

Poppers: an emerging drug. Results from the Drugs Information Reporting System

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Original article

SUMMARY

Introduction

According to the results of the Drug Information Reporting System (SRID for its acronym in Spanish), the first reports about the use of poppers in Mexico City date from 1988. The consumption of poppers has gradually increased through the years.

Objective

Given that one of the purposes of the SRID is to identify new drugs and areas that require further investigation, a descriptive study was performed to determine the characteristics associated with the consumption of poppers.

Materials and methods

To evaluate the use of poppers, data collected by the Drugs Information Reporting System during the period 2000-2012 was analyzed, as well as the trends in use over 24 years. The instrument used is the "Individual Report on Consumption of Drugs", which is applied in Federal District health and justice institutions during the months of June and November each year.

Results

The most relevant results around poppers consumption occurs in adolescents aged 15-19 and young adults aged 20-24. Other notable data are the ages of first use of this substance, and the frequency with which it is consumed.

Conclusions

From the results, it is necessary to propose lines of research that reveal the use of poppers in young people.

Key words: Amyl nitrite, reporting system on drugs, inhalants.

RESUMEN

Introducción

En la Ciudad de México, de acuerdo con los resultados del Sistema de Reporte de Información en Drogas SRID, los primeros reportes del uso de *poppers* datan de 1988 y paulatinamente ha ido incrementado su consumo.

Objetivo

Dado que una de las finalidades del SRID es identificar nuevas drogas y áreas que requieren investigación más detallada, se realizará un estudio descriptivo a fin de conocer las características asociadas a su consumo.

Material y método

Para evaluar el consumo de *poppers* se analizaron los datos recopilados por el Sistema de Reporte de Información en Drogas durante el periodo 2000-2012; así como las tendencias de uso durante 24 años. El instrumento utilizado es la Cédula "Informe Individual sobre Consumo de Drogas" que se aplica en Instituciones de Salud y de Justicia del Distrito Federal durante los meses de junio y noviembre de cada año.

Resultados

Entre los resultados más relevantes se destaca que el consumo de *poppers* se presenta en el grupo de adolescentes de 15 a 19 y en los adultos jóvenes de 20 a 24 años. Otro de los datos sobresalientes son las edades de inicio del consumo de esta sustancia, así como la frecuencia con la que se consume.

Conclusiones

A partir de los resultados encontrados, es necesario plantear líneas de investigación que permitan conocer el consumo de esta sustancia en población joven.

Palabras clave: Amil nitrito, sistema de reporte, inhalables.

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INTRODUCTION

The consumption of inhalants is a public health problem that affects a high percentage of the Mexican population. In accordance with the report by the National Survey on Addictions 2011, the consumption of these substances in the general population aged 12-65 has increased by 0.5% in 2002 to 0.7% in 2008, and 0.9% in 2011.¹

In the Federal District of Mexico, the Drug Consumption Survey in Students of Mexico City 2012 indicated that the prevalence of inhalants use was 10.0%. On the other hand, the System for Epidemiological Vigilance on Addictions 2011 showed that 8.5% of the population who attended for treatment did so due to consumption of inhalants as an impact drug.² Of 3,267 cases admitted for the first time in Juvenile Integration Centers (CIJ for their acronym in Spanish) during the first quarter of 2012, 53% reported consumption of inhalants.³

In accordance with data from the Drugs Information Reporting System (SRID) which estimates trends in substance use in health and justice institutions of the Federal District and Metropolitan Areas^{4,5} it was found that during the assessment made in June 2012, of the 1,256 users admitted to the participating institutions, 38.9% had taken inhalants at some time in their lives.⁶

Inhalants are chemical substances whose most frequent means of administration are inhalation and/or aspiration. They are classified into four groups in accordance with their chemical composition: volatile solvents, gases, nitrates⁷ and aerosols.⁸ Volatile solvents are liquids that are vaporized the moment they are exposed to the air, such as gasoline, glues, liquid corrector fluid, markers, and erasers, among others. Gases include butane, propane, ether, chloroform, nitrous oxide, helium, etc. Aerosols comprise solid, liquid, or gas products that are discharged by a propellant force of a gas through a valve,⁹ such as air fresheners, hairsprays, spray paint, etc.

Recently there has been a group of nitrates known colloquially as poppers, described as follows.

