Drops of madness? Recreational misuse of tropicamide collyrium; early warning alerts from Russia and Italy

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Abstract

Background: Tropicamide is an antimuscarinic drug usually prescribed as an ophthalmic solution to induce short-term mydriasis and cycloplegia. Over the last 2 years, tropicamide has been reported in both Russia and Italy to be self-administered intravenously (IV) for recreational purposes.

Methods: The literature on tropicamide was searched in PsycInfo and Pubmed databases. Considering the absence of peer-reviewed data, results were integrated with a multilingual qualitative assessment of a range of Web sites, drug fora and other online resources (i.e., e-newsgroups, chat rooms, mailing lists, e-newsletters and bulletin boards): between January 2012 and January 2013, exploratory qualitative searches of more than 100 Web sites have been carried out in English and Italian using generic and specific keywords such as “legal highs,” “research chemicals,” “online pharmacy,” “tropicamide,” “mydriacil,” “tropicacyl,” “visumidriatic,” “online pharmacies” and “tropicamide recreational abuse” in the Google search engine.

Results: Misuse of tropicamide typically occurs through IV injection; its effects last from 30 min to 6 h, and it is often taken in combination with other psychoactive compounds, most typically alcohol, marijuana and opiates. Medical effects of tropicamide misuse include slurred speech, persistent mydriasis, unconsciousness/unresponsiveness, hallucinations, kidney pain, dysphoria, “open eye dreams,” hyperthermia, tremors, suicidal feelings, convulsions, psychomotor agitation, tachycardia and headache.

Discussion/conclusions: More large-scale studies need to be carried out to confirm and better describe the extent of tropicamide misuse in the European Union and elsewhere. Health and other professionals should be rapidly informed about this new and alerting trend of misuse.

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1. Introduction

Large numbers of novel herbal, chemical and pharmaceutical psychoactive drugs have become available online to users. Online pharmacies are becoming increasingly important in making prescription drugs more widely accessible, often illegally without a prescription [12].

The urgent need to carry out an investigation related to tropicamide arose during Web-monitoring activities carried out by the Europe-wide ReDNet project (www.rednetproject.eu) [2].

Tropicamide is an antimuscarinic drug generally used as ophthalmic solution to induce short-acting mydriasis and cycloplegia. Maximum mydriatic effect appears in 20–40 min, while maximum cycloplegia occurs within 20–35 min. Both cycloplegia and mydriatic effects last approximately 6–7 h; however, complete recovery from mydriasis may require up to 24 h in some individuals. Due to its relatively short duration of effects, it is routinely used during eye examinations [3].

When applied as eye drops, side effects include increased intraocular pressure, transient stinging, blurred vision and photophobia; systemic side effects such as allergic reactions, tachycardia and headache are very rare [3].

Tropicamide has been recently anecdotally reported to be recreationally misused from online sources [4,5]. Similar to other anti-cholinergics, tropicamide is commonly referred to as a “deliriant” [6,7]. However, there is no mention of tropicamide misuse in the medical/scientific literature.
The largest abuse of tropicamide occurs in Eastern European Countries, especially in Russia [4,5], although new alerts have recently emerged from North-Eastern Italy, in the Trento area [8]. Considering the above, we aimed here at analyzing the existing medical literature as well as online material on the misuse of this drug.

2. Materials and methods

The ReDNet Project (www.rednetproject.eu) is a European-Commission-funded research project [1,2]. The literature on tropicamide was searched in PsychInfo and Pubmed databases. Considering the absence of peer-reviewed data, results were integrated with a multilingual qualitative assessment of a range of Web sites, drug fora and other online resources (i.e., e-newsgroups, chat rooms, mailing lists, e-newsletters and bulletin boards): between January 2012 and January 2013, exploratory qualitative searches of more than 100 Web sites have been carried out in English and Italian using generic and specific keywords such as “legal highs,” “research chemicals,” “online pharmacy,” “tropicamide,” “mydriacyl,” “tropicacyl,” “visumidriatic,” “online pharmacies” and “tropicamide recreational abuse” in the Google search engine. These Web sites were monitored on a regular basis, daily, weekly or monthly depending on relevance. Links from forums, Web sites and other related material, including newspapers and magazines, were followed as well. Permission for the study was granted by the School of Pharmacy Ethics Committee, Hatfield, UK (15 December, 2010; PHAEC/10-42).

