.8%にも上るのである(警察庁刑事局：平成25年の薬物・銃器情勢確定値)。

図2や表1を見る限り、一見、「中・高年者での覚せい剤乱用が拡大？」と、考えたくなるが、図2や表1は、覚せい剤の初回使用年齢を示しているわけではない。実態は20～30歳代に覚せい剤を使いはじめた者たちが、止め切れずに使っているうちに年をとって、年齢とともに捕まる者が増えた結果であるということである。薬物乱用者の高齢化こそあれ、「中・高年者での覚せい剤乱用が拡大」などはないのである。

【物語るのは薬物依存の怖さ】

第2次覚せい剤乱用期での覚せい剤事犯者数のピークは1984年であった。その時、20歳だった事犯者は2014年には50歳になっている。表1は、覚せい剤の依存性が如何に強力かを教えてくれるのである。

「危険ドラッグ」(その本質は「脱法ドラッグ」)問題が一大社会問題化した今日、改めて薬物依存の怖さを教育していく必要がある。

文献

- 1) 和田 清ら：飲酒・喫煙・薬物乱用についての全国中学生意識・実態調査(2012年)。平成25年度厚生労働科学研究費補助金(H23-医薬-一般-014)。研究報告書。pp.14-83, 2013。
- 2) 和田 清ら：薬物乱用・依存者におけるHIV感染と行動のモニタリングに関する調査(2013年)。平成25年度厚生労働科学研究費補助金(H24-エイズ-一般-010)。平成25年度総括・研究報告書。pp.180-199, 2014。
- 3) 尾崎 茂ら：全国の精神科医療施設における薬物関連精神疾患の実態調査。平成20年度厚生労働科学研究費補助金(H19-医薬-一般-025)研究報告書。pp.87-134, 2009。

(和田 清)

【薬物】

子どもの環境と薬物乱用の現状

—16年間にわたる中学生調査からみて—

国立精神・神経医療研究センター 精神保健研究所 薬物依存研究部

和田 清

小児科臨床 別刷

66 : 2013—11



【薬物】

子どもの環境と薬物乱用の現状

—16年間にわたる中学生調査からみて—

国立精神・神経医療研究センター 精神保健研究所 薬物依存研究部 **和田 清** (wada kiyoshi)



KEY WORDS

飲酒
喫煙
薬物乱用
中学生
食事頻度



Kiyoshi Wada

はじめに

わが国の薬物乱用状況は、覚せい剤取締法事犯者数の推移をもとに、3つの流行期に分けて語られてきた。戦後の社会混乱を背景に覚せい剤が乱用された第1次覚せい剤乱用期(1945~1957年)、オイルショックに象徴される実質経済成長率の急落を背景とする第2次覚せい剤乱用期(1970~1994年)、「バブル景気」の崩壊を背景とする第3次覚せい剤乱用期(1995年~)である¹⁾。その意味では、今日も第3次覚せい剤乱用期にあるわけだが、第3次覚せい剤乱用期が始まってからす

で18年が経過しており、この間の薬物乱用・依存状況の変化は著しい。

筆者は、最近の薬物乱用の特徴を以下のようにまとめている。①有機溶剤乱用(「シンナー遊び」)・依存の激減、②覚せい剤乱用・依存の頭打ち、③大麻乱用の確実な浸透、④デザイナードラッグ(ほとんどは「脱法ドラッグ」^{注)})乱用の登場、⑤医薬品乱用の「静かな拡大」であり¹⁾、これらは①有機溶剤優位という「わが国独自型」から、大麻優位という「欧米型」への変化であり、中毒性

注)「脱法ドラッグ」：麻薬や覚せい剤と類似の作用を持ちながらも、化学構造式がそれらとはわずかに異なるために、法規制を逃れることができる薬物で、乱用されることを意図して製造・販売され、実際に乱用されている薬物。

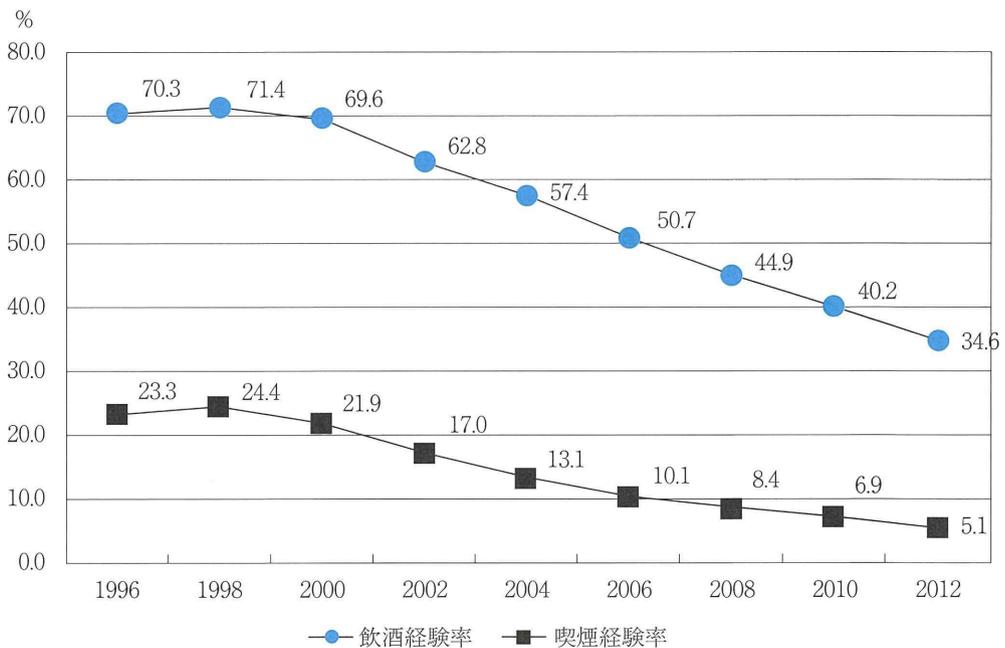


図1 喫煙・飲酒の生涯経験率【中学生】

精神病惹起作用の「弱い」薬物へのシフトであり、使用すると「捕まる薬物」から、使用しても「捕まらない薬物」へのシフトである²⁾。

そして、「捕まる薬物」から、「捕まらない薬物」へのシフトの象徴が、2011年下半期ごろから急激に社会問題化した「脱法ドラッグ」問題であろう³⁾。

しかも、以上の変化は、これまでのわが国では認められたことのないほど劇的な変化であり、本稿では、その変化が子どもの薬物乱用状況と薬物乱用に関係しそうな日常生活にどのような影響を及ぼしてきたのかを考えてみたい。

全国中学生調査からわかること

筆者らは、薬物乱用開始の最頻年齢である中学生に焦点を当てて、1996年以来、「飲酒・喫煙・薬物乱用に関する全国中学生意識・実態調査」を隔年で実施してきた⁴⁾。

1. 飲酒・喫煙・薬物乱用の生涯経験率

図1、図2は、全国の中学生における飲

酒、喫煙、薬物乱用の生涯経験率（これまでに1回でも経験したことがあると答えた者の割合）を示している。飲酒、喫煙、薬物乱用のいずれを見ても、この16年間で、その生涯経験率は確実に減少したことがわかる。1998年に71.4%であった飲酒の生涯経験率は、2012年には34.6%まで激減しており、喫煙のそれは24.4%から5.1%へ激減した。また、1998年には1.3%であった有機溶剤乱用の生涯経験率は、2012年には0.5%にまで減少し、大麻のそれは0.7%から0.2%へ、また、覚せい剤のそれは0.5%から0.2%まで減少した。どれをとっても「好ましい」ことである。