Description of poppers

Poppers are substances formed by esters of nitrous acid and the combination of alcohol, sodium nitrate, and sulfuric acid. The most common types are amyl nitrate, isobutyl nitrate, and butyl nitrate.^{10,11}

The name "poppers" is onomatopoeic; derived from the noise produced when popping the blister cap on the container of amyl nitrate.¹²

The first records of its use as a substance of abuse in the USA are by Newell et al. in 1983, while in Mexico, the SRID records its first mention in June 1988.

Physical description

Poppers are a volatile, almost transparent yellow colored liquid, which evaporates upon contact with the atmosphere.

Because they have such a strong smell, manufacturers add fruity scents to make them more attractive to users.¹³

They are packaged in small bottles of amber colored glass, generally 3cm high with contents from 10ml to 30ml of liquid. (Figure 1).

Their use is determined by high substance volatility, because of which, users usually open the bottle and immediately hold it below the nose, inhaling until the contents are gone, as it evaporates immediately.

Effects

When in contact with the Autonomic Nervous System, nitrates or organic nitrates such as glyceryl trinitrate, isosorbide dinitrate, isosorbide mononitrate, pentaerythritol tetranitrate, and amyl nitrate¹⁴ produce a vasodilatory effect on the smooth muscles that surround blood vessels and facilitate the circulation of blood.

This property has led to its use in treating cardiovascular diseases, caring for angina, acute coronary syndrome, and chronic heart failure.¹⁵ However, in the case of amyl nitrate or poppers, given its volatile properties, the various negative effects, and the tolerance it produces in patients, prescription of it was stopped.

The consequences of poppers consumption includes an increase in intracranial pressure, tachycardia, dizziness, debility, pallor, headaches, nausea, vomiting, irritation around the lips, cheeks, and nose, and dermatitis.^{10,11,16,17} Among the most serious effects is the development of lipid pneumonia.¹⁸

Long-term use produces effects on the immune and hematological system, which can occasionally cause hemolytic anemia^{11,19-22} and sometimes death.²³

Recreational use

Poppers are used to increase pleasant sensory stimulation.^{11-13,24} According to informal ethnographic reports, the dura-



Figure 1. Photograph of a bottle of poppers.

tion of the effect is between 15 seconds and two minutes maximum, while the bibliography reports between 10 seconds and five minutes.²⁵ It is noted that it is therefore feasible for chronic users to consume poppers 20 or more times in a few hours.^{11,26}

By having a muscle relaxing effect, they also facilitate penetration,^{11,27} therefore their consumption has been reported more frequently in men who have sex with other men.^{27,28-33} The risk factor for this practice is in not using protection, which means it is associated with contracting sexually transmitted infections²⁹ (HIV,³⁴ syphilis, hepatitis B or C, among others).

Another risk factor is that users combine it with other substances such as cocaine, "ecstasy", crystal meth, mushrooms, and Viagra,^{12,32,35} which have antagonistic effects, increasing the probability of infarctions or death.

Motives that facilitate the consumption of poppers are wide availability, low cost, and legal use; for example, as air fresheners or liquid incense.

They are sold in sex shops, bars, and on various websites.^{12,27} In Mexico City, their prices range between 200 and 300 pesos (13 pesos = 1 US Dollar).

Epidemiology of poppers in Mexico

According to Juvenile Integration Center data, at the national level, of 101,414 patients admitted for the first time for treatment during the period 2005-2009, some 573 consumers of poppers were registered, which is equivalent to 0.6% of the population registered during that period.³⁶⁻⁴⁴

In the Federal District and Metropolitan Area, according to results from the Drug Information Reporting System (SRID), from the first mention of their use in 1988⁴⁵ through 1999, a low incidence was recorded: 0.2% of the total population recorded during that period. From 2000 through 2012-I, the incidence increased to 0.7% of the population recorded during that period.⁶

Given that the Drugs Information Reporting System (SRID) has functioned for 27 years as an epidemiological surveillance system that identifies changes in consumption patterns in a timely manner, as well as recording trends in various substances, it could be considered the most consistent tool for following the trajectory of this phenomenon.

