

2,4 Dinitrophenol Associated Hyperthermia Treated Successfully with Dantrolene

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Background: 2,4 Dinitrophenol (DNP) has well known toxicity. Dantrolene has been successfully used in a single case report. We report another case of dantrolene use for DNP associated hyperthermia.

Case report: 22 year old previously healthy male was found confused and diaphoretic. Upon arrival to the Emergency Department, he related that 4 hours prior he had taken a double dose of his bodybuilding supplements. Bottles provided included hydroxyzine, creatine, taurine, levothyroxine, and DNP.

On presentation, his initial vital signs were normal other than mild tachycardia at 113 bpm. He was confused, diaphoretic and tremulous. The remainder of exam was unremarkable.

Initial laboratory evaluation: Sodium 139 mmol/L, Potassium 4.1 mmol/L, Chloride 109 mmol/L, CO₂ 18 mmol/L, BUN 34 mmol/L, Creatinine 2.11 mmol/L, Glucose 499 mg/dL, TSH and T4 both in normal range, and Creatine phosphokinase 456 units/L.

Toxicology testing including ethanol, acetaminophen, aspirin, and urine drug screen containing amphetamine, methamphetamine, barb, benzo, cannabinoid, cocaine, opiate, PCP were negative.

8 hours after hospital arrival, he was increasingly disoriented with severe respiratory distress. His vital signs were: T 38.6°C; HR 113 bpm; BP 114/45; RR 63 breaths/min; oxygen saturation 97% on 4 Liters of oxygen. He required intubation for respiratory failure. He was given dantrolene 180 mg intravenously. Temperature reached a maximum of 40.0°C. He received two additional doses of dantrolene over the next 10 hours for a total of 7 mg/kg. Hyperthermia resolved. He was extubated on hospital day #4 and discharged on hospital day #6 in good condition.

Discussion: DNP has had a rise in popularity due to internet availability. DNP causes uncoupling of oxidative phosphorylation and clinical effects include hyperthermia, tachycardia, diaphoresis, and in fatal cases cardiovascular collapse. Dantrolene has been successfully used in a single published case report to our knowledge. Dantrolene may ameliorate the hypermetabolic state in DNP toxicity by lessening excitation-contraction coupling in muscle cells and thus attenuate hyperthermia.

Conclusion: We present a case of DNP associated hyperthermia, successfully treated with dantrolene in addition to good supportive measures. This case adds to the sparse existing published evidence for the use of dantrolene in DNP toxicity.