Toxicology: A Case of Neuroleptic Malignant Syndrome

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Abstract: A case of neuroleptic malignant syndrome is described. Presentation, treatment options, and specific pharmacotherapy are reviewed.

MeSH Words: Neuroleptic Malignant Syndrome, Dantrolene, rhabdomyolysis,

Case History

A 66 year-old male was brought to the Emergency Department by ambulance with a chief complaint of an unsteady gait. He was alert and oriented during triage assessment and examination by the emergency physician.

During this time he described seeing a psychiatrist two weeks previously for anxiety and being prescribed clonazepam, paroxetine and olanzapine. He also stated that he experienced one fall about four days before and one fall the night before presenting to the Emergency Department.

About two hours after initial assessment and resuscitation, his level of consciousness declined to a GCS of 8 and he was febrile. His lab results were significant for a creatinine phosphokinase (CK) of 164,194 units/L, aspartate aminotransferase (AST) of 816 units/L, alanine aminotransferase (ALT) of 217 units/L, lactate

dehydrogenase (LD) of 1677 units/L and a serum creatinine of 116 mcmol/L. A provisional diagnosis Neuroleptic Malignant Syndrome (NMS) was made.

The patient was resuscitated with IV fluids, started on dantrolene 2 mg/kg (140 mg) IV x 1 dose followed by 1 mg/kg (70 mg) IV q6h and transferred to the ICU. His level of consciousness fluctuated over the first afternoon. He did not require intubation and gradually improved over the next few days. His previously abnormal lab results returned to within normal limits, except for the LD, which remained elevated at 291 units/L. Dantrolene was discontinued and he was transferred to a medical ward. He was seen by the psychiatry service, which deemed further treatment of his alleged anxiety disorder unnecessary. The patient was discharged two weeks after initial presentation.

Discussion

Neuroleptic Malignant Syndrome (NMS) is a rare adverse reaction to antipsychotic medications characterized by muscle rigidity and elevated temperature. Other possible clinical features include altered mental status, excessive sweating, incontinence, tremor, hemodynamic instability. Lab results may reveal a high CK and white blood cell count. It is more commonly reported in elderly patients and can occur with newer or older antipsychotic drugs, including atypical agents. Other risk factors include psychomotor agitation, maximum, mean and total dose of neuroleptic, rate of dose increase, and number of IM injections.

Major complications of NMS include respiratory and renal failure. Rhabdomyolysis and disseminated intravascular coagulation may accompany renal failure. Mortality estimates range from 4 to 22%. [1]

Treatment of NMS begins with immediate discontinuation of the antipsychotic medication and supportive therapy. Pharmacologic agents that have been used include dantrolene, bromocriptine, amantadine and benzodiazepines with electroconvulsive therapy. Since there have been no well-designed studies conducted, treatment guidelines are not available.

The information currently available on the treatment Malignant Hyperthermia (MH) helps guide treatment of NMS with dantrolene.

Dantrolene is a skeletal muscle relaxant that has been proven to reduce mortality in patients suspected to have MH during anaesthesia. There are no contraindications to giving dantrolene for NMS. The most common adverse reactions from one study included muscle weakness, phlebitis, respiratory failure and GI discomfort. Doses used for NMS should be similar to those used for MH. [2]

Administration is complicated by the large volumes of sterile water for injection (SWFI) required for reconstitution of the drug. Dantrolene is available in 20 mg vials, each of which must be reconstituted with 60 mL of SWFI. After patient stabilization on IV therapy it may be possible to switch to oral therapy. The duration of therapy is usually three days total.

References

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