Because of the above, the aim of this work is to present epidemiological information that shows poppers as an emerging drug within the setting of substance consumption in Mexico City. A description will be given of: the sociodemographic characteristics, the type of consumption, and the associated problems by means of data gathered by the Drugs Information Reporting System during the period 2000-2012-I. The consumption trends in the epidemiological category "at some time in their life" will also be presented, recorded over 24 years from 1988-2012-I.

METHOD

Instrument

To assess the consumption of poppers, an analysis was made of data obtained through the Individual Report on Consumption of Drugs during the period June 2000 through June 2012-I. This interview was applied on June 30 and November 30 of each year in health and justice enforcement institutions in Mexico City.^{6,46} The instrument includes indicators selected from the data proposed by the World Health Organization, previous Mexican research, and by participating institutions: sociodemographic data, problems associated with consumption, and primary cause for first consumption of drugs.

Sample

The sample was comprised of 108 poppers consumers, equivalent to 1.9% of inhalant users who attended the participating institutions for the first time during the period 2000-2012-I and who recognized having taken drugs (excluding alcohol and tobacco) at least once in their life, with the aim of becoming intoxicated.

In the case of consumption trend, this was obtained from 116 users of poppers once in their life, equivalent to 0.9% of inhalant consumers captured by the SRID during the period 1988-2012-I. To carry out both the description of the sample as well as the trend graphic, statistical analyses were carried out using the SPSS program version 19.

RESULTS

The sample was comprised of 108 poppers users who attended the participating institutions of SRID during the period June 2000 through June 2012-I; of these, 70.4% were male and 29.6% female. The age group that reported highest use was from 15 to 19 years. In terms of consumption, analysis by gender indicated that males use them in greater proportion in groups of 15-19 years of age and 20-24 years of age, and they had a fixed working activity, while females use this substance at an earlier age, between 15 and 19, and do not carry out any activity (Table 1).

The starting age with the highest percentage was present in the group of 15-19 years; however, it is notable that 17.6% of people did it before age 14 (Table 2), which is not widely reported in the international bibliography.

In terms of the most frequent combinations that accompany poppers consumption, marijuana, alcohol, tobacco, cocaine, and sedatives were all reported. The mean number of drugs consumed by these people was 4.2, excluding socially accepted substances (Table 3).

In terms of user type, 58.3% indicated habitual consumption of poppers which ranged from mild to high (Table 4) with no difference being detected by gender.

Table 1. Sociodemographic characteristics of poppers users N=108

	Total		Males %		Females %	
	f	%	n=76	n=32		
Age						
• 12 a 14	5	4.6	1.3	12.5		
• 15 a 19	40	37.0	30.4	53.1		
• 20 a 24	27	25.0	30.3	12.4		
• 25 a 29	11	10.2	10.5	9.3		
• 30 or more	25	23.1	27.5	12.4		
Civil status						
• Single	83	76.9	75.4	81.2		
• Married	5	4.6	5.3	3.1		
• Civil partnership	10	9.3	10.5	6.2		
• Divorced	4	3.7	3.9	3.1		
• Separated	6	5.6	5.3	6.2		
Education						
• Primary	6	5.6	6.7	3.1		
• Secondary	46	43.0	37.4	56.3		
• Technical	8	7.4	6.6	9.4		
• Preparatory	35	32.7	33.3	31.2		
• Higher education	12	11.2	16.0	-		
Occupation						
• No occupation	29	27.8	19.8	43.8		
• Student	23	21.7	18.9	28.1		
• Underemployed	17	16.0	20.3	6.2		
• Employed or business person	36	34.0	39.7	21.9		
• Professional	1	0.9	1.4	-		

Source: Ortiz A., Martínez M., Meza D. Drugs Information Reporting System (SRID). Period 2000-2012 I.

Consumption trends show that from 1988 through 2000, the proportions of consumption did not exceed 0.5% and there were even cases where consumption was not reported for two years between each period. However, from 2001, an increase was observed in the percentages of use, as well as the continuity of records (Figure 2).

In terms of problems reported by poppers users leading up to their consumption of substances, family issues are

Table 2. Starting age for poppers consumption

	Total		Males		Females	
	% ¹	% ²	% ³	% ²	% ³	
12 to 14 years	17.6	47.4	11.8	52.6	31.2	
15 to 19 years	51.9	67.9	50.0	32.1	56.2	
20 to 24 years	19.4	95.2	26.3	4.8	3.1	
25 to 29 years	6.5	85.7	7.9	14.3	3.1	
30 or more	4.6	60.0	3.9	40.0	6.2	

%¹ Percentage calculated in terms of total sub-sample (N).