ただし、2012年調査で初めて調べた「脱法ドラッグ」の乱用経験率は、大麻や覚せい剤と同じ0.2%であったが、人数のうえでわずかにそれらをしのぎ、有機溶剤についていきなり第2位であったことは特筆すべき変化である⁴⁾。

2. 社会の変化・家族の変化

筆者は有機溶剤乱用者（特に中学生）の特徴として、①中学生時に開始する者が多い。

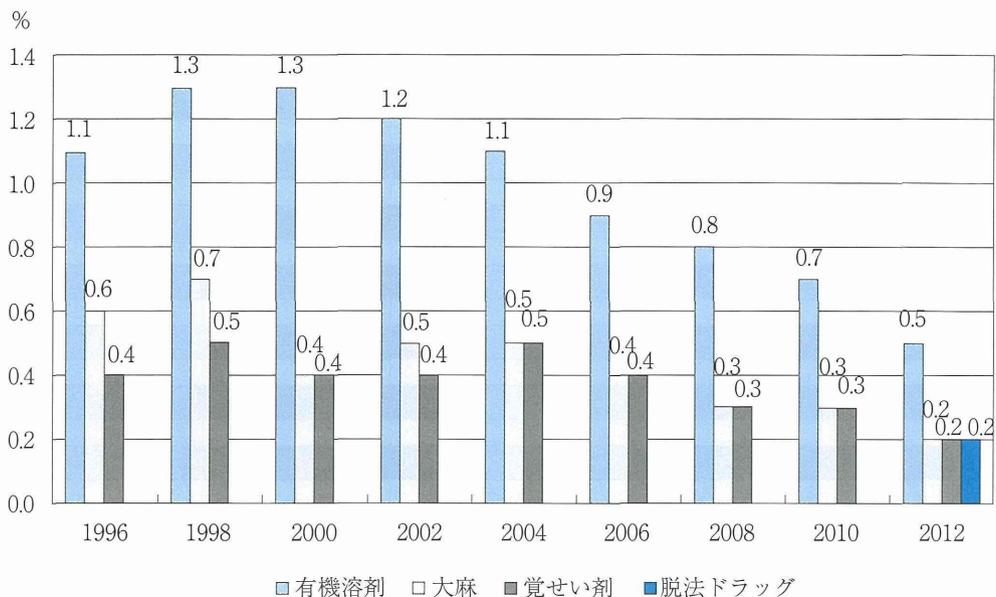


図2 薬物乱用の生涯経験率【中学生】



図3 朝食頻度【中学生】

②日常生活の規則性が乱れている者が多い。
 ③学校への適応も良くない者が多い。④家庭生活もギクシャクしている者が多い。⑤気持ちを話せる友人もないことが多い。を抽出したいと考えている⁵⁾と論じてきたが、1996年以降今日までの社会の変化とこの指摘の普

遍性の一端を紹介したい。

図3は全国中学生調査⁴⁾によって判明したわが国の中学生の朝食摂取率の推移であるが、1998年以降、朝食摂取率が確実に増加してきていることがわかる。また、図4は、同調査によって判明した家族全員での夕食摂取

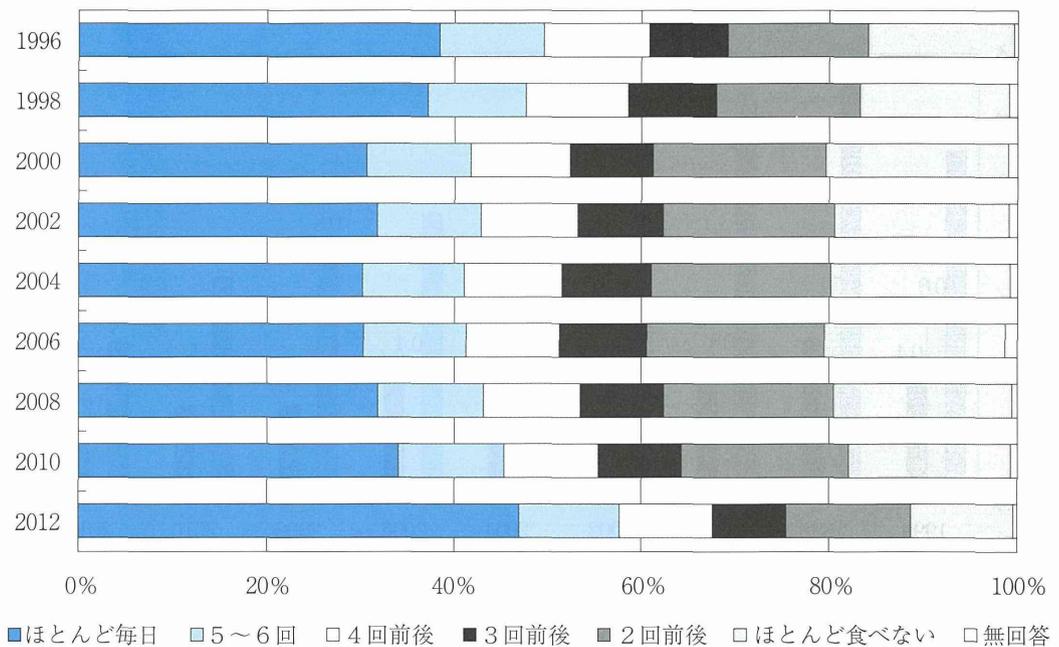


図4 家族全員での夕食頻度（週当たり）〔中学生〕

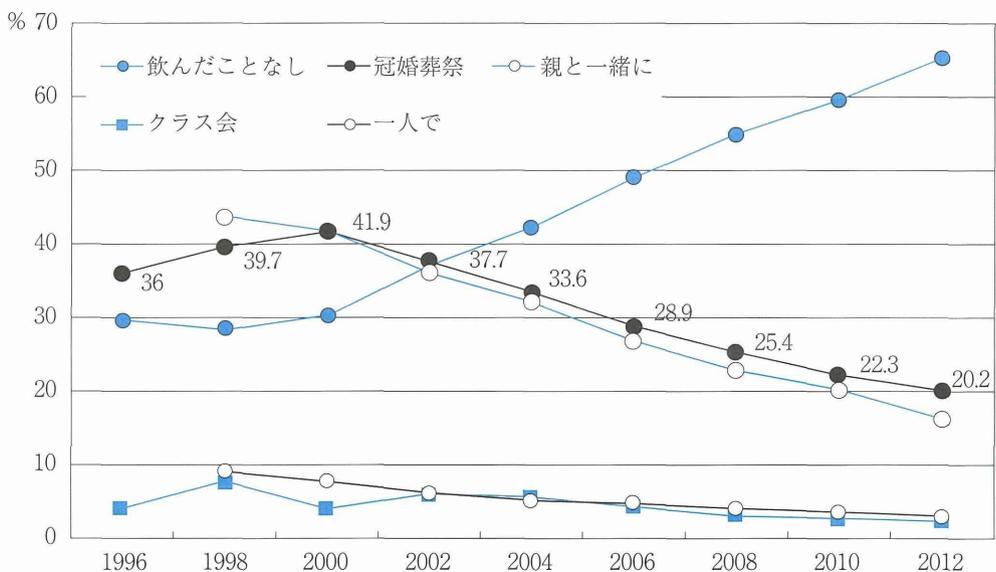


図5 生涯飲酒経験率（飲酒の機会別）〔中学生〕

頻度の推移である。1996年以降、「ほとんど毎日」家族全員で夕食を摂る家族の割合はいったんは減少しながらも、2008年ごろから再び増加に転じ、2012年調査では1996年以降最高の割合となったことがわかる。図3や図4を見る限りは、わが国の中学生の生活背景は好ましい方向へ変化してきているように見え

