

REFERENCES

1. Carrof SN, Rosenberg H, Fletcher JE, Heiman-Patterson TD, Mann SC: Malignant hyperthermia susceptibility in neuroleptic malignant syndrome. *ANESTHESIOLOGY* 67:20-25, 1987
2. Geduschek J, Cohen SA, Khan A, Cullen BF: Repeated anesthesia for a patient with neuroleptic malignant syndrome. *ANESTHESIOLOGY* 68:134-137, 1988
3. Ward A, Chaffman MO, Sorkin EM: Dantrolene—A review of its pharmacodynamic and pharmacokinetic properties and therapeutic use in malignant hyperthermia, the neuroleptic malignant syndrome and an update of its use in muscle spasticity: *Drug* 309:416-418, 1983
4. Yacoub OF, Morrow DH: Malignant hyperthermia and ECT. *Am J Psychiatry* 143:1027-1029, 1986
5. Pope HG Jr, Keck PE, McElroy SL: Frequency of neuroleptic malignant syndrome in a large psychiatric hospital. *Am J Psychiatry* 143:1227-1233, 1986
6. Hermesh H, Aizenberg D, Lapidot M, Munitz H: The risk of malignant hyperthermia among neuroleptic malignant syndrome patients and their families. *Am J Psychiatry*, in press
7. Krivosic-Horber R, Adent P, Guevart E, Theunynck D, Lestavel P: Neuroleptic malignant syndrome and malignant hyperthermia. *Br J Anaesth* 59:1554-1556, 1987

(Accepted for publication October 5, 1988.)

Anesthesiology
70:172-173, 1989

In Reply.—We appreciate the interest of Dr. Hermesh and associates in our article on the relationship between neuroleptic malignant syndrome (NMS) and malignant hyperthermia (MH).¹ In our study, we found *in vitro* contracture responses consistent with MH-susceptibility in five of seven NMS patients. These results resemble those of Araki *et al.*² who reported MH-like caffeine contractures in skeletal muscle from six of eight NMS patients. In contrast, Krivosic-Horber *et al.*³ reported one MH-equivocal and five MH-negative contracture responses in muscle from six NMS patients. As discussed in our article, this disparity of findings may reflect the lack of standardization of methodology or a lack of specificity of *in vitro* contracture testing in muscle taken from patients with neuromuscular disorders. Other studies have shown similar abnormalities in the contracture response to halothane and caffeine among patients with myopathic or neurogenic disorders.⁴ Further controlled investigations may clarify whether these responses imply clinical MH-susceptibility or represent non-specific effects of diseased muscle.

As reviewed in our article, several lines of evidence suggest that NMS and MH are triggered by different mechanisms that culminate in a similar dantrolene-responsive hypermetabolic state. This is supported by the attenuation of MH in swine by neuroleptics, the ameliorating effect of depolarizing muscle relaxants and centrally active dopamine agonists in NMS, the absence of familial susceptibility to MH in NMS patients, and reports of the safe use of triggering anesthetics in NMS patients.¹ Based on a retrospective review of the uneventful use of succinylcholine with and without halothane in 20 NMS patients, Hermesh *et al.* provide additional evidence against MH-susceptibility in NMS patients. However, it would be important to know more about these procedures, *e.g.*, the duration and dosages of all drugs administered, monitoring techniques, perioperative complications, etc. Furthermore, in retrospective studies, up to 70% of MH-susceptible patients did not develop hyperthermia during general anesthesia administered on previous occasions.⁵

In terms of anesthetic management, there is certainly no reason to withhold life-saving surgery from either NMS- or MH-susceptible patients. In addition, the risk of MH in a recovered NMS patient during ECT seems negligible, since MH has never been reported as a complication of this procedure in any patient. This may be due to the brief exposure to succinylcholine, the absence of inhalational agents, or the suppressive effect of barbiturates used for anesthesia during ECT.⁶ Nevertheless, a careful approach to anesthesia may be warranted, especially for patients in the midst of NMS episodes, since these metabolically unstable patients may be at risk for anesthetic-related complications apart from MH.^{7,8}

Additional studies that correlate *in vitro* testing and use of anesthesia in NMS patients may be worthwhile in determining anesthetic risk associated with NMS and the potential for cross-reactivity between MH and NMS.

