LETTER TO THE EDITOR

Unintentional nutmeg autointoxication

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ABSTRACT

Nutmeg ingestion in large amounts can cause toxic symptoms such as hallucinations, tachycardia and anticholinergic effects. We describe a case of a 37-year-old woman who experienced an unintentional autointoxication of nutmeg. It is likely that nutmeg intoxication is underreported. We suggest to specifically think of nutmeg ingestion in case of symptoms as mentioned above.

KEYWORDS

Intoxication, toxicity, nutmeg

What was known on this topic?
In large quantities, nutmeg has toxic effects including hallucinations, tachycardia, nausea, vomiting, agitation, and hallucinations. Because of these effects it is occasionally used as a recreational drug.

What does this add?
This case report shows how accidental autointoxication with nutmeg can occur. These cases are very rarely reported in the literature. However, we believe that because both patients and physicians are unaware of the possible toxic effects of nutmeg, many cases will not be recognised. In case of an unknown intoxication, consider to specifically ask about ingestion of nutmeg

INTRODUCTION

Nutmeg is a commonly used spice derived from the seed of the *Myristica fragrans* tree. The spice is normally used in small amounts to flavour food. When large amounts are taken, several toxic effects, including tachycardia, nausea, vomiting, agitation, and hallucinations, have been described.[1-4] Because of the hallucinatory effects, nutmeg is occasionally used as a recreational drug. Therefore, most intoxications are described in the context of intentional exposure.[1-5] Unintentional autointoxication in adults is rare because the toxic effects only occur when large quantities are eaten. However, it is expected that the actual number of accidental nutmeg intoxications is underreported because many patients and physicians are unaware of the toxic effects of nutmeg. We present a case of an unintentional autointoxication which would have been unrecorded if the patient had not made the diagnosis herself.

A 37-year-old woman presented at the emergency department with confusion, incoherent speech and drowsiness. She had attended the yearly conference of the Dutch Society of Internists and had no symptoms until she woke up at 4 am and felt dizzy and confused, had a very dry mouth and a sense of incomplete voiding. Initially she blamed her condition on the fact that she had joined the annual party, although she had only consumed three units of alcohol throughout the whole evening. In the morning she could not find the dining hall of the hotel and did not recognise her colleagues. Because of this unusual behaviour, her colleagues took her to the emergency department of a nearby hospital. She did not have a relevant medical history, used no medication, did not smoke, used alcohol sparingly and did not use illicit drugs. At the emergency department she had a blood pressure of 120/65 mmHg and a sinus tachycardia of 120 beats/min. Further physical and neurological examination did not reveal any abnormalities. Standard blood and urine tests were normal. Screening of the urine for drugs of abuse was not performed. She was discharged without a diagnosis. Although she was more coherent by the time she left the hospital, she still felt 'groggy'. One hour later, when her colleagues drove her home, she suddenly realised what her diagnosis was.

During the dinner prior to the party she had added about two teaspoons of nutmeg to her asparagus, which was more than she intended. She had heard previously about a case of nutmeg intoxication and with some help from Google, she realised that the effects she had experienced were highly suggestive for a nutmeg overdose. The effect of mental confusion subsided within ten hours; however, the symptoms of a dry mouth and urine retention persisted for 36 hours. She recovered completely but has not eaten nutmeg since.

DISCUSSION

Nutmeg was used for its hallucinogenic and euphoric effects as early as during the Crusades. The first case of nutmeg intoxication described in literature was by Lobelius in 1576.[6] In the hippy culture of the 1960s and 1970s, nutmeg was temporarily fashionable as a cheap alternative as an hallucinogenic. However, because of the frequently encountered severe headache afterwards, described as the 'nutmeg hangover' it has never become a very popular drug and it has never been encountered as a problem for addiction on a large scale.

Four case series and several case reports of nutmeg intoxication have been published.[1-10] The majority of these reports describe intentional nutmeg ingestions, mostly adolescents with accidental overdoses leading to severe intoxication.[1,3-5,7] Accidental autointoxication accounts for <20% of the published case series and an occasional case report.[1-4,10] On the internet, however, several reports can be found of accidental nutmeg autointoxication.[11,12] The current case is highly suggestive for a nutmeg intoxication, although intoxication by other substances is still a possibility, despite the fact that the patient does not mention it.

The main symptoms of nutmeg overdose are cardiovascular, central nervous system, anticholinergic and local effects in the stomach. Cardiovascular symptoms consist of hypertension, tachycardia and can also include, in severe cases, hypotension and shock. Central nervous system symptoms described are agitations, lethargy/drowsiness, feelings of impending doom, anxiety, hallucinations, blurred vision, symmetric pupil dilation and hypothermia.[13] Anticholinergic effects such as urinary retention, dry mouth, tremor and seizures following nutmeg intoxication have been reported. Finally, local effects in the stomach can result in nausea, vomiting and abdominal pain. Toxic symptoms have been observed with a nutmeg dose of as little as 5 g, which is equivalent to two teaspoons or two-thirds of a tablespoon of grated nutmeg.[7] The toxic effects are attributed to the volatile oil myristicin, which is the active substance of nutmeg and in a lesser extent in spices such as parsley, dill and celery.

The exact mechanism of how myristicin can be attributed to the symptoms related to nutmeg overdose is not yet clear. It is known is that myristicin can be metabolised to 3-methoxy-4,5 methylenedioxyamphetamine also known MMDA. A more well-known analogue of MMDA is 3,4-methylenedioxy-N-methylamphetamine (MDMA), also known as ecstasy, which may explain the euphoric effect of nutmeg.[14] The triglyceride trimyristin, the oil of the nutmeg, has been associated with anxiogenic effects via serotonin and GABA receptors.[15]

Myristicin has been shown to be a (weak) monoamine oxidase (MAO) inhibitor in a rat model, which could also provide an explanation for nutmeg's sympathomimetic effects.[16] Other components of myristicin (linalool, safrol, isoeugenol, and eugenol) which are structurally similar to serotonin agonists may explain the cardiovascular response such as tachycardia.[17]

Symptoms usually occur three to eight hours after ingestion and can last for up to 48 hours. The clinical course is usually benign and self-limiting, although two deadly cases attributed to nutmeg overdose have been published.[2,8] Management is mainly supportive. In severe cases, administration of intravenous fluids and oral anti-emetics may be necessary.[1,4,10] Benzodiazepines are the mainstay of treatment in patients who present with agitation and anxiety.[1] A dose of activated charcoal may be helpful in alert patients with an intact airway.

CONCLUSION

This case demonstrates that unintentional nutmeg autointoxication can happen, and probably occurs more often than is recognised. Patients presenting with suspected intoxication of unknown origin is a regular occurrence at the emergency department. After ruling out easily traceable causes such as alcohol, benzodiazepines and cocaine, many cases remain unsolved. This would have been another of those cases if the patient herself had not made the diagnosis. We suggest that in case of unexplained symptoms of tachycardia, vomiting, agitation and hallucination, to think of nutmeg ingestion.

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