

Should residents be taught how to prescribe monoamine oxidase inhibitors?

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What else can I offer this patient? This thought passed through my mind as the patient's desperation grew palpable. He had experienced intractable major depressive disorder (MDD) for years and had exhausted multiple classes of antidepressants, trying various combinations without any relief.

The previous resident had arranged for intranasal ketamine treatment, but the patient was unable to receive it due to lack of transportation. As I combed through the list of the dozens of medications the patient previously had been prescribed, I noticed the absence of a certain class of agents: monoamine oxidase inhibitors (MAOIs).

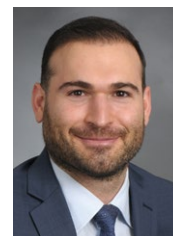
My knowledge of MAOIs stemmed from medical school, where the dietary restrictions, potential for hypertensive crisis, and capricious drug-drug interactions were heavily emphasized while their value was minimized. I did not have any practical experience with these medications, and even the attending physician disclosed he had not prescribed an MAOI in more than 30 years. Nonetheless, both the attending physician and patient agreed that the patient would try one.

Following a washout period, the patient began tranylcypromine. After taking tranylcypromine 40 mg/d for 3 months, he reported he felt like a weight had been lifted off his chest. He felt less irritable