る。

一方、図5は、全国中学生調査から判明した飲酒の機会別生涯経験率の推移である。わが国には、子どもといえども「冠婚葬祭時」や「親の晩酌時」にはアルコールに口をつけたりする「文化」があったと筆者は考えている⁶⁾。しかし、2000年には41.9%あった「冠

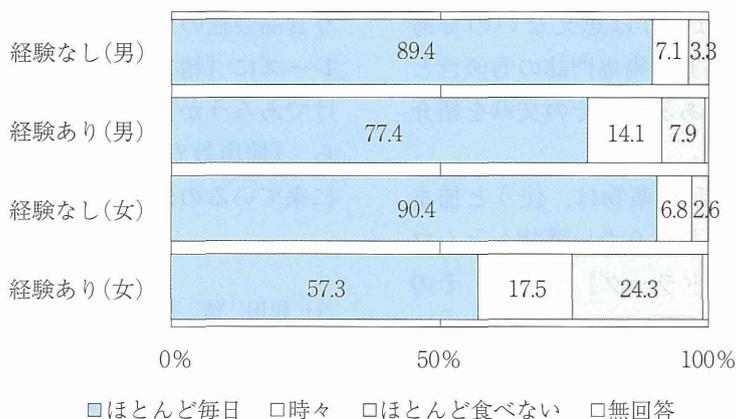


図6 有機溶剤乱用経験別の朝食摂取頻度〔中学生，2012〕

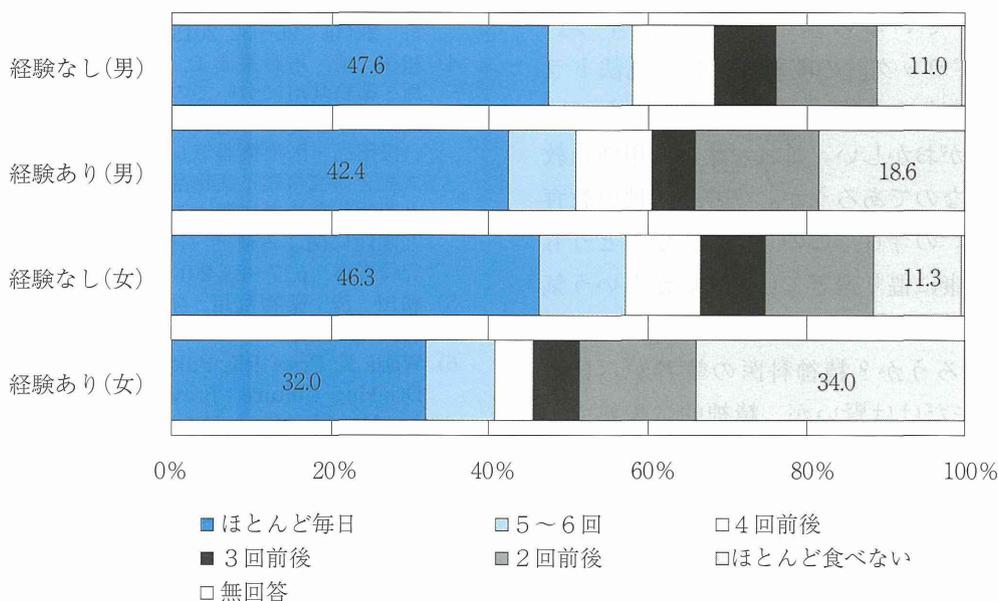


図7 有機溶剤乱用経験別の家族全員での夕食頻度（週当たり）〔中学生，2012〕

「婚葬祭時」での飲酒経験率は，2012年には20.2%にまで低下し，同じく親の晩酌時を含めた「親と一緒に」の時の飲酒経験率が1998年の43.7%から2012年には16.3%まで低下している事実も見ておく必要がある。

要するに，「良い」「悪い」と単純に評価はできないが，この10数年間で，社会が激変し，家族の在り方も激変してきたのである。

ただし，朝食摂取率や家族全員での夕食摂取率を有機溶剤乱用経験の有無で比較すると（図6，図7），有機溶剤乱用経験者群での

朝食摂取率や家族全員での夕食摂取率は時代の変化にかかわらず，明らかに低いままなのである。このことは，有機溶剤乱用者の特徴としてあげたすべてに言えることである⁴⁾。

おわりに —中学生の精神面での健康度は？—

以上のように，中学生の薬物乱用生涯経験率とそれに関連する日常生活を見る限りは，時代は「好ましい」方向に動いているかのように思える。

しかし、筆者にはそうは思えないのである。以下は、筆者が某学術専門誌の巻頭言として書いた文章⁷⁾であるが、その文章を紹介して本稿を閉じたい。

「今日、わが国の乱用薬物は、使うと捕まる薬物から使っても捕まらない薬物へとシフトしている。『脱法ドラッグ』問題は、その流れの中での主流でもある。〈中略〉有機溶剤から始まり覚せい剤に至る時代には、多くの乱用者自身、自己の行為を『悪い』行為だと自覚していた。ところが、最近では、『シンナーは脳が溶けるし、ダサイからやりません。(使っているのは)大麻や『合ドラ』(『合法ドラッグ』の略称。要は『脱法ドラッグ』)だけです。』という若者が増えている。何かがおかしい。これが薬物乱用防止教育の成果なのであろうか。〈中略〉『健康教育全盛時代』の今日、この『健康』が、どうも身体的健康に偏り過ぎてはいまいかという気がし続けるのである。『精神の健康』はどうなのであろうか？精神科医の筆者から見ると、『口先だけは賢いが、精神的に未熟で、ひ弱で、セコイ若者』が増えているようにも思えてならない。〈中略〉今日の日本は、大人も子どもも『生きづらい』。閉塞感で窒息しそうで、居場所もない。かつて『ワンパクでもいい。たくましく育ててほしい。』とい

う食品会社のコマーシャルがあった。このフレーズに『精神の健康』を感じるのは筆者だけであらうか？『精神の健康』という観点から、『健康教育』を根本的に見つめ直す時期に来ているのかもしれない。』