STANLEY N. CAROFF, M.D.
Associate Professor

STEPHAN C. MANN, M.D.
Clinical Assistant Professor
Department of Psychiatry

University of Pennsylvania
Philadelphia, Pennsylvania 19104

HENRY ROSENBERG, M.D.
Professor and Chairman

JEFFREY E. FLETCHER, PH.D.
Assistant Professor
Department of Anesthesiology
Hahnemann University
Philadelphia, Pennsylvania 19102

TERRY D. HEIMAN-PATTERSON, M.D.
Assistant Professor
Department of Neurology

Thomas Jefferson University
Philadelphia, Pennsylvania 19107

REFERENCES

1. Caroff SN, Rosenberg H, Fletcher JE, Heiman-Patterson TD, Mann SC: Malignant hyperthermia susceptibility in neuroleptic malignant syndrome. *ANESTHESIOLOGY* 67:20-25, 1987
2. Araki M, Takagi A, Higuchi I, Sugita H: Neuroleptic malignant syndrome: Caffeine contracture of single muscle fibers and muscle pathology. *Neurology* 38:297-301, 1988
3. Krivosic-Horber P, Adnet P, Guevort E, Theunynck D, Lestavel P: Neuroleptic malignant syndrome and malignant hyperthermia. *Br J Anaesth* 59:1554-1556, 1987

4. Heiman-Patterson TD, Rosenberg H, Fletcher JE, Tahmouh AJ: Halothane-caffeine contracture testing in neuromuscular diseases. *Muscle Nerve* 11:453-457, 1988
5. Britt BA, Kalow W: Malignant hyperthermia: A statistical review. *Can Anaesth Soc J* 17:293-315, 1970
6. Gronert GA, Milde JH: Variations in onset of porcine malignant hyperthermia. *Anesth Analg* 60:499-503, 1981
7. George AL, Wood CA: Succinylcholine-induced hyperkalemia complicating the neuroleptic malignant syndrome. *Ann Intern Med* 106:172, 1987
8. Hughes JR: ECT during and after the neuroleptic malignant syndrome: Case report. *J Clin Psychiatry* 47:42-43, 1986

(Accepted for publication October 5, 1988.)

Anesthesiology
70:173, 1989

Appropriate Facilitation of Intravenous Regional Techniques in RSD

To the Editor:—Gargiulo described the use of epidural sympathetic blockade to facilitate venous access in a patient with reflex sympathetic dystrophy.¹ We have used the local application of nitropaste ointment for the same purpose.²

A patient with lower extremity reflex sympathetic dystrophy diagnosed by prolonged pain relief from sympathetic blockade was scheduled for intravenous regional bretylium blockade. We used repeated epidural blocks, as described by Gargiulo,¹ to perform regional bretylium blocks on this patient. On one occasion, we could not achieve epidural blockade, and we applied nitroglycerin ointment directly to the skin over the vein to be cannulated, removing the excess paste after several seconds. The vessel promptly dilated, became visible, and was successfully cannulated with a 22-gauge catheter.

Hecker *et al.*² first described nitroglycerin ointment as an aid to venipuncture in adult patients. In that study, 50 patients were randomly allocated to two groups and observed for the difference in those patients with nitroglycerin ointment and those without. The degree of difficulty in cannulation on a scale of 1 (very easy) to 5 (failure) was scored and, in patients with nitroglycerin paste, venous cannulation was almost twice as easy compared with those without. Apart from tingling of the skin of the treated patients, no side effects were noted. Vaksman³ noted that nitroglycerin ointment was an aid to venous cannulation in children less than 1 yr of age, but not advantageous in children 1-10 yr of age. The age limitation was not explained.

In summary, topical nitroglycerin may be an effective, simple, low-risk method to produce dilatation of veins in patients with RSD.

KEVIN FOLEY, B.S.
Medical Student

*Medical College of Wisconsin
Milwaukee, Wisconsin 53226*

LINDA SCHATZ, M.D.
*Anesthesiology Resident
Department of Anesthesiology*

RANDALL L. MARTIN, M.D.
Assistant Professor of Anesthesiology

*The Oregon Health Sciences University
Portland, Oregon 97201*

REFERENCES

1. Gargiulo RF: A method of facilitating intravenous regional bretylium. *ANESTHESIOLOGY* 69:147, 1988
2. Hecker JF, Louis GPH, Stanley H: Nitroglycerin ointment as an aid to venepuncture. *Lancet* 1:332-333, 1983
3. Vaksman G, Rey C, Vereviere GM, Smadja D, Dupuis C: Nitroglycerin ointment as an aid to venous cannulation in children: Clinical and laboratory observations. *J Pediatr* 3:89, 1987

(Accepted for publication October 6, 1988.)

ANNOUNCEMENT

The American Board of Anesthesiology (ABA) will administer its third written examination in **Critical Care Medicine** at an airport near Chicago, Illinois, on Friday, September 22, 1989. Diplomates of the ABA who apply and are judged to be qualified by virtue of their additional training or experience in Critical Care Medicine will be accepted for examination. An application may be requested by writing to the Secretary, American Board of Anesthesiology, 100 Constitution Plaza, Hartford, Connecticut 06103-1721. The deadline for receipt of completed applications in the Board office is June 10, 1989.