2003
VOLUME 5
ISSUE 4

Utox Update

UPCC A PUBLICATION OF THE UTAH POISON CONTROL CENTER FOR HEALTH PROFESSIONALS

Nutmeg

Introduction:

Myristica fragrans is a tropical aromatic evergreen tree that yields an apricot-shaped fruit. Contained in the fruit is a nutmeg seed covered by a protective layer or aril. The seed is processed to make nutmeg and the aril can be processed into a spice called mace.[1] Nutmeg is a common household spice and is frequently used in cooking and baking. Recently, nutmeg has become popular among individuals seeking legal and natural hallucinogenic and euphoric experiences. The internet has contributed to the increased popularity of nutmeg and other natural psychoactive compounds.[2,4] Available forms of nutmeg include the whole nut, a ground powder, and volatile oils.[3]

Pharmacology/Pharmacokinetics

The volatile oils found in nutmeg and mace are primarily responsible for their pharmacologic effects. Myristicin and elemicin are two of many pharmacologically-active chemical compounds found in nutmeg and have similar chemical structures to amphetamines and mescaline, respectively. Although many theories exist about the mechanism of action of myristicin and elemicin, the exact mechanism is unknown.[1,3,4]

Culinary use of nutmeg is unlikely to produce toxicity. For example, 1 to 2 teaspoons of nutmeg in a pumpkin pie will not induce psychogenic experiences. However, when quantities of 5-20 grams (1-3 tablespoons) of nutmeg powder or 1-3 nutmeg seeds are ingested on an empty stomach, central nervous system and gastrointestinal effects can be seen. Symptoms occur approximately 2 to 6 hours after ingestion but effects can last for several days.[1,3,5] The recommended uses of nutmeg in alternative medicine are for the treatment of some gastrointestinal disorders and rheumatism.[1,4,5]

Adverse Effects and Clinical Toxicology

Adverse effects of nutmeg abuse can be categorized into five groups based on the body system affected and are listed below in Table 1. Effects of nutmeg are dose-dependent and very serious adverse events reported include abortion, coma, and death.[5]

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Table 1: Adverse effects associated with nutmeg abuse.[1,3,5]

System	Effect
Central Nervous System	Anxiety, confusion dizziness, drowsiness, euphoria, giddiness, headache, hyperactivity, hallucinations (auditory, tactile, visual), incoherent speech, seizures, stupor
Cardiovascular	Flushing, hypotension, tachycardia
Gastrointestinal	Burning epigastric pain, excessive thirst, ileus, nausea, vomiting, xerostomia
Genitourinary/Reproductive	Urgency, abortifacient
Other (ocular, peripheral)	Double vision, miosis, chest
	pressure, hypothermia, numbness, sweating

The psychoactive and toxic effects of nutmeg are attributed to its ability to affect the central nervous system. Because nutmeg and mace products contain varying amounts of volatile oils, exact doses of these products necessary for psychogenic effects without experiencing adverse events are unknown. Blood or urine toxicology testing is not routinely available for diagnostic purposes.

Pregnancy/Lactation Issues

Normal amounts of nutmeg during pregnancy and lactation have shown no adverse effects. Toxic doses of nutmeg are known to induce abortion in pregnant women. Therefore, nutmeg in high doses is contraindicated during pregnancy. Insufficient data is available regarding nutmeg during lactation.[1,3]

Treatment

Prevention of absorption is the first step in the treatment of nutmeg toxicity. In general, if a substantial dose of nutmeg has been ingested it will induce emesis. Because of its CNS effects and possible seizure risk, ipecac-induced emesis is contraindicated. Therefore, activated charcoal is the treatment of choice in the prevention of nutmeg absorption.[1]

Large doses of nutmeg (5-30 grams) can cause nausea and GI upset in patients. The use of anti-emetics may be warranted. Agitation is frequently observed in patients that have ingested large doses and the use of diazepam, or another benzodiazepine, is useful in calming patients and decreasing agitation.

Summary

Nutmeg and mace are readily available spice products that can be used in culinary recipes or they can be abused by individuals seeking psychogenic experiences. Additionally, alternative medicine claims for the use of nutmeg for various ailments are anecdotal and are not scientifically tested and proven.

The toxicology of nutmeg is unpredictable and the chemical constituents responsible for toxicity are not well defined. Unreliable dosing history, chemical variability, and multiple adverse effects complicate the toxicity of nutmeg. Its toxic compounds are not detected on routine blood or urine drug screens. In addition, there is not a specific antidote so treatment is supportive.