文 献

- 1) 和田 清, 嶋根卓也, 船田正彦: わが国における薬物乱用・依存の最近の特徴. 日本社会精神医学会雑誌 20(4): 407~414, 2011
- 2) 和田 清: 薬物乱用・依存の今日的状況と政策的課題. 日本アルコール・薬物医学会雑誌 43: 120~131, 2008
- 3) 和田 清, 船田正彦, 富山健一他: 脱法ハーブを含む「脱法ドラッグ」乱用とその実態. 精神科 22(1): 26~32, 2013
- 4) 和田 清, 水野菜津美, 嶋根卓也他: 飲酒・喫煙・薬物乱用についての全国中学生意識・実態調査. 平成24年度厚生労働科学研究費補助金(医薬品・医療機器等レギュラトリーサイエンス総合研究事業)薬物乱用・依存等の実態把握と薬物依存症者に関する制度的社会資源の現状と課題に関する研究(H23-医薬-一般-014)研究報告書, p.17~83, 2013
- 5) 和田 清: 薬物乱用. 学校保健研究 47(5): 389~396, 2005
- 6) Wada K, Price RK, Fukui S: Reflecting Adult Drinking Culture: Prevalence of Alcohol Use and Drinking Situations among Japanese Junior High School Students in Japan. Journal of Studies on Alcohol 59(4): 381~386, 1998
- 7) 和田 清: 「精神の健康」はどうなのであろうか?—若者の薬物乱用から見て—. 学校保健研究 54: 109~109, 2012

☆ ☆ ☆ ☆ ☆ ☆

Regular Article

Clinical features of patients with designer-drug-related disorder in Japan: A comparison with patients with methamphetamine- and hypnotic/anxiolytic-related disorders

Toshihiko Matsumoto, MD, PhD,^{1*} Hisateru Tachimori, PhD,² Yuko Tanibuchi, MD, PhD,⁴ Ayumi Takano, MA^{1,3} and Kiyoshi Wada, MD, PhD¹

Departments of ¹Drug Dependence Research, ²Mental Health Administration, National Institute of Mental Health, National Center of Neurology and Psychiatry, ³Department of Psychiatric Nursing, Graduate School of Medicine, The University of Tokyo, Tokyo, and ⁴Department of Psychiatry, Chiba Hospital, Chiba, Japan

Aim: The aim of this study was to clarify the clinical features of designer-drug-abusing patients through comparisons with methamphetamine-abusing patients and hypnotics/anxiolytics-abusing patients.

Methods: Information on 126 designer-drug-abusing patients, 138 methamphetamine-abusing patients, and 87 hypnotics/anxiolytics-abusing patients was extracted from the 2012 database of 'The Nationwide Mental Hospital Survey on Drug-related Psychiatric Disorders' and the clinical variables of designer-drug-abusing patients compared with those of the other two groups.

Results: Multivariate analysis indicated the following significant differences between designer-drug-abusing patients and the other two types of patients: designer-drug-abusing patients were younger, included more men, had higher education and fewer relationships

with antisocial groups, and included more patients meeting ICD-10 F1 sub-classification categories of 'Harmful use' and 'Psychotic disorders' than methamphetamine-abusing patients. Compared with hypnotics/anxiolytics-abusing patients, designer-drug-abusing patients were younger, included more men and more patients meeting criteria for 'Psychotic disorders', and more frequently cited 'peer pressure', 'unable to refuse', and 'seeking stimulation' as reasons for using the drug.

Conclusion: The advent of designer drugs has created a new class of drug abuse, and abuse of designer drugs may carry a strong psychosis-inducing risk, exceeding that of methamphetamine.

Key words: anxiolytics, designer drugs, drug-related disorders, hypnotics, methamphetamine.

RECENTLY, NON-CONTROLLED, 'DESIGNER' drugs have become a social problem in Japan.¹ They are created by partial modifications to the chemical structure of existing illegal drugs, such as

methamphetamine or synthetic narcotics, enabling them to avoid regulation under the law. Particularly notorious among these are drugs commonly known as 'Dappou Herb' (*Dappou* means evasion in Japanese), a product in which the aforementioned designer drugs are mixed with flakes of dried plant material. In addition to these 'herbal' products there are designer drugs known as 'powder/liquid types', which take the form of a powder or liquid, and are sold in shops, such as 'adult shops'/'head shops' and via the Internet.

*Correspondence: Toshihiko Matsumoto, MD, PhD, Department of Drug Dependence Research, National Institute of Mental Health, National Center of Neurology and Psychiatry, 4-1-1 Ogawa-Higashi, Kodaira, Tokyo 187-8553, Japan. Email: tmatsu@ncnp.go.jp
Received 5 August 2013; revised 25 September 2013; accepted 3 November 2013.

Herbal or powder/liquid-type designer drugs have been a serious social problem in the USA since around 2010, where 14.3% of college students are reported to have experienced herbal drug use;² the number of reports of adverse events at Texas addiction centers has risen sharply since 2010;³ and a wide range of health damage has been identified,⁴ from paranoia and aggressive behavior⁵ to seizures and cardiac arrest. Furthermore, with respect to one of the powder-type drugs, called 'Bath salts', reports of cases presenting with schizophrenia-like symptoms have been reported,⁶ and according to one source, they are 'much more dangerous than methamphetamine and cocaine'.⁷

The escalation of designer drug abuse in Japan and the USA is occurring with very little time lag. According to a report from the Japan Poison Information Center,⁸ accounts of adverse events related to designer drugs have increased sharply since 2010. According to the review by Wada *et al.*,⁹ particularly since 2011, media attention has been attracted by car accidents and violence under the influence of designer drugs, neuropsychiatric symptoms, including impaired consciousness, and seizures, and cardiac arrest arising due to acute intoxication. This situation is also reflected in the field of psychiatric care. In the 2012 Nationwide Mental Hospital Survey on Drug-related Psychiatric Disorders (NMH Survey),¹ performed every 2 years, the new category of designer drugs overtook hypnotics/anxiolytics (which had previously been in second place in the 2010 survey) to become second only to methamphetamine.

In a broad sense, the designer-drug problem in Japan has not just emerged recently. During the late 1990s, 'magic mushrooms', containing the psychedelic compound psilocybin, became a problem, and around 2005–2007, 5-methoxy-N, N-diisopropyltryptamine (5-MeO-DIPT), a tryptamine-derivative derived from a serotonin backbone,¹⁰ and phenethylamine-based substances known as the 2C series, such as 2C-T-4 and 2C-T-7,¹¹ emerged. However, abuse of each of these drugs rapidly subsided because of laws and regulations.

However, it is difficult to apply the same measures as previously used in the recent epidemic of designer drugs. Initially, it was believed that herbal designer drugs contained a synthetic cannabinoid similar to the Δ^9 -THC (tetrahydrocannabinol) contained in cannabis and that powder or liquid types contained a cathinone derivative with a similar pharmacological action to methamphetamine (for

example methylenedioxypyrovalerone [MDPV]). However, in actual fact, the structures of these materials are being changed continuously and they contain multiple components with unknown pharmacological actions. Furthermore, it is not uncommon for the components of powder and liquid types to be incorporated into herbal products.¹² Consequently, the same product may have a different component composition depending on the time it was purchased, making it extremely difficult to identify components that should be regulated, to predict clinical symptoms due to ingestion, and to reduce the drug supply by regulation.

Currently there is insufficient information regarding details of health damage caused by designer drugs and the clinical features of abusers, which is necessary to prevent abuse and re-abuse of the designer drugs. We previously compared abusers of designer herbs with abusers of methamphetamine,¹³ historically and consistently Japan's most common drug of abuse.¹⁴ We found that the former had higher educational backgrounds, less likelihood of a criminal record, and more had a history of psychiatric treatment prior to drug use, or were suspected of using drugs with the intention of self-medication.¹⁵ However, a previous survey did not include powder/liquid-type users, and investigations were not made into whether the risk of induced psychosis was higher compared with methamphetamine.

