

Methylene blue utilization: a poison center's experience

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Background:

Methylene blue (MB) is used primarily in the treatment of acquired methemoglobinemia. Additionally, MB has been used for refractory hypotension in drug overdose and vasoplegic shock, as it inhibits the vasodilatory effects of nitric oxide at vascular smooth muscle.

Methods:

We performed a retrospective record review from a poison control center between June 2006 and September 2016, including calls where MB was recommended and/or administered. Abstracted data included: patient's age, exposures, context, therapies, and outcomes.

Results:

42 cases met inclusion criteria. Methemoglobinemia was the indication for MB recommendation in 35 (83.3%) cases, and refractory hypotension in 7 (16.7%) cases.

Of 35 cases of methemoglobinemia, the following drugs were implicated: local anesthetics (n=17, 48.6%), phenazopyridine (n=5, 14.3%), nitrites (n=5, 14.3%), dapsone (n= 4, 11.4%), naphthalene (n=1, 2.9%), and sodium chlorite (n=1, 2.9%). Causative agents were not identified in 2 cases.

Patients with methemoglobinemia ranged from 1 to 87 years in age. 19 (54.3%) cases were attributed to adverse drug reactions, 3 (8.6%) to intentional abuse, and 3 (8.6%) to suicide attempts. Methemoglobin levels were reported in 28 cases; initial levels ranged from 3.7% to 68.5%.

MB was administered in 34 cases. 30 (88.2%) of these patients were admitted, and 4 (11.8%) were discharged from the emergency department. 31 (91.2%) patients survived. Final outcome was not reported in the remaining patients.

Of the 7 cases of refractory shock, 6 were due to intentional polysubstance ingestion. Drugs implicated include: amlodipine, diltiazem, carvedilol, ethanol, benzodiazepines, and metformin. MB was administered in 4 cases; 2 survived, 1 died, and the outcome was not reported in 1. MB was not administered in 2 patients, both of which survived.

In one case of refractory shock, MB was recommended for suspected potassium nitrate overdose. The patient died, but no further data was available.

Discussion/Conclusion:

Review of a poison center's data demonstrates that MB is most commonly recommended for methemoglobinemia, and occasionally for treatment of refractory hypotension. Poison centers and medical toxicologists may consider MB for treatment of refractory shock following overdose not responsive to standard therapies. Further research should be pursued regarding MB use in refractory shock.