Dwayne Kisby, PharmD Student

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Update on Ipecac Syrup

The American Academy of Pediatrics (AAP) recently issued new guidelines that ipecac syrup should no longer be used routinely as a poison treatment intervention in the home. The AAP recommendations are based on a lack of clear evidence of ipecac's benefit and the risk of people abusing the product.

The UPCC has recommended the use of ipecac syrup for certain childhood poisonings since 1971. Since 1985 the use of ipecac syrup in poisoned patients has steadily declined to less than 1% of exposures reported to US poison centers. In Utah, ipecac syrup was recommended in 0.4% of exposures reported in 2003. Discontinuing its use will change practice in Utah for a small number of possible poisonings. The FDA is currently evaluating the status of ipecac syrup. A decision on the status of ipecac is expected sometime in 2004.

The UPCC and Utah Chapter of the American Academy of Pediatrics/Intermountain Pediatric Society have issued these suggestions:

- In case of an actual or possible poisoning contact the Utah Poison Control Center at 1-800-222-1222, or contact your physician.
- Ipecac syrup that has not expired need not be thrown out. However, do not use ipecac before consulting with the UPCC or your physician.
- Do not use any first aid or home remedy for poisoning before consulting the UPCC or your physician.
- Do not buy activated charcoal. The UPCC does not recommend home use of this product.

Activated charcoal products are available in stores and can be purchased by consumers. Despite the availability of these products, neither the UPCC nor the American Academy of Pediatrics recommends its home use. Several studies have documented the difficulty in administering activated charcoal in the home and no study has demonstrated a clear benefit for the home use of activated charcoal. Likewise, natural products or other alternative home treatments are also not recommended.

While the impact of the AAP recommendations and possible FDA action are not known at this time, they are unlikely to result in a significant increase in hospital referrals for pediatric poisonings.

UPCC Update

The UPCC moved on October 22, 2003 to 585 Komas Drive. This new location is also in Research Park and is home to the University of Utah Data Center. The benefits of our new location include: backup generator power, safety for staff and security. Our new location is also larger.

Along with the move, the UPCC got a new phone system. This phone system is an Automatic Call Distributor (ACD). If you have called us recently, you have noticed a big change. Our goal is to assist you as quickly as we can. We want your feedback! Please let us know what you think of our new system and if you have suggestions for improvement. We are continually evaluating the phone system announcements and have already made a number of changes to streamline the options. You may provide feedback by email: poison@hsc.utah.edu or by phone (801) 587-0600.

The number to reach a specialist in poison information remains (800) 222-1222 and our facsimile number remains (801) 581-4199. Administrative Office number for business information only is now (801) 587-0600. Educational Materials/presentations number is now (801) 587-0603.

The Utah Poison Control Center expresses its sincere thanks to

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for their generous contribution that allows us to produce and distribute this newsletter.

North American Congress of Clinical Toxicology Annual Meeting

The North American Congress of Clinical Toxicology was held in Chicago on September 4th-9th, 2003. Congratulations to the following staff members for their hard work on presentations for this national meeting: John Stromness, Kathy Anderson, Brad Dahl, Brian Beck, Heather Bennett, Barbara Crouch and Martin Caravati. The following research was presented by Martin Caravati and Barbara Crouch from the UPCC and Joetta Juenke of ARUP.

In-Vitro Effects of Quetiapine on Tricyclic Antidepressant Immunoassays

Background: Quetiapine is a dibenzothiazepine antipsychotic agent with structural similarity to the tricyclic antidepressants (TCA). The potential for quetiapine to cross react with tricyclic antidepressant immunoassays was investigated in vitro.

Methods: Quetiapine was added to nine samples of pooled drug free plasma at concentrations from 1 to 640 ng/mL. The samples were tested using the Abbott Tricyclic Antidepressant TDx assay on the TDxFLx (Abbott) in two separate laboratories, the Syva® Emit® tox™ Serum Tricyclic Antidepressant Assay on the AU400 (Olympus), and the S TAD Serum Tricyclic Antidepressant Screen on the ACA®-Star 300 (Dupont) autoanalyzers. The TDxFLx assay is quantitative, while the Emit® and S TAD assays are qualitative screening assays with a threshold of 300 ng/mL for TCA positivity.