Information regarding the differences and similarities between abusers of designer drugs and hypnotics/anxiolytics that are similarly classified as unregulated drugs is also necessary. We previously established that abusers of hypnotics/anxiolytics tend to include more women, fewer people with criminal records or relationships with antisocial groups, more among the dependence syndrome group and fewer among the psychotic disorders group compared with methamphetamine drug abuse patients. In addition, abusers of hypnotics/anxiolytics are more likely to use drugs with the intention of alleviating the unpleasant symptoms of insomnia and anxiety rather than because of a desire for stimulation or because of peer pressure, as is the case with stimulant abusers.¹³ However, it is unclear whether the same features as these are recognized in abusers of the similarly unregulated designer drugs.

This study emerged from an awareness of the above problem and was conducted with the aim of clarifying the clinical features of patients with designer-drug-related disorder (DDR), by comparing them

with methamphetamine-related disorder (MARD), and hypnotics/anxiolytics-related disorder (HARD), using data from the 2012 NMH Survey. This is the first study to compare the clinical features of DDRD patients with MARD and HARD patients.

METHODS

NMH Survey

Before describing the subjects of this study, an explanation will be given of the details of the subjects and method of the 2012 NMH Survey, the base material for this study.

Surveyed facilities

The 2012 survey included 1609 psychiatric facilities, all of psychiatric hospitals and general hospitals with a psychiatric ward in Japan, consisting of 46 National Hospital Organization hospitals, 136 municipal hospitals, 83 university hospitals and 1344 private psychiatric hospitals.

Subject inclusion criteria

Cases subject to investigation included all drug-related-disorder patients who were admitted to hospital or received outpatient consultations in the 2-month period from September to October 2012 (patients who were diagnosed as the ICD-10 'F1: Mental and behavioral disorders due to psychoactive substance use' category by an attending psychiatrist of each survey facility, except those in which alcohol was the psychoactive substance that had the greatest impact on the clinical problem).

Method of collecting information

A guidance document was sent to all target facilities in advance of the survey. It was displayed in an appropriate location to make it known to patients, in principle, after which information was gathered through semi-structured interviews by the attending psychiatrist. Verbal consent was obtained when conducting interviews but no information was gathered on cases where patients were able to be interviewed but refused to cooperate with the survey, which were recorded as 'refusal to cooperate with the survey', and only a report on applicable numbers was requested. In cases where applicable subjects were minors

(under 20 years), or interviews were problematic because of patients having been discharged from hospital, or being in an unstable medical condition, such as a severe psychotic state, the attending psychiatrist was asked to transcribe information applicable to the survey items from medical records, and in such cases, obtaining informed consent was unnecessary. Questionnaires filled out using the procedure described above were sent by post or fax and were gathered and analyzed under the guidance of the first author. The present study was conducted with the approval of the National Center of Neurology and Psychiatry Ethics Committee.

Survey items

The items were the same as in the previous survey, including population demographics data (sex, age), educational background, employment status, current marital status, antisocial ties or criminal background, lifetime experience of usage of various drugs, status of use within the last year, the current type of 'principal drug', motivation for use, route of acquisition, ICD-10 F1 sub-classification of drug use, and ICD-10 classification of comorbid mental disorders. For each item the attending psychiatrist would make a judgment and answer the questions using information obtained through interviews and previous medical records.

The principal drug was defined as the drug of abuse that was considered to have the greatest impact on the clinical problem, such as a psychosis or dependence, by the attending psychiatrist. The following categories were established: methamphetamine; organic solvents; cannabis; cocaine; heroin; 3,4-methylenedioxy-N-methylamphetamine (MDMA); psychedelic agents other than MDMA; designer drugs; hypnotics/anxiolytics; analgesics; antitussives; Ritalin; other; and multi-agent. The multi-agent category was selected if multiple drugs were exerting comparable influences on the clinical problem being treated.

Drug-related disorder cases collected in the NMH Survey

Replies were obtained from 1136 of the 1609 target facilities (70.6%) in 2012. The number of cases of drug-related disorder consultations or hospitalizations reported during the survey implementation period was 1161, and information was collected from 877 cases from which consent to cooperate with the

interview study was obtained. However, information relating to sex, age or principal drug was missing in 29 cases, and the remaining 848 cases (602 men, 246 women: average age [SD], 38.3 [12.2] years) became the drug-related disorder cases for the NMH Survey.

Subject of the present study

For the present study, 138 cases in which a designer drug was the principal drug (DDRD), 356 cases in which methamphetamine was the principal drug (MARD), and 128 cases in which a hypnotics/anxiolytics was the principal drug (HARD) were extracted from among the drug-related disorder cases in the 2012 NMH Survey described above. Patients reporting use of the principal drug within the last year (in the case of hypnotics/anxiolytics, abuse or improper use) were selected from among these three drug-related-disorder groups. This was done to reduce the recall bias regarding survey items as much as possible, in order to reflect the reality of drug abuse in recent years. The resulting 137 DDRD cases, 158 MARD cases, and 115 HARD cases were selected as target candidates. Cases in which no data were missing relating to all of the variables used in the analysis, which will be described later, were 126 DDRD cases (91.9%), 138 MARD cases (87.3%) and 86 HARD cases (74.8%). These cases formed the three study groups and were the object of the final analysis.

Variables used for analysis

Variables identified in a prior study as being effective in distinguishing between DDRD patients and MARD patients,¹² and HARD patients and MARD patients,¹³ were used from the information gathered in the NMH Survey for this study.

Demographic variables

Demographic variables included the age and sex of subjects.

Lifestyle-related variables

Lifestyle-related variables included educational background (high school dropout or below, high school graduate or above), and existence of ties to antisocial groups.

Reason for drug use

Information was collected in the NMH Survey regarding the reason for using the principal drug, using 11 categories, with multiple answers allowed. The categories were: (i) 'peer pressure/unable to refuse'; (ii) 'seeking stimulation or out of curiosity'; (iii) 'out of desperation'; (iv) 'seeking arousal'; (v) 'alleviation of fatigue'; (vi) 'seeking sexual effects'; (vii) 'stress relief'; (viii) 'alleviation of depression'; (ix) 'alleviation of anxiety'; (x) 'alleviation of insomnia'; and (xi) 'to lose weight'. For this study, we used information relating to four categories that were found to differ significantly between HARD patients and MARD patients in a previous study:¹³ 'peer pressure/unable to refuse', 'seeking stimulation or out of curiosity', 'alleviation of anxiety' and 'alleviation of insomnia'.

ICD-10 F1 diagnosis sub-classification

Of the F1 sub-classification categories (F1x.0 Acute intoxication through F1x.8 Other mental and behavioral disorders), the four categories that are considered to be the most commonly encountered drug-related disorders clinically ('F1x.0 Acute intoxication', 'F1x.1 Harmful use', 'F1x.2 Dependence syndrome', and 'F1x.5 Psychotic disorder') were used for each case collected in the NMH Survey, as an index to reflect the major clinical condition of cases.

Statistical analysis

Bivariate and multivariate analysis were performed by multinomial logistic regression analysis using the three categories of DDRD group, MARD group, and HARD group as dependent variables, and the demographic variables, lifestyle-related variables, reason for use, and ICD-10 F1 sub-classifications diagnosed by the attending psychiatrist of each survey facilities as independent variables. SPSS 17.0 (IBM, Chicago, IL, USA) for Windows was used for statistical analysis and a level of less than 5% in the two-sided test in the analysis of either was considered significant.