%² Percentage calculated in terms of number of cases (f).

%³ Percentage calculated in terms of number of cases (n) of each gender.

Table 3. Substances consumed by poppers users

	Total	Males		Females	
	% ¹	% ²	% ³	% ²	% ³
• Amphetamines	20.4	81.8	23.7	18.2	12.5
Sedatives	50.9	72.7	52.6	27.3	46.9
Opiates	9.3	80.0	10.5	20.0	6.2
• Hallucinogens	37.0	72.5	38.2	27.5	34.4
Cocaine	73.1	75.9	78.9	24.1	59.4
Heroin	5.6	83.3	6.6	16.7	3.1
• Marijuana	93.5	68.3	90.8	31.7	100.0
Alcohol	89.9	68.0	86.8	32.0	96.9
Tobacco	83.3	68.9	81.6	31.1	87.5
ONMD*	20.4	59.1	17.1	40.9	28.1
Number of drugs consumed**	Min. 1	Max. 8	Mean 4.2	Typ. Dev. 1.6	

* Other non-medical drugs. Synthetic or designer substances.

** Alcohol and tobacco were excluded from analysis.

%¹ Percentage calculated in terms of total sub-sample (N).

%² Percentage calculated in terms of number of cases (f).

%³ Percentage calculated in terms of number of cases (n) of each gender.

the most frequently reported by both males and females. In terms of problems perceived by users to be derived from drug use, the greater proportion are family issues (family conflict, breakups), those classified as "nervous-mental" issues (anxiety, sleep disruption, depression), and psychological issues (loneliness, impulsivity), with similar percentages in both genders.

In females, proportions of academic (truancy) and organic problems (anemia, pathology of the airways) are higher than in females, while in males, legal problems stand out more (detention for carrying a substance) (Table 5).

The perception of poppers is that they are "safe" because they do not have an immediately evident association with problems of physical violence, illnesses requiring hospitalization, accidents, crimes, etc., such that the user wants to believe that their use has no consequences: "they're not dangerous".

Table 4. Type of poppers user

	Total	Males		Females	
	% ¹	% ²	% ³	% ²	% ³
Experimental	20.4	72.7	21.1	27.3	18.8
Occasional	21.3	69.6	21.1	30.4	21.9
Light	38.9	71.4	39.5	28.6	37.5
Moderate	8.3	77.8	9.2	22.2	6.2
High	11.1	58.3	9.2	41.7	15.6

Experimental. Used once in life.

Occasional. Consumption in the past year, but not in the past month.

Light. Consumption on 1-5 days in the past month.

Moderate. Consumption on 6-19 days in the past month.

High. Consumption on 20 or more days in the past month.

%¹ Percentage calculated in terms of total sub-sample (N).

%² Percentage calculated in terms of frequency of use.

%³ Percentage calculated in terms of number of cases (n) of each gender.

