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Bradycardia and Hypotension after 20 mg of IV Olanzapine

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Background: Olanzapine is a second generation antipsychotic available as an immediate-release formulation that is FDA approved for intramuscular use only. This same formulation of olanzapine, however, is increasingly being used intravenously (IV). The maximum studied IV dose in published literature is 10 mg; scant data are available on larger IV doses. Therapeutic doses of olanzapine have minimal cardiovascular effects. Postural hypotension from α_1-adrenergic blockade with reflex tachycardia is well described, however simultaneous bradycardia and hypotension are also reported.

Hypothesis: Large doses of IV olanzapine may result in bradycardia and hypotension.

Methods: This is a single patient chart review. A 25-year-old man presented to the emergency department acutely agitated after sustaining a stab wound to his abdomen. Initial vital signs were as follows: pulse 114 beats/minute, blood pressure 154/83 mmHg, pulse oximetry 100%. His hospital stay was not complicated by hemorrhagic shock. His agitation was treated with 20 mg of IV olanzapine given in two 10 mg doses eight minutes apart. He also received 10 mg of IV haloperidol 18 minutes after the first olanzapine dose.

Results: The patient became sedate, hypotensive and bradycardic approximately 20 minutes after the first olanzapine dose. Vital signs at that time were as follows: pulse 47 beats/minute, blood pressure 86/38 mmHg, pulse oximetry 92%. An ECG confirmed sinus bradycardia. Labs revealed a serum potassium of 2.8 mEq/L and a blood ethanol concentration of 128 mg/dL. Interventions included electrolyte replacement, 2 liters of IV crystalloid, and supplemental oxygen. Vital signs normalized without additional interventions one hour later.

Discussion: Reports of bradycardia accompanied by hypotension after administration of olanzapine have been reported after both therapeutic dosing and overdose, though rarely. No clear causative mechanism is known for this phenomenon, though sympatholysis has been posited. As IV use of olanzapine becomes more common, clinicians should be aware of and monitor for bradycardia as escalating doses are administered. As with previously reported cases of bradycardia associated with olanzapine, this patient responded well to supportive care.

Conclusion: Clinicians should monitor for bradycardia and hypotension after the administration of large doses of IV olanzapine.