RESULTS

Before presenting results of bivariate and multivariate analyses, the average ages and sex ratios, and the proportions of the lifestyle-related and psychiatric variables of the DDRD, MARD and HARD groups are shown in Table 1.

Table 1. Average ages and sex ratios, and the proportions of the lifestyle-related and psychiatric variables in the DDRD, MARD and HARD groups

			Group according to primary drug		
			DDRD n = 126	MARD n = 138	HARD n = 86
Demographic variables	Age	Average	27.9	39.3	37.6
		SD	7.9	10.6	14.1
	Sex (male)	Frequency	114	98	36
%		90.5%	71.0%	41.9%	
Lifestyle-related variables	Education (High school dropout or below)	Frequency	40	87	18
		%	31.7%	63.0%	20.9%
	Relationship with antisocial group	Frequency	9	69	6
		%	7.1%	50.0%	7.0%
Reason for drug use	Peer pressure/unable to refuse	Frequency	24	32	1
		%	19.0%	23.2%	1.2%
	Seeking stimulation or out of curiosity	Frequency	63	56	3
		%	50.0%	40.6%	3.5%
	Alleviation of anxiety	Frequency	21	17	55
		%	16.7%	12.3%	64.0%
Alleviation of insomnia	Frequency	9	3	48	
	%	7.1%	2.2%	55.8%	
ICD-10 F1 diagnosis sub-classification	F1x. 0 Acute intoxication	Frequency	21	7	7
		%	16.7%	5.1%	8.1%
	F1x. 1 Harmful use	Frequency	21	4	22
		%	16.7%	2.9%	25.6%
	F1x. 2 Dependence syndrome	Frequency	74	85	62
		%	58.7%	61.6%	72.1%
	F1x. 5 Psychotic disorder	Frequency	57	47	3
		%	45.2%	34.1%	3.5%

DDRD, designer-drug-related disorder; HARD, hypnotics/anxiolytics-related disorder; MARD, methamphetamine-related disorder.

Table 2 shows the results of bivariate and multivariate analysis by multinomial logistic regression analysis. This table, in which the DDRD group was set as the reference category, shows the adjusted odds ratio of independent variables and 95% confidence interval to clarify differences with MARD and HARD groups.

First, the following independent variables that affect the distinction between DDRD and MARD groups significantly were extracted in the bivariate analysis: age ($P < 0.001$: adjusted odds ratio [95% confidence interval], 1.13 [1.10–1.17]); sex ($P < 0.001$: 0.25 [0.13–0.48]); educational background ($P < 0.001$: 3.74 [2.27–6.17]); relationships with antisocial groups ($P < 0.001$: 12.18 [5.94–24.96]); reason for drug use/seeking stimulation or

out of curiosity' ($P = 0.048$: 0.62 [0.39–1.00]); F1x.0 Acute intoxication ($P = 0.002$: 0.25 [0.10–0.60]); F1x.1 Harmful use ($P < 0.001$: 0.13 [0.04–0.39]); and F1x.5 Psychotic disorder ($P = 0.043$: 0.61 [0.38–0.98]).

Independent variables that affected the distinction between the HARD and DDRD groups were: age ($P < 0.001$: 1.13 [1.09–1.17]); sex ($P < 0.001$: 0.07 [0.04–0.14]); educational background ($P = 0.048$: 0.053 [0.28–1.00]); reason for drug use/peer pressure, unable to refuse' ($P = 0.001$: 0.04 [0.00–0.28]); reason for drug use/seeking stimulation or out of curiosity' ($P < 0.001$: 0.03 [0.01–0.09]); reason for drug use/alleviation of anxiety' ($P < 0.001$: 9.25 [5.08–16.84]); reason for drug use/alleviation of insomnia' ($P < 0.001$: 19.85 [9.18–42.91]); F1x.0

Table 2. Results of multinomial logistic regression analysis on the characteristics of DDRD, MARD and HARD groups

Primary drug [†]	Independent variable	Bivariate						Multivariate					
		B	Wald	P	Adjusted OR	95%CI		B	Wald	P	Adjusted OR	95%CI	
						Lower limit	Upper limit					Lower limit	Upper limit
MARD n = 138	Intercept	-	-	-	-	-	-	-3.02	11.46	0.001	-	-	-
	Age	0.13	64.07	<0.001	1.13	1.10	1.17	0.15	39.62	<0.001	1.17	1.11	1.22
	Sex (male) [‡]	-1.40	16.90	<0.001	0.25	0.13	0.48	-2.51	23.11	<0.001	0.08	0.03	0.23
	Education (High school dropout or below) [§]	1.32	26.70	<0.001	3.74	2.27	6.17	1.30	11.20	0.001	3.66	1.71	7.83
	Relationship with antisocial group [¶]	2.50	46.64	<0.001	12.18	5.94	24.96	2.33	22.09	<0.001	10.22	3.88	26.95
	Reason for drug use/Peer pressure, unable to refuse [¶]	0.22	0.57	0.450	1.25	0.70	2.20	0.34	0.40	0.525	1.41	0.49	4.07
	Reason for drug use/Seeking stimulation or out of curiosity [¶]	-0.47	3.90	0.048	0.62	0.39	1.00	-0.70	3.04	0.081	0.50	0.22	1.09
	Reason for drug use/Alleviation of anxiety [¶]	-0.38	1.21	0.271	0.68	0.34	1.35	-0.39	0.57	0.451	0.68	0.24	1.88
	Reason for drug use/Alleviation of insomnia [¶]	-1.27	3.52	0.061	0.28	0.07	1.06	-1.46	2.43	0.119	0.23	0.04	1.46
	F1x. 0 Acute intoxication [¶]	-1.40	9.58	0.002	0.25	0.10	0.60	-0.52	0.81	0.367	0.59	0.19	1.85
	F1x. 1 Harmful use [¶]	-2.03	13.35	<0.001	0.13	0.04	0.39	-2.26	8.51	0.004	0.11	0.02	0.48
	F1x. 2 Dependence syndrome [¶]	0.01	0.00	0.956	1.01	0.64	1.62	-0.14	0.12	0.732	0.87	0.38	1.97
	F1x. 5 Psychotic disorder [¶]	-0.49	4.10	0.043	0.61	0.38	0.98	-0.82	4.05	0.044	0.44	0.20	0.98
HARD n = 86	Intercept	-	-	-	-	-	-	-3.22	6.77	0.009	-	-	-
	Age	0.12	56.97	<0.001	1.13	1.09	1.17	0.14	22.344	<0.001	1.15	1.08	1.22
	Sex (male) [‡]	-2.66	58.41	<0.001	0.07	0.04	0.14	-2.94	23.32	<0.001	0.05	0.02	0.17
	Education (High school dropout or below) [§]	-0.64	3.91	0.048	0.53	0.28	1.00	0.20	0.12	0.727	1.22	0.40	3.73
	Relationship with antisocial groups [¶]	-0.36	0.44	0.505	0.70	0.25	1.99	-0.37	0.18	0.669	0.69	0.13	3.73
	Reason for drug use/Peer pressure, unable to refuse [¶]	-3.28	10.22	0.001	0.04	0.00	0.28	-3.28	4.05	0.044	0.04	0.00	0.92
	Reason for drug use/Seeking stimulation or out of curiosity [¶]	-3.58	34.43	<0.001	0.03	0.01	0.09	-2.60	10.16	0.001	0.07	0.02	0.37
	Reason for drug use/Alleviation of anxiety [¶]	2.22	52.99	<0.001	9.25	5.08	16.84	1.35	6.11	0.013	3.86	1.32	11.28
	Reason for drug use/Alleviation of insomnia [¶]	2.99	57.73	<0.001	19.85	9.18	42.91	2.42	10.14	0.001	11.20	2.53	49.58
	F1x. 0 Acute intoxication [¶]	-0.93	4.59	0.032	0.39	0.17	0.92	-0.31	0.17	0.678	0.73	0.17	3.17
	F1x. 1 Harmful use [¶]	0.83	7.38	0.007	2.29	1.26	4.16	0.76	0.74	0.390	2.15	0.38	12.22
	F1x. 2 Dependence syndrome [¶]	0.35	1.80	0.179	1.43	0.85	2.39	0.82	1.29	0.255	2.27	0.55	9.30
	F1x. 5 Psychotic disorder [¶]	-3.36	30.38	<0.001	0.03	0.01	0.11	-3.02	11.91	0.001	0.05	0.01	0.27

