

# Respiratory Failure, QT<sub>c</sub> Prolongation, and Myoclonic Movements after Massive Pediatric Ondansetron Oral Dissolving Tablet Ingestion

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## Introduction

- Ondansetron is a centrally acting 5-HT<sub>3</sub> receptor antagonist.
  - Weak antagonism of 5-HT<sub>1A</sub>, 5-HT<sub>1B</sub>, and α<sub>1</sub> adrenergic receptors.
- When used for preventing emesis, ondansetron has a well-established safety profile.
- Most common adverse events include headache, malaise, constipation, diarrhea, and dizziness.<sup>1</sup>
- Large, pediatric symptomatic ingestions have not been well described.

## Case Presentation

- A previously healthy 2-year-old female presented after suspected consumption of 58 (36 mg/kg) ondansetron 8 mg oral dissolving tablets (ODT) out a bottle of 60.
- Within one hour of ingestion, the child demonstrated difficulty ambulating, nystagmus, tremors, and sleepiness.
- The patient vomited and had worsening CNS depression, requiring intubation and mechanical ventilation.

## Clinical Course

- Heart rate was 152 and blood pressure was 138/87 with lowest at 80/38.
- Exam significant for tremors, myoclonic jerks, dilated pupils.
- EKG showed sinus tachycardia with QT<sub>c</sub> of 507 ms.
- Electrolytes and hematocrit were within normal limits.
- Venous blood gas: pH 7.23, PCO<sub>2</sub> 56, PO<sub>2</sub> 44, HCO<sub>3</sub> 24
- Acetaminophen and salicylate were undetectable.
- Urine drug screen was negative for amphetamines, opiates, benzodiazepines, tetrahydrocannabinol, and cocaine.
- CT brain demonstrated no acute abnormalities.
- On the following day, the patient became more responsive.
  - Extubated and recovered without sequelae.
  - QT<sub>c</sub> prolongation resolved (442 ms).
- The patient was discharged home with aunt on day 3.

## Case Discussion

- By history, this patient ingested the largest dose reported.
- First pass metabolism is reduced at higher dosages, thus bioavailability increases in overdose.<sup>1</sup>
- The mechanism of toxicity is uncertain but postulated:
  - To increase synaptic serotonin concentrations as a result of 5-HT<sub>3</sub> receptor antagonism and decrease receptor selectivity.
  - To block α<sub>1</sub> adrenergic receptors causing hypotension.
- Overdose experiences are limited with reports exhibiting similar symptoms to our case:
  - 12-month-old infant ingested 5.6-6.4 mg/kg with resultant respiratory failure and tonic-clonic seizure.<sup>2</sup>
  - 8-year-old boy with history of B-cell lymphoma ingested 1.25 mg/kg and developed hypotension requiring norepinephrine.<sup>3</sup>
- In the US, ondansetron ODT is typically dispensed in blister packs.
  - Because of hyperemesis gravidarum, the child's mother obtained a bottle of 60 ondansetron ODT without blister packaging from a foreign pharmacy.
- The ODT formulations have flavoring agents in the tablet making them palatable to children.
  - Zofran ODT – Strawberry flavor<sup>4</sup>



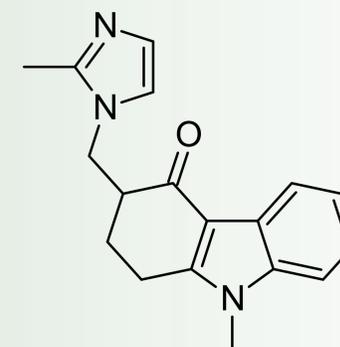
–Lake Erie Medical Supply Generic ODT – Peppermint flavor<sup>4</sup>

## Limitations

- Levels were unable to be obtained to confirm ondansetron exposure.
- Single case report cannot establish causality.

## Conclusion

- Because of flavoring and rapid oral dissolution, ondansetron ODT can be attractive to children and result in severe consequences.
- Appropriate packaging such as blister packs may deter children from significant ingestion.
- In our patient, toxicity manifested as CNS depression requiring intubation, QT<sub>c</sub> prolongation, hypotension, and symptoms of serotonin excess.



## References

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## Disclosure

- Authors of this report have no financial conflict of interest.