3. Results

No publications on the recreational misuse of tropicamide were found on PubMed and PsychInfo. Only a limited number of very recent (2011–2012) tropicamide personal experiences were identified from the Web [4,9] as well as several articles in online newspapers [5,10,11].

A Google Trend search on tropicamide [12] showed an increased volume of Web searches in 2011 in comparison with the previous 5 years (mainly in English-speaking countries including the United States and the United Kingdom).

3.1. Way of consumption

Misuse of tropicamide typically occurs through intravenous (IV) injection [4,5,8,9].

3.2. Effects

Like other anticholinergics, tropicamide is used for recreational purposes to achieve mindsets such as unconsciousness and mental confusion [4,7–9]. Some online misusers report that tropicamide is associated with “fun,” being an “enjoyable” experience; conversely, others described the effects associated with the drug intake as “horrific,” “scary” and “dangerous” [4,9]. Specifically, reported effects of tropicamide IV consumption included slurred speech, unconsciousness/unresponsiveness, weight loss, hallucinations, kidney pain, dysphoria, “open eye” dreams, hyperthermia, tremors, suicidal feelings, convulsions, psychomotor agitation, tachycardia and headache [4,5,8,9].

3.3. Duration

The effects of IV tropicamide injection reportedly last from 30 min to 6 h; the drug is also known as “seven monther” in relation with “the amount of time (e.g., 7 months) it takes to kill” [4,5,8,9].

3.4. Combinations

Tropicamide is often taken in combination with other compounds such as alcohol, marijuana and opiates [4,5,8,9].

3.5. Distribution

Tropicamide misuse is very popular in Russia; the death of one 25-year-old Russian male was anecdotally associated with tropicamide misuse [5].

The possibility of a current tropicamide abuse in Italy, especially from the northern area of Trento, has recently been highlighted [8]; however, no reports were found on Italian Web sites.

3.6. Cost

Tropicamide is apparently made available for purchase from both online [13] and regular pharmacies [10,11]. The price of the drug on the market ranges from about $7 to about $15 [13].

4. Discussion and conclusions

To the best of our knowledge, this work constitutes the first report on tropicamide misuse. Tropicamide might be perceived by misusers as being a recreational drug, in addition to a pharmaceutical product, and this may be a reason for concern. In fact, the apparent possibility to purchase tropicamide from both Web sites and through regular pharmacies makes this drug very easily available to vulnerable individuals, including children and adolescents.

Recreational misuse seems to be limited to marginalized individuals with a history of recreational polydrug misuse [4,5,9].

The mechanism of action of tropicamide is not completely clear: it binds to and blocks the M4 muscarinic receptor, but its action on the other muscarinic receptors is still not known [14]. Over the past decade, the abuse of anticholinergic drugs, especially among psychiatric patients, has received some attention in the clinical setting and medical literature [6,15,16]. However, other cases of abuse of anticholinergic collyriums are still extremely rare: the only existing report is about two cases of probable abuse of cyclopentolate hydrochloride drops [17].

Similarly to other substances like arsenic, tropicamide can be accumulated in tissues and body fluids [18,19]; renal or hepatic failures due to tropicamide intoxication are frequent causes of death [19].

From here, we were unable to elicit any information relating to the dosages of IV tropicamide. Munhoz et al. recently reported that 1 mg of tropicamide eye drops may induce delirium and psychoactive side effects [20]; it can thus be hypothesized that even very low dosages of IV tropicamide may be associated with serious levels of intoxications. A toxicological analysis performed on five individuals who died after tropicamide abuse showed a tropicamide blood concentration ranging between 0.64 and 2.03 μg/ml [21].

From a clinical point of view, physicians should be aware of tropicamide misuse issues so that signs and symptoms of tropicamide misuse/intoxication may be rapidly recognized. Moreover, the general risks of IV injections (such as infections, phlebitis and abscesses) should be taken into consideration.

One could wonder about the limitations of carrying out a risk of misuse assessment of a drug while taking into account the online comments only; in fact, it may be inappropriate to trust information obtained from the Internet without independent verification. However, in the absence of relevant peer-reviewed data, this seems to be the only method to obtain preliminary information about new and emergent phenomena.

It is suggested that more large-scale studies need to be carried out to confirm and better describe the extent of tropicamide misuse in the...
European Union and elsewhere; moreover, health and other professionals should be rapidly informed about this new and alerting trend of misuse.

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