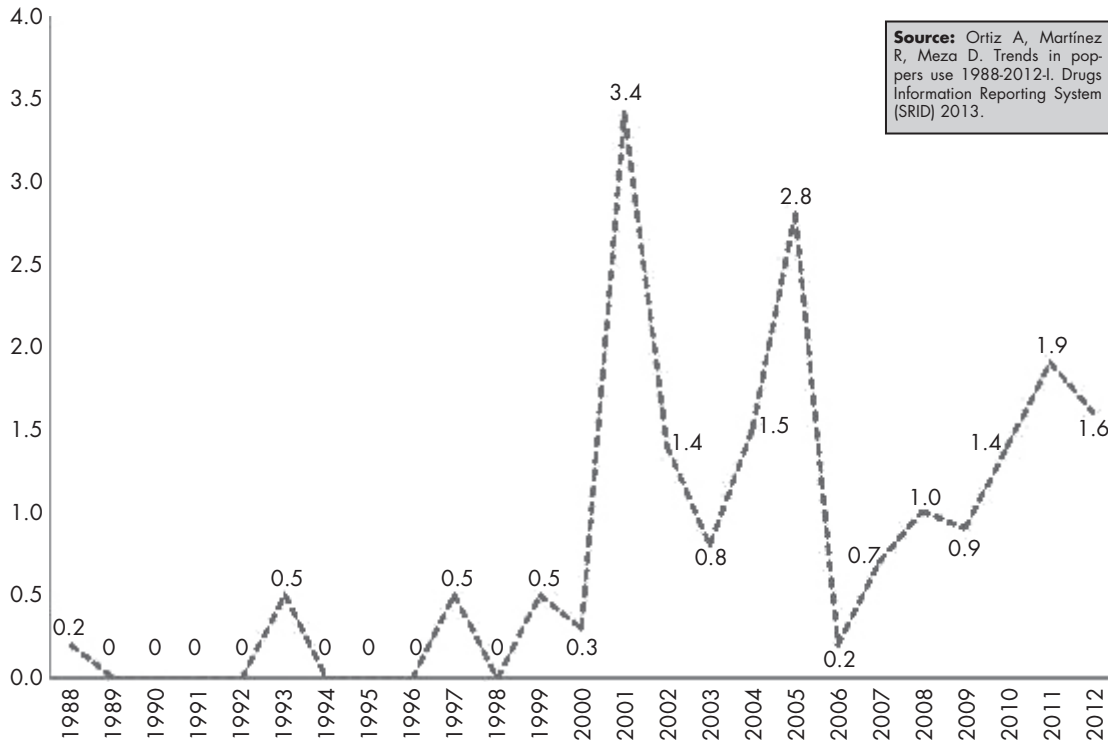


Figure 2. Trends in poppers use at some time in life (1988-2012-I), (N =1116).

Furthermore, the user assumes that their effects are brief and confined to a private physical environment: their consumption is individual, not collective, and their effects will be over in a few minutes. This situation is the argument to contrast their use with alcohol and tobacco, to which poppers do indeed add danger.

Part of this perception permeates into epidemiological classification systems, and the result is that poppers are classified within a wide group of inhalant substances.

DISCUSSION

Poppers are an inhalant substance of relatively low prevalence. They are not reported in national epidemiological surveys on homes and students. In the same way, in international bibliography it is found that epidemiological systems sub-classify nitrates within the group of inhalants²⁷ and the result is that precision is lost in their assessment.

Additionally, international bibliography^{29,31-33,35,47,48} shows that research into their consumption is more centered on the group of men who have sex with other men, than on questions of use by adolescents.^{25,49,50}

It can be appreciated that the use of nitrates is more extensive than has been reported through traditional epidemiological methods; young people start consumption at early ages and maintain a pattern of frequent use.

Poppers are substances about which the user is very

misinformed; they do not recognize the danger of consumption because its use is apparently not associated with fights, accidents, absence from work, etc., as is the case with other substances like alcohol.

However, poppers consumption generates states of tolerance, and the user needs to increase the dose or reduce the time between consumptions in order to produce or experience the same effects.

Table 5. Proportion of prior and deriving problems

Types of problems	Prior		Deriving	
	M %	F %	M %	F %
Academic	1.4	6.5	14.3	35.7
Economic	2.9	9.7	9.1	16.7
Familiar	13.2	20.0	44.2	52.9
Work	1.4	3.3	14.1	7.7
Legal	1.4	—	15.6	3.6
Nervous-mental	10.1	9.7	31.9	38.7
Organic	—	3.2	23.2	48.4
Psychological	7.2	6.9	35.1	36.4
Sexual	2.9	9.7	8.8	6.7
Social	7.4	3.3	20.3	25.0
	Minimum	Maximum	Mean	Typ. Dev.
No. probs. prior	1.0	7.0	2.51	1.60
No. probs. deriving	1.0	10.0	3.48	2.16

% Percentage calculated in terms of number of cases (n) of each gender.

It is easy to purchase and use this substance – they do not require any complicated paraphernalia for use. Furthermore, they are legal and relatively cheap products.

That the consumption of poppers is greater among adolescent males and females, consumption patterns tending to be high, and the option of combining them with other substances, as well as ignorance around what they are and the risks of consumption, all reflect the need to develop future research.

Lines of inquiry required, among others, are the following:

1. What psychological and social mechanisms influence in minimizing the perception of these substances' effects?
2. Identify mechanisms that allow epidemiological assessments closer to the consumption of these substances.
3. Ethnographic investigation into risk groups, oriented towards identifying motives and characteristics associated with poppers consumption.

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