CASE REPORT

Perioperative management of a patient on monoamine-oxidase Inhibitors: Case presentation and literature review

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ABSTRACT

Antidepressants are a frequently prescribed class of medications. Monoamine oxidase inhibitors (MAOIs) are a less commonly prescribed subclass and are typically used in resistant major depressive disorder (MDD.). The usage of MAOIs perioperatively is notoriously regarded given the propensity to increase drug interactions and decrease sympathetic stability.

We present a 51-year-old male with severe resistant MDD managed now successfully on a MAOI who presented for an elective orthopedic surgery. The patient was maintained on his MAOI through the surgery and through our attentive perioperative plan the patient was able to successfully complete the surgery with no intraoperative concerns.

Key Words: *Antidepressants; general anesthesia; Guidelines; Pain; surgery*

INTRODUCTION

Antidepressants represent the third most frequently prescribed class of medications in the United States and treat various disorders. Antidepressants are indicated for treating major depressive disorders, generalized anxiety disorders, phobias, and even posttraumatic stress syndrome. First-line treatment options are most often selective serotonin reuptake inhibitors (SSRIs) [1].

However, a less commonly prescribed class of antidepressants is monoamine oxidase inhibitors (MAOIs). MAOIs are an older class of antidepressants typically reserved for refractory psychiatric illness that has failed multiple lines of treatment [2].

MAOIs provide a clinical challenge for anesthesiologists as they increase the risk of drug interactions and decrease sympathetic stability [3-4.] We present the following case to highlight the relevant perioperative and intraoperative clinical decisions and showcase that the surgical case can proceed by taking precautionary steps.

CASE DESCRIPTION

A 51-year-old male with a past medical history most significant for severe resistant major depressive disorder now controlled for years on MAOI presents for elective left shoulder arthroscopy and joint decompression under general anesthesia. The patient initially presented to another hospital for surgery, but due to inexperience with perioperative MAOI management, the patient was referred to a tertiary center.

Prior to the surgery, the decision was made to continue the patient on his stable dosage of phenelzine (Nardil) 15 mg through the operation. On the day of the surgery, perioperative vitals were normal with a blood pressure of 117/70, heart rate of 64, and 97% oxygen saturation.

The patient was brought to the operating room and induced with 2 mg versed, 150 mg propofol, 100 mg of lidocaine, and 50 mg of rocuronium. Post-induction arterial line was placed due to concerns for sympathetic and cardiac lability. Additionally, the patient was placed in a beach-chair position. Throughout the case, hemodynamic lability was noted with a nidus blood pressure reading of 75/35 and a peak of 162/95 with a heart range ranging from 45 to 134. While this was a relatively short and low-risk procedure, there were still notable hemodynamic shifts that, while quickly corrected, demonstrate the challenges of managing patients on these medications.

Hypotension was mitigated primarily with fluid resuscitation, and special attention was paid to avoiding any indirect-acting vasopressors. Pain control was managed with morphine and adjunctive therapies such as ketorolac and acetaminophen. The decision was made post-operatively to proceed with a brachial plexus block in addition to the intraoperative pain modalities for maximal pain control and least sympathetic activity. The patient had an uncomplicated post-op course, was successfully extubated, and was discharged home later that day.

DISCUSSION

Monoamine Oxidases (MAO) are enzymes involved in the breakdown of amine neurotransmitters. They are subsequently classified as MAO type A, which has a preference for norepinephrine and serotonin, whereas MAO type B deaminates tyramine and phenylethylamine. The antagonism of MAO type A is responsible for the antidepressant effect. [5] Anesthetic considerations and concerns are rooted in these alterations of neurotransmitter concentrations and the risk for aggravated adrenergic response to stimuli or pharmacologic interactions (**Table 1**).

Intentional overdose alone with MAOI leads to a clinical presentation of excessive sympathetic activity, severe hypertension, and hyperthermia. Further, the increased likelihood of drug-drug interactions and risk of serotonin toxicity or serotonin syndrome pose a logistical and clinical challenge for the anesthesiologist managing these patients intra-operatively and in the immediate postoperative period. Pain management can also be challenging due to opioids' intrinsic affinity for serotonin receptors and serotonin reuptake inhibition, leading to difficulty in proper pain control (**Table 2**).

Historically, there has been much debate regarding managing patients

TABLE 1

Medications at increased risk of interaction leading to hypertensive crisis

Decongestants	Stimulants	Norepinephrine reuptake inhibition	Other
Pseudoephedrine	Methylphenidate	SNRIs	Methampheta-mine, Cocaine
	Modafinil	NRIs	Phentermine
	Amphetamine	NDRIs	Tramadol, Tapentadol
	Armodafinil	Most Tricyclics	Local anesthetics with epinephrine

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TABLE 2

Pain medications and level of risk of administration with MAOIs

Administration with MAOIs low-risk	Administration with MAOIs to be used with caution	Administration with MAOI high-risk or should be avoided
NSAIDs	Morphine	Meperidine
Aspirin	Oxycodone	Methadone
Acetaminophen	Hydromorphone	Tramadol
Hydrocodone	Oxymorphone	Tapentadol
Nalbuphine	Fentanyl	
Buprenorphine		
Codeine		

on MAOI. As highlighted above, the risks associated with these medications are significant, but the abrupt withdrawal precipitating psychiatric relapse may be equally concerning. Older literature recommended stopping MAOI two weeks prior to the operation with a taper. We believe that patients on MAOI can be continued on their medications and are nonetheless suitable for ambulatory anesthesia if careful attention is paid to their peri-operative anesthesia management, as demonstrated in this case. Furthermore, the benefits of continuing the MAOI perioperatively decrease the risk of psychiatric decompensation as MAOI usage typically reflects the difficulty in managing psychiatric illness [6-7].

CONCLUSION

While it can be concerning for providers to manage patients maintained on MAOIs, we recommend that surgical operations not be delayed or rescheduled only due to the continuation of this medication. Conversations should be held between the surgical team, anesthesia team, and primary or psychiatric provider to assess the risk vs. benefit of continuing versus stopping the medication. It is essential to ensure that an anesthesia provider avoids excessive stimulation by maintaining a proper depth of anesthesia and adequate pain control. Due to the pharmacologic properties and interactions associated with MAOIs, caution should be used when administering vasopressors, and any indirect-acting medications should be avoided at all costs. Some opioids, including meperidine, methadone, and tramadol should be avoided due to affinity for post-synaptic serotonin receptors or serotonin/norepinephrine reuptake inhibition. Adjunctive therapies such as non-opioid pain medications and regional nerve blocks should be utilized to reduce pain and sympathetic responses to pain. As noted in our case: low-risk, less invasive, and shorter cases in patients with no significant medical history can successfully undergo surgical stress and general anesthesia without complications or increased hospital stay.

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