Results: The quantitative assay showed a concentration-related TCA cross-reactivity beginning at quetiapine concentrations ≥ 5 ng/mL. The 640 ng/mL spiked sample produce TCA results of 379 and 385 ng/mL in lab 1 and lab 2 respectively. The qualitative assays were screened as positive at 160 ng/mL and 320 ng/mL for the S TAD and Emit® assays, respectively.

Conclusion: Quetiapine cross reacts with quantitative and qualitative TCA immunoassays in a concentration dependent fashion. Therapeutic use or overdose of quetiapine may result in a false-positive TCA immunoassay result.

The following Toxic pearls were also presented at the NACCT meeting:

Body Packing Pellets

Chris Trojan from the DEA discussed the process used by "body packers" to make the drug pellets. The fingers are cut off of latex gloves and packed with drug (heroin). They use a hydraulic jack to compress the powder until it is "rock hard". Then 7-8 layers of latex alternating with tape are applied and finally dipped into dental wax to seal it. The final "packet" or pellet is about 1.5 x 0.5 inches in size. The "body packers" will swallow 25-80 packets and get paid $2000 to $5000 per trip (plus expenses). Heroin powder can be field tested by the DEA with Mecke's Reagent, which turns green if positive. MDMA is also packed into latex, usually 40-50 tablets per pellet and each packer usually carries 1000-2000 tablets.

Is Ricin Fatal?

Ricin is regarded by the lay public and media as one of the most poisonous substances in the world. No cases of human death from ricin could be found. The most cited example of human death from ricin is the Bulgarian defector who died 3 days after being struck in the thigh by a small platinum pellet. No evidence of ricin was found, but the authorities in the case stated "the symptomatology and exceptionally high toxicity for such a small dose made ricin virtually the only choice". There are other case reports of ricin (castor beans) being ingested and causing severe illness (mostly GI symptoms) but not death.

Meet the UPCC Staff

Ed Moltz

Ed came to the UPCC in February 2002. Previously he worked for Lakeview Hospital's Emergency Department and ICU and for Jordan Valley Hospital's Emergency Department. Ed received his bachelor's degree from Weber State University in 2001. He holds certifications in ACLS, PALS, and is an ACLS instructor. Prior to becoming a nurse, Ed worked as a Firefighter/EMT for the South Davis Fire District. Favorite Poisons: Rave drugs (ecstacy, GHB, amyl nitrate, ketamine). Hobbies: Snowboarding, skiing, mountain biking, hiking.

New Employees

The Utah Poison Control Center is pleased to welcome Mary Towns, RN as a poison information specialist, Rachel Crane as a health education intern and Marty Malheiro as the Outreach Poison Education Provider. Mary worked at the University of Utah in the past and is now returning to Utah from Missouri. Rachel is a health education student at the University of Utah. Marty will be graduating with her Masters of Health Promotion and Education from the University of Utah in December 2003.

Employment Opportunities

The UPCC has two open positions. You can find out more about these positions on our website at http://uuhsc.utah.edu/poison/employment.

Utah Poison Control Center Staff

Please send comments and suggestions for future articles to the editor of
UTOX Update at:
585 Komas Dr., Suite 200
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Or send e-mail to poison@hsc.utah.edu

*CSPI denotes Certified Specialist in Poison Information.

Throughout the last few years the UTox Update has covered the following topics:

Methemoglobinemia • Physostigmine • Atypical Antipsychotics • Drug Abuse in Sports • Marijuana • Black Window Spider Envenomation • Serotonin Syndrome • Antivenom Therapy for Snakebites • Marine Envenomations • Kava • Lithium • Ethylene Glycol and Methanol Poisoning • GHB • Jimsonweed • Herbal Ecstasy • Calcium Channel Blockers

If you are interested in reading the UTox Update issue covering one of these topics please visit our website at http://uuhsc.utah.edu/poison and click on the link to Health Professionals. If you have a topic you'd like to see covered in a future issue of UTox Update please send us your idea via email to poison@hsc.utah.edu or call our administrative offices at 587-0600.

Antidote Poster

Thanks to the generous donation of Orphan Medical, the UPCC now has an antidote poster. This poster lists the most common antidotes and recommended stocking levels to provide sufficient drug to treat one adult patient for 24 hours. We will be sending out the posters in the next month. We hope that you find the posters useful and have room to display them. Many thanks to Scott Marshall, PharmD who worked tirelessly with Orphan Medical to design a poster we think will meet the needs of health professionals in Utah. To request copies of the antidote poster, please call (801) 587-0600.

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