

Neuromuscular Blockade by Nitrogen Mustard

To the Editor—In a recent article, Bennett *et al.*¹ reported that thio-tepa administration to an anesthetized patient with myasthenia gravis produced prolonged impairment of neuromuscular and respiratory functions which was refractory to treatment with neostigmine or edrophonium. This letter is to suggest a possible mechanism for the neuromuscular impairment following thio-tepa. The aziridinium ion of choline mustard (methyl-2-hydroxyethyl-2'-chloroethylamine), a product of the hydrolysis of nitrogen mustard, inhibits choline uptake² and produces a long-lasting, hemicholinium-like neuromuscular blockade which is not significantly improved by treatment with physostigmine.³ This would explain the mechanism of the neuromuscular impairment observed to result from nitrogen mustards.⁴ A similar action may be common to thio-tepa and could account for the prolonged paralysis observed by Bennett.¹ This effect of nitrogen mustard combined with the pre-

existing myasthenia gravis may be the cause of this complication.

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