An Unusual Sensitivity to \textit{d}-Tubocurarine

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The following case report describes a patient who manifested an unexpected sensitivity to \textit{d}-tubocurarine. The patient was given curare 3 mg. Shortly thereafter, she became apneic and required ventilatory resuscitation.

\textbf{REPORT OF A CASE}

A 22-year-old Caucasian woman, gravida II, para 1, was admitted to the labor ward in active labor. Past history was remarkable in that she had had idiopathic thrombocytopenic purpura which necessitated splenectomy a year prior to admission. She had not received steroids since the operation, and there was no evidence of residual disease. Twenty-one months prior to admission, she had had a cesarean section because of cephalopelvic disproportion. She denied cardiorespiratory problems, allergies or other illnesses. She denied adverse reactions to previous anesthetics. She weighed 75 kg. Blood pressure was 120/88 mm Hg, temperature 98 F, pulse 78/min, and respiratory rate 18–22/min. The heart and lungs were normal.

The patient was scheduled for elective cesarean section and prepared for general anesthesia. Immediately prior to the induction of anesthesia, \textit{d}-tubocurarine, 3 mg, was given intravenously to prevent succinylcholine-induced fasciculations. One minute after the administration of \textit{d}-tubocurarine, before any other medication had been given, the patient manifested unusual behavior. She began moving her arms and legs in an uncoordinated fashion, an apparent panic reaction. She was still fully conscious but soon lost the ability to communicate. Paralysis and apnea ensued. We were able to ventilate the lungs without difficulty via a face mask. Thiopental sodium, 200 mg, was given, and the trachea was intubated without need of additional relaxant drugs. During laryngoscopy, the vocal cords were noted to be abducted, and the patient did not react to the endotracheal tube. Anesthesia was maintained with nitrous oxide–oxygen 4:2 l/min; no supplemental anesthetic agent was needed. Within 10 minutes, a male infant was delivered. Apgar scores were 7 and 10 at 1 and 5 minutes, respectively. Thirty-five minutes later, \textit{d}-tubocurarine, 1.5 mg, was injected to facilitate closure of the abdomen. A stimulator was then attached to the wrist over the ulnar nerve. Fifty-five minutes after the beginning of the operation, the block was antagonized. Neostigmine, 1 mg iv, produced a gradual increase in twitch tension; an additional 1 mg resulted in a stronger twitch, sustained tetanus, and absence of posttetanic facilitation. The patient was carefully observed in the recovery room and showed no signs of muscular weakness.

Four days after the cesarean section the patient was seen in consultation with the neurology service. At this time, she denied all evidence of neuromuscular disease, weakness, or easy fatigability. She related a several-year history of occasional episodes of diplopia, usually occurring after long drives or after prolonged periods of reading. Examination by the neurologist was entirely within normal limits. She was able to do repetitive exercises with no decrease in strength. A challenge with \textit{d}-tubocurarine, 0.5 mg iv, produced diplopia with paralysis of upper outer gaze. \textit{d}-Tubocurarine, 1.5 mg, produced marked weakness of grip strength and loss of ability to raise the head from the horizontal position. The patient had no respiratory distress or hypotension. The challenge was terminated with neostigmine.

The patient was discharged with an appointment in the Neurology Clinic, but she failed to return and was lost to follow up.

\textbf{DISCUSSION}

The administration of a subparalytic dose of \textit{d}-tubocurarine prior to succinylcholine is a fairly common practice among anesthesiolo-
gists. The purpose of this treatment in this patient was to reduce the likelihood of post-
succinylcholine muscle pain. Other suggested
reasons for giving d-tubocurarine prior to suc-
cinylcholine include prevention of increases in
intraocular pressure\(^2\) or intragastric pres-
sure\(^3\,\!^5\) and prevention of a hyperkalemic
response.\(^6\) The effectiveness of the latter has
been challenged.\(^7\)

The use of d-tubocurarine prior to succinyl-
choline is not without problems. Several in-
vestigators have shown that succinylcholine is
less effective in producing relaxation when
given after d-tubocurarine.\(^8\,\!^9\) In order to get
the same intensity of paralysis, a 50 per cent
increase in succinylcholine dose must be
given. A question concerning an alteration in
the nature of the neuromuscular block when
succinylcholine is given after d-tubocurarine
has also been raised. While we know of no
published report of prolonged paralysis from
succinylcholine as a result of its being given
after 3 mg d-tubocurarine, Walts \textit{et al.}\(^9\) have
described a case in which there was a marked-
edly delayed recovery from succinylcholine
when it was given late in an operation in which
d-tubocurarine had been used as the primary
relaxant.

The problem presented in this case illus-
trates another potential hazard—unexpected
paralysis from a small dose of d-tubocurarine.
In their early human studies with d-tubocura-
rine, Pelikan \textit{et al.}\(^10\) found that the response to
any dose was unpredictable. They reported
that 3 to 4 per cent of normal patients have
a threshold to d-tubocurarine similar to that
of patients with myasthenia gravis. Katz\(^11\) re-
corded twitch responses in 100 patients given
d-tubocurarine, 0.1 mg/kg. He found that while
the usual response to this dose was 40 to 70
per cent paralysis of twitch tension, 7 per cent
had complete paralysis.

Sanger and Kinyon reported an episode of
sensitivity to d-tubocurarine in a patient with
unrecognized myasthenia gravis.\(^12\) It might be
argued that our patient does, indeed, have
myasthenia gravis. However, we believe there
is no basis for making this diagnosis at this time
because the patient essentially has no clinical
symptom and requires no therapy.

Judging from the failure to find other reports
such as ours, we must conclude that the ex-
tent of sensitivity manifested by this patient is
rare. We present this case report to alert anes-
thesiologists that, although rare, such a
reaction is not unknown. Even small doses of
d-tubocurarine should not be administered
in the absence of equipment for resuscitation.
Patients given d-tubocurarine, regardless of the
dose, should never be left unobserved.

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