Monoamine oxidase inhibitors and elective surgery

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■ Monoamine oxidase inhibitor use is considered a contraindication for elective surgery. We reviewed 32 patients on a regimen of isocarboxazid 10 mg daily who underwent elective surgery. Their anesthetic management, postanesthesia outcome, and pharmacology are described.

□ INDEX TERMS: MONOAMINE OXIDASE INHIBITORS; JOINT PROSTHESIS; ARTHRITIS, RHEUMATOID; PREOPERATIVE CARE
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THE USE OF MONOAMINE oxidase inhibitors (MAOIs) has long been considered a contraindication to elective surgical procedures. Both current practice and standard references advocate discontinuing MAOIs for 2 weeks before elective surgery with anesthetics.[1,2] The reason is that intraoperative use of sympathomimetic drugs and certain narcotics may cause hemodynamic instability, hyperpyretic coma, or neurological symptoms. However, recent reports suggest that patients taking MAOIs can be anesthetized safely for elective procedures without discontinuing the drug.[3,4] We retrospectively reviewed the anesthesia records of patients suffering from rheumatoid arthritis who had elective surgery while on chronic MAOI therapy to facilitate pain relief and mobility.

METHODS

We reviewed the medical records of 1000 patients scheduled for joint replacement due to rheumatoid arthritis between 1973 and 1976. We examined factors such as age, sex, number of anesthetics, preoperative medication, induction agents, intraoperative blood pressure measurements, postoperative complications, and length of stay in the postanesthesia care unit.

Ten men and 22 women ages 41 to 77 who were on a regimen of isocarboxazid 10 mg/day for longer than 1 month had a total of 51 anesthetics. Premedication consisted of combinations of meperidine, morphine, atropine, and hydroxyzine (*Table*). Forty-six general anesthetics and five regional anesthetics were administered. The induction agents for general anesthetic were thiopental (40 instances) and ketamine (6 instances). Anesthesia was maintained with an inhalational anesthetic with or without a muscle relaxant and supplemental narcotic in some cases. Regional anesthetics included spinal anesthesia and the axillary technique of brachial plexus blocks.

RESULTS

Intraoperative hypotension (mean arterial pressure 30% lower than preoperative baseline) for periods of 10 to 20 minutes was recorded in five patients; they responded to fluids, surgical stimulation, and, in one patient, methoxamine. Hypertension (mean arterial pressure 30% higher than preoperative baseline) for a 10-minute period was recorded in one patient. Other changes in mean arterial pressure lasted less than 5

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TABLE
PREMEDICATION REGIMENS

Drug combination	Number of patients
Meperidine 25 to 75 mg Atropine 0.4 mg	6
Meperidine 50 to 75 mg Atropine 0.4 mg Hydroxyzine 25 to 75 mg	35
Meperidine 50 mg Hydroxyzine 50 mg	4
Morphine 5 to 10 mg Atropine 0.4 mg	3
Hydroxyzine 25 to 50 mg Atropine 0.4 mg	3

minutes. Bradycardia (heart rate 40 to 45 beats per minute) requiring a single dose of atropine was recorded in four patients. No postoperative complications were attributed to interaction between the MAOI and the drugs administered perioperatively. Hemodynamics and length of stay in the recovery room did not differ between these patients and patients not on MAOIs.

DISCUSSION

Patients with rheumatoid arthritis may suffer from depression or depressive symptoms.[5] MAOIs and other serotonin-reuptake blockers are used to treat this condition. Our group of patients received isocarboxazid 10 mg/day in addition to anti-inflammatory drugs.

Our review revealed no elective surgery on patients receiving MAOIs after 1976. This was because anesthesia practice changed: reports of hemodynamic instability or hyperpyrexic coma in cases where meperidine was used led to the recommendation that elective surgery should be postponed for 2 weeks, during which time the MAOIs would be discontinued.

MAOIs and catechol 0-methyltransferases deaminate endogenous monoamines. The older MAOIs, including isocarboxazid, form an irreversible complex with monoamine oxidase leading to increased intraneuronal levels of amine neurotransmitters.[6] With newer MAOIs, the bond is reversible and the clinical half-life of the agents is much shorter. The ability of MAOIs to inhibit the degradation of these neurotransmitters (serotonin, norepinephrine, and dopamine) accounts for their antidepressant effect. The accumulation of norepinephrine at peripheral nerve endings may cause an exaggerated response to indirect-acting sympathomimetic amines. Direct-acting sympathomimetic amines may also have an exaggerated response, but to a lesser extent.

Based on their substrate preference, three types of MAOIs have been documented.[7] MAOI-A has a preference for 5-hydroxytryptamine, dopamine, epinephrine, and norepinephrine. MAOI-B has a preference for beta-phenylethylamine and tyramine. The third type of MAOI (eg, isocarboxazid) reacts with both A and B substrates; commonly used MAOIs of this type include phenelzine and tranylcypromine. Current indications for MAOIs include atypical depression, panic disorders, phobias, and refractory depression. In some patients, withdrawal may cause an acute exacerbation of a preexisting psychiatric illness.

MAOIs may cause hepatotoxicity or an exaggerated response to other drugs normally metabolized by the liver. The reported cases of possible meperidine-MAOI interactions leading to hypotension or hypertension, hyperpyrexia, convulsions, intracranial bleeding, and coma are thought to be due to an increase in the brain concentration of serotonin. The incidence of these side effects is unknown but is suspected to be low since there are only isolated case reports.

Recent publications[3,4,6] seem to indicate that, with the new anesthetics and synthetic narcotics, patients on MAOIs are easier to manage. In our review, no patient suffered any untoward effect as a result of an interaction between the MAOI and commonly used anesthetic agents and narcotics. We feel that patients on MAOIs should not be routinely canceled for elective surgery, and that patients on a low-dose MAOI (as in our review) can be safely anesthetized.

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