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Atypical cases of cycloplegia caused by *Datura stramonium*

Atypické případy cycloplegie způsobené durmanem obecným

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Dear Editor,

Datura stramonium, otherwise also commonly referred to as the "Devil's Trumpet" belongs to the Solanaceae family of plants. It grows largely in height varying from 90 to 120 cm [1] (Fig. 1) [2]. *Datura stramonium* is found within tropical regions globally [3], but it needs to be mentioned, that it occurs in moderate climates as well, and it is not rare even in the Czech Republic. It is an extremely poisonous plant due to the high levels of tropane alkaloids present in the range of 0.2 to 0.6% concentration. Additionally, it contains several other compounds such as hyoscyamine, atropine, scopolamine, apoatropine, and belladonna which are collectively classified as anticholinergics. The flower carries a substantial amount of toxicity, followed by the stem, seed, leaves, and roots of the plant species [4]. The toxic effect of *Datura stramonium* once in contact clinically manifests with mydriasis and cycloplegia by affecting the muscles of the eye, namely the iris muscle and pupillary sphincter muscle. It most often presents unilaterally and is abrupt [4]. Features of mydriasis and cycloplegia can also be similar to blunt trauma to the eye [5], Holmes-Adie pupil [6], oculomotor nerve lesion, and mydriatic drug applications to the eye. We report two cases of cycloplegia caused by *Datura stramonium*.

Fig. 1. *Datura stramonium* [2].
Datura stramonium is an annual, fast-growing weed, reaching a height of up to 120 cm, and is found in gardens, especially in warm regions. It is characterized by pointed ovate leaves on a long petiole with pronounced serrations around the perimeter. Funnel-shaped, large flowers with five petals are white to purple in color.

Obr. 1. Durman obecný [2].
Durman obecný (*Datura stramonium*) je jednoletý, rychle rostoucí plevel, dosahuje výšky až 120 cm a vyskytuje se v zahradách především v teplých oblastech. Typické pro něj jsou špičatě vejčité listy na dlouhém řapíku s výrazným zoubkováním po obvodu. Nálevkovité, velké květy s pěti cípy mají bílou až fialovou barvu.

A 3-year-old girl presented to the Department of Neurology with unresponsive left-sided mydriasis without the presence of photoreaction and no other abnormalities in neurological status. There was a history of the girl plucking garden flowers, suggesting possible local *Datura* intoxication. She was in kindergarten presenting with normal behavior, did not have elevated temperature,

no vomiting, headache, and no history of falls. Upon inspection of the eyes, the palpebral fissures were found to be symmetrical with the normal position of the eyelids. Eyes were freely moving in all directions with no presence of edema or hematoma. No secretion was seen, and the cornea was transparent. On the second day, an MRI of the brain was performed under general anesthesia with normal findings. By the 4th day, the mydriasis resolved, and pupils were isochoric with equipped photoreaction in both eyes.

A 7-year-old girl was referred from the outpatient Department of Ophthalmology to the Department of Neurology with a wide left pupil and no equipped photoreaction. She started to complain of blurry -vision with a foggy mist over her left eye. Later, she started to develop a headache that was more focused on the left side and lasted for 2 h. At the time of the neurological examination, she had no pain and could visualize well. There were no drops administered to her eyes. The reactive mydriasis was suggested because of the local toxic reaction with *Datura* exposure.

The presence of cycloplegia raises suspicion about a wide number of differentials with the new possibility of considering plants within this category. *Datura stramonium* produces a profound effect on the pupil including mydriasis when handled. The plant contains high scopolamine levels resulting in the risk of intoxication and produces other anticholinergic effects such as flushing, diaphoresis, bilateral mydriatic pupils, and confusion. After performing several diagnostic tests in which no abnormalities were seen, it was concluded that cause could potentially be due to the *Datura* species. When the parents of the two children in the case reports were asked whether the children had been in contact with a plant containing toxic substances recently before the onset of symptoms (the targeted question was asked about contact with *Datura stramonium*), it was indeed confirmed by the parents that the children had played in the garden and had been in contact with this plant.

Cultivation of this species should be reconsidered to ensure that these plants cannot be easily accessible to children and prevent cases of anisocoria. Parents need to be informed about the risk of exposure to these plants which can bring about these adverse effects. It will also reduce the use of expensive diagnostic tests that are unnecessary for the diagnosis as the unresponsive mydriatic pupil spontaneously resolves. It is important to note that cycloplegia is not dangerous in itself, but it can be the first sign of intoxication with the risk of progression to a state of unconsciousness, or in the worst case, death. Therefore, these patients should be monitored until the symptoms disappear.

Conflict of interest

The authors declare that there are no conflicts of interest related to this article.

References

1. Kuete V. Physical, hematological, and histopathological signs of toxicity induced by African medicinal plants. In: Kuete V. Toxicological survey of African medicinal plants 1st ed. London, Waltham, MA: Elsevier 2014: 635-657.
2. Durman. [online]. Available from URL: https://pixabay.com/cs/photos/durman-stramonium-jedovat%C3%BD-plevel-844548/
3. Ogunmoyole T, Adeyeye RI, Olatilu BO et al. Multiple organ toxicity of Datura stramonium seed extracts. Toxicol Rep; 6: 983-989. doi: 10.1016/j.toxrep.2019.09.011.
4. Krenzelok EP. Aspects of Datura poisoning and treatment Clin Toxicol (Phila) 2010; 48(2): 104-110. doi: 10.3109/15563651003630672.
5. Serrano F, Stack LB, Thurman RJ et al. Traumatic eye injuries: management principles for the prehospital setting. JEMS 2013; 38(12): 56-62.
6. Sarao MS, Elnahry AG, Sharma S. Adie syndrome. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan.