

Intramuscular vs. Intravenous Prehospital Treatment of Status Epilepticus

IM midazolam was superior to IV lorazepam for terminating seizures before arrival at the emergency department.

A 2001 trial ([JW Emerg Med Oct 4 2001](#)) established the value of intravenous (IV) benzodiazepines for treatment of prolonged seizures in the prehospital setting, but prehospital personnel often use intramuscular (IM) midazolam for this purpose when they cannot establish IV access. Researchers compared the efficacy of the IM and IV routes in a randomized, double-blind noninferiority trial involving 33 emergency medical services systems.

Adults and children estimated to weigh >13 kg were enrolled if they were having convulsive seizures at the time of paramedic treatment and were reported to have been convulsing either continuously for ≥ 5 minutes or intermittently for ≥ 5 minutes without regaining consciousness. The researchers randomized 893 patients to receive either 10 mg IM midazolam by autoinjector followed by IV placebo or IM placebo by autoinjector followed by 4 mg IV lorazepam. Children estimated to weigh <40 kg received 5 mg of midazolam or 2 mg of lorazepam.

The incidence of termination of seizures without rescue therapy before arrival at the emergency department (the primary endpoint) was 73% in the IM-midazolam group versus 63% in the IV-lorazepam group ($P < 0.001$ for both noninferiority and superiority). The study drug was not administered to 7% in the IV group because of difficulty obtaining vascular access and to 1% in the IM group because of autoinjector malfunction. Rates of intubation and seizure recurrence were similar in the two groups.

Comment: Prehospital protocols should instruct use of intramuscular midazolam as the primary treatment for prolonged seizure activity not caused by a correctable condition, such as hypoglycemia. For emergency department and hospitalized patients with IV access, either IM midazolam or IV lorazepam may be used.

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