Bold characters indicate a significance probability of less than 0.05.
[†]Reference category is DDRD (n = 126). [‡]Reference category is female. [§]Reference category is high school graduate or above. [¶]Reference category is not applicable.
 CI, confidence interval; DDRD, designer-drug-related disorder; HARD, hypnotics/anxiolytics-related disorder; MARD, methamphetamine-related disorder; OR, odds ratio.

Acute intoxication ($P = 0.032$: 0.39 [0.17–0.92]); F1x.1 Harmful use ($P = 0.007$: 2.29 [1.26–4.16]); and F1x.5 Psychotic disorder ($P < 0.001$: 0.03 [0.01–0.11]).

In multivariate analysis, independent variables that affected the distinction between the MARD and DDRD groups were: age ($P < 0.001$: 1.17 [1.11–1.22]); sex ($P < 0.001$: 0.08 [0.03–0.23]); educational

background ($P = 0.001$: 3.66 [1.71–7.85]); relationships with antisocial groups ($P < 0.001$: 10.22 [3.88–26.95]); F1x.1 Harmful use ($P = 0.004$: 0.11 [0.02–0.48]); and F1x.5 Psychotic disorder ($P = 0.044$: 0.44 [0.20–0.98]). These results show that, compared with the DDRD group, the MARD group has a significantly higher age, has more women, lower educational background, more subjects with

ties to antisocial groups and fewer who apply to the F1 diagnosis sub-classifications Harmful use and Psychotic disorder.

On the other hand, the independent variables that significantly affected the distinction between HARD and DDRD groups were: age ($P < 0.001$: 1.15 [1.08–1.22]); sex ($P < 0.001$: 0.05 [0.02–0.17]); reason for drug use/‘peer pressure, unable to refuse’ ($P = 0.044$: 0.04 [0.00–0.92]); reason for drug use/‘seeking stimulation’ ($P = 0.001$: 0.07 [0.02–0.37]); reason for drug use/‘alleviation of anxiety’ ($P = 0.013$: 3.86 [1.32–11.28]); reason for drug use/‘alleviation of insomnia’ ($P = 0.001$: 11.20 [2.53–49.58]); and F1x.5 Psychotic disorder ($P = 0.001$: 0.05 [0.01–0.27]). These results show that, compared with the DDRD group, the HARD group had a significantly higher age, more women, fewer who cited the reason for drug use as ‘peer pressure, unable to refuse’ or ‘seeking stimulation’, more who cited the reason for drug use as ‘alleviation of anxiety’ or ‘alleviation of insomnia’, and fewer who applied to the F1 diagnosis sub-classification of Psychotic disorder.

DISCUSSION

In this study we investigated the clinical features of DDRD patients through comparisons with MARD patients, who are historically and consistently the largest group of drug abusers in Japan, and HARD patients, who, like DDRD patients, fall outside the scope of the law. Results of multivariate analysis demonstrated that DDRD patients have characteristics that differ in several respects from MARD and HARD patients.

At first, DDRD patients were younger than both MARD and HARD patients and the proportion of men was higher. This study has also confirmed our previous report¹³ that the proportion of men was overwhelmingly higher among MARD than HARD patients. However, the proportion of men was even higher among the DDRD patients than the MARD patients. This study also confirmed that the educational background of DDRD patients was higher and the relationships with antisocial groups lower than MARD patients and, as such, this type of lifestyle background has more in common with HARD patients. These findings are consistent with our previous study.¹³ The above suggests the possibility that designer-drug abuse has spread from the center of a class with a relatively general lifestyle background of young men who are also not antisocial. This may

mean that the advent of designer drugs has created a new class of drug abuse.

This study also confirmed that DDRD patients use drugs not with the intent to self-medicate to ‘alleviate the unpleasant symptoms of anxiety or insomnia’ but for the purpose of ‘seeking stimulation or pleasure’ or because of ‘peer pressure’. This shows that even among similarly unregulated drugs, designer-drug abusers and abusers of essentially therapeutic hypnotics/anxiolytic agents differ in their motive or reason for drug use. Although we may be required to consider that DDRD patients use drugs for the same reasons as MARD patients, this is inconsistent with our supposition in the previous study.¹² Our previous study demonstrated that the high number of *Dappou*-Herb-related disorder patients had a history of psychiatric treatment prior to the start of drug use, compared with the MARD patients, and from this finding, we speculated that the motive for drug use might be a type of ‘self-medication’¹⁵ intent for the symptoms of the antecedent mental disorder.¹² It is inferred that this inconsistency is due to the differences in the objects of investigation in the two studies. In our previous study, the subjects were outpatients, most of whom received consultations voluntarily. In contrast, the subjects of the present study were drug-related disorder patients who consulted as outpatients or were hospitalized at psychiatric care units nationwide, and included patients who received hospital treatment for psychotic disorders involuntarily. In that sense, findings from the previous study were targeted at a particular group among drug-related disorder patients and it is possible that the results of this study better reflect the general trend of DDRD patients.

The present study also confirmed the characteristics that more DDRD patients fall under the category of psychotic disorders than either MARD or HARD patients. These results would appear to include important implications concerning the psychosis-inducing risk of designer drugs. The existence of more DDRD patients in the psychotic disorders category compared with HARD patients has been regarded as natural considering the pharmacological effects of hypnotics/anxiolytics, but unexpectedly, more DDRD patients fall within the psychotic disorders category than MARD patients, who conventionally use substances that possess strong psychosis-inducing effects. The following two possibilities can be considered as an explanation for this.

One explanation is the possibility that designer drugs have a strong psychosis-inducing risk surpass-

ing that of methamphetamine. An indication that designer drugs are more dangerous than methamphetamine and cocaine in the USA⁸ can be considered as supporting evidence, as was mentioned above. Another possibility is that the DDRD group is prone to include more patients who fall within the psychotic disorders category because, in the case of designer drugs, unlike the illegal drug methamphetamine, simply using the drug is not easily recognized but when obvious psychiatric symptoms occur, it is recognized. At this point, it is difficult to judge which of these possibilities is more valid. This study was based on a survey of abusers who accessed psychiatric care. Furthermore, components of designer drugs differ in various ways depending on the product, and there is insufficient knowledge regarding the substances that are responsible for causing psychiatric symptoms. There is therefore insufficient supplementary information to draw conclusions.

This study also found that the ratio of DDRD patients falling within the dependence syndrome category did not differ from MARD or HARD patients. This result showed that designer drugs, like methamphetamine and hypnotics/anxiolytics, carry a risk of only causing dependence syndrome. In addition, a higher ratio of DDRD patients fell within the harmful use category than MARD patients. If the concept of 'harmful use' in the ICD-10 is, in principle, considered to be a mutually exclusive diagnosis category to dependence syndrome, this result may suggest that even in the case of a mode of use that does not reach the level of dependence syndrome, it has the potential to cause such health damage as psychotic disorders.

In recent years, there has been much in the news relating to accidents caused by reckless driving, violence or self-harm and suicide under the influence of designer drugs. One can observe from simply watching these reports that designer drugs have a serious impact on the behavior and mental state of a drug user, and this study has significance in that it proves scientifically one part of this. The Ministry of Health, Labor, and Welfare is already implementing comprehensive regulations and other strengthening crack-down measures to deal with this type of situation but from the clinical experience of the authors, which shows that large numbers of DDRD patients continue to consult at specialist outpatient drug dependence centers, it is difficult to say that there is any visible effect, at least at this point. It can be said that in addition to a review of regulatory methods,

the provision of a treatment system is a pressing issue.

There are several limitations to this study but the major ones are the following four. First, the subjects of this study were drug-related-disorder patients who consulted as outpatients or were hospitalized at psychiatric units, and do not reflect the characteristics of all the drug abusers in the community. Therefore, caution is required in generalizing the results of the present study. Second, the information used in the analysis was collected by the psychiatrist in charge of treatment of drug-related disorder patients in each survey facility. Therefore, there is a possibility of variation in judgment criteria among individual psychiatrists. We also cannot exclude the possibilities that patient reporting bias is also present at the treatment site, and that only limited information was collected in case of patients' refusing to cooperate in this survey. Third, in this study all three types of herbal-, powder-, and liquid-based drugs were treated together as designer drugs, but because of the various differences in the component contents, there is a problem with the validity of grouping them together in this way. Finally, to create an appropriate multivariate analysis model, we narrowed down to a minimum the variables of interest for analysis, and as a result, analysis of relations to the variables, such as those relating to alcohol-related disorder and other comorbid disorders, family background, and employment status were not carried out.

Despite the limitations described above, this study has important clinical and social significance. It is the first study to compare the clinical features of abusers of designer drugs, which have become a problem in recent years in Japan, with abusers of methamphetamine, historically and consistently a problematic drug of abuse in Japan, and with abusers of hypnotic/anxiolytics drugs, which share a common feature with designer drugs, that of being unregulated under the law.

Conclusion

The 2012 NMH Survey database was used to investigate the clinical features of DDRD patients through comparisons with MARD and HARD patients for this study. The DDRD group tended to be younger and included more men than the MARD and HARD groups. Furthermore, while DDRD patients had more in common with HARD patients with respect to lifestyle background, they had more in common

with MARD patients with respect to the reason for drug use.

In addition, more DDRD patients than MARD patients fell within the ICD-10 F1 diagnosis code for psychotic disorders and harmful use, and it is speculated that designer drugs pose a strong risk of induced psychosis. In conclusion, designer drugs may have created a new young drug abuse subculture in Japan. It is feared that these drugs may also carry a strong psychosis-inducing risk, exceeding that of methamphetamine. We believe that emergency measures aimed at preventing the abuse or the re-abuse of designer drugs are necessary.

ACKNOWLEDGMENTS

This study has been supported by the Health Labour Research Grant by the Ministry of Health and Welfare, Research on Pharmaceutical and Medical Regulatory Science (Principal Investigator, K. Wada). We declare that we have no conflicts of interest in relation to this study.

REFERENCES

1. Matsumoto T, Tanibuchi Y, Takano A, Kobayashi O, Wada K. A nationwide survey of drug-related psychiatric illness in hospitals with psychiatric inpatient units. The Research Report of 2012 Health Labour Sciences Research Grant (Research on Regulatory Science of Pharmaceuticals and Medical Devices) from the Ministry of Health, Labour and Welfare of Japan, pp. 111–144, 2013 (in Japanese).
2. Stogner JM, Miller BL. Investigating the 'bath salt' panic: The rarity of synthetic cathinone use among students in the United States. *Drug Alcohol Rev.* 2013; 32: 545–549.
3. Forrester MB, Kleinschmidt K, Schwarz E, Young A. Synthetic cannabinoid and marijuana exposures reported to poison centers. *Hum. Exp. Toxicol.* 2012; 31: 1006–1011.
4. Hoyte CO, Jacob J, Monte AA, Al-Jumaan M, Bronstein AC, Heard KJ. A characterization of synthetic cannabinoid exposures reported to the National Poison Data System in 2010. *Ann. Emerg. Med.* 2012; 60: 435–438.
5. McGuinness TM, Newell D. Risky recreation: Synthetic cannabinoids have dangerous effects. *J. Psychosoc. Nurs. Ment. Health Serv.* 2012; 50: 16–18.
6. Kasick DP, McKnight CA, Klisovic E. 'Bath salt' ingestion leading to severe intoxication delirium: Two cases and a brief review of the emergence of mephedrone use. *Am. J. Drug Alcohol Abuse* 2012; 38: 176–180.
7. Slomski A. A trip on 'bath salts' is cheaper than meth or cocaine but much more dangerous. *JAMA* 2012; 308: 2445–2447.
8. Kuroki Y, Iida K, Takeuchi A *et al.* A research on the acute intoxication cases by the 'Gouhou Herb,' of which information were reported to the Japan Poison Information Center. *Jpn. J. Clin. Toxicol.* 2011; 24: 323–327 (in Japanese).
9. Wada K, Funada M, Tomiyama K, Aoo N. Current situation of abuse of designer drugs including the 'Dappou Herb' in Japan. *Nippon Yakuzai-shi-kai Zasshi* 2013; 65: 13–17 (in Japanese).
10. Matsumoto T, Okada T. Designer drugs as a cause of homicide. *Addiction* 2006; 101: 1666–1667.
11. Miyajima M, Matsumoto T, Ito S. 2C-T-4 intoxication: Acute psychosis caused by a designer drug. *Psychiatry Clin. Neurosci.* 2008; 62: 243.
12. Tanibuchi Y, Matsumoto T, Kobayashi O, Wada K. Clinical characteristics of 'dappou herb' use-disorder patients at the drug dependence clinic: A comparison with methamphetamine use-disorder patients. *Seishin Shinkeigaku Zasshi (Psychiatria et Neurologia Japonica)* 2013; 115: 463–476 (in Japanese).
13. Matsumoto T, Ozaki S, Kobayashi O, Wada K. Current situation and clinical characteristics of sedative-related disorder patients in Japan: A comparison with methamphetamine-related disorder patients. *Seishin Shinkeigaku Zasshi (Psychiatria et Neurologia Japonica)* 2011; 113: 1184–1198 (in Japanese).
14. Matsumoto T, Kamijo A, Miyakawa T *et al.* Methamphetamine in Japan: The consequences of methamphetamine abuse as a function of route of administration. *Addiction* 2002; 97: 809–817.
15. Khantzian EK. Self-regulation and self-medication factors in alcoholism and the addictions: Similarities and differences. In: Galanter M (ed.). *Recent Developments in Alcoholism*. Plenum, New York, 1990; 251–277.