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An Anaphylactoid Response to a Small Dose of *d*-Tubocurarine

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The release of histamine has been a recognized side effect of *d*-tubocurarine for many years. Since Alam *et al.*[1] demonstrated in 1939 that intra-arterial injections of *d*-tubocurarine in dogs resulted in the release of histamine from muscle, bronchoconstriction and hypotension occasionally observed with use have been attributed to this phenomenon.[2,3] There are isolated reports of anaphylactoid reactions to large doses of *d*-tubocurarine, presumed to represent exaggerated histamine release.[4,5] We recently encountered a case in which bronchospasm, generalized erythema, and circulatory collapse followed a small, preintubation dose of *d*-tubocurarine.

REPORT OF A CASE

A 26-year-old white woman, was admitted for vaginal hysterectomy. The medical history was significant for heavy smoking, previous intravenous drug abuse, and several gynecologic procedures, for which the patient had received general anesthesia by mask, as well as spinal anesthesia, without difficulty. Results of physical examination were unremarkable.

Preanesthetic medication consisted of diazepam, 10 mg, orally, morphine, 12 mg, im, and pentobarbital, 120 mg, im, given an hour prior to arrival of the patient in the operating room. Blood pressure of 110/70 torr was obtained during preoxygenation. There was no change in blood pressure following a test dose of thiopental, 50 mg, iv. The patient was then given *d*-tubocurarine, 3 mg, iv, in anticipation of endotracheal intubation with the use of succinylcholine. She immediately began to complain of itching and difficulty in breathing. There was an audible wheeze, and a generalized erythematous reaction was noticed. Blood pressure dropped to 70/40 torr. Since the patient had become quite agitated, it was elected to give thiopental, 100 mg, iv, and administration of halothane, 1 per cent by mask, was started in an effort to relieve bronchospasm. Immediately thereafter the blood pressure became unobtainable, the ECG showing sinus tachycardia at a rate of 140 beats/min. Halothane was turned off, less than a minute after its initiation, and the patient was given 100 per cent oxygen. Ephedrine, 25 mg, iv, was administered, whereupon the blood pressure became measurable at 50/30 torr. Over the next 15 min the patient received three additional doses of ephedrine, 25 mg, each, as well as 1,000 ml of lactated Ringer's solution containing hydrocortisone, 100 mg, and diphenhydramine, 25 mg. At this point the blood pressure was 90/60 torr, and the patient was breathing easily but remained erythematous.

The operation was cancelled and the patient taken to the recovery room, where her condition remained stable, with a blood pressure of 110/70 torr and a pulse rate of 100 beats/min. A blood sample drawn in the operating room within minutes of cardiovascular collapse for determination of histamine level was not processed due to laboratory error. A second sample drawn two hours later in the recovery room showed a histamine level of 2.2 μg/dl (normal 4–7 μg/dl).

Vaginal hysterectomy was performed the next day by use of spinal anesthesia and intermittent doses of thiopental for sedation (425 mg in 90 min), without complication. Due to inadequate surgical hemostasis, the patient was returned to the operating room 18 hours later and underwent an emergency pelvic laparotomy for evacuation of blood clots and hemostasis during general anesthesia, using thiopental for induction of anesthesia, succinylcholine for endotracheal intubation, pancuronium for abdominal relaxation, and halothane and nitrous oxide for maintenance of anesthesia. There was no complication during this anesthetic experience.

DISCUSSION

The patient showed no hemodynamic change in response to a 50-mg test dose of thiopental, but experienced generalized erythema, wheezing, and a reduc-

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tion in blood pressure from 110/70 torr to 70/40 torr within a minute of administration of a preintubation dose of *d*-tubocurarine. Administration of an additional 100 mg of thiopental and 1 per cent halothane by mask to combat agitation aggravated the cardiovascular collapse, blood pressure dropping from 70/40 torr to unobtainable levels. The patient had no untoward reaction to thiopental, succinylcholine, and pancuronium during her subsequent anesthetic exposures. An attempt was made to document her hypersensitivity by further testing, but the patient was unwilling to cooperate. It should be noted that hypersensitivity to *d*-tubocurarine is difficult to detect by skin tests, since intradermal injections of *d*-tubocurarine produce wheal-and-flare reactions in all subjects tested.[6]

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Right Bundle-branch Block and Complete Heart Block Caused by the Swan-Ganz Catheter

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Pulmonary-artery catheterization for hemodynamic monitoring has found widespread acceptance since the introduction of the balloon-tipped, flow-directed catheter by Swan and Ganz.[1] Transient right bundle-branch block with insertion of the catheter has been reported to occur in patients with acute myocardial infarction.[2] This complication, however, was thought to be extremely rare, since the soft, flexible, balloon-tipped catheters do not carry the same risk of injury to the cardiac conduction system as do conventional cardiac catheters.[3,4] This report documents a high incidence of right bundle-branch block (RBBB) occurring during Swan-Ganz catheterization of the pulmonary artery in patients with stable coronary-artery disease. We also report the occurrence of the potentially fatal complication of complete heart block (CHB) associated with Swan-Ganz catheterization of two patients, with pre-existent left bundle-branch block (LBBB).

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Methods

We recorded serial 12-lead electrocardiograms (ECGs) during the peri-induction period in 46 patients with severe coronary-artery disease (CAD) undergoing anesthesia for elective coronary bypass procedures. Bundle-branch block (BBB) was not present in any patient during the control period. The ECG was recorded prior to and immediately following insertion of the Swan-Ganz catheter via the right internal jugular vein, in awake, premedicated patients. Further ECGs were recorded during induction of anesthesia. ECG leads II and V5 were monitored continuously during anesthesia and operation.

Results

Partial RBBB was apparent immediately following insertion of the Swan-Ganz catheter (fig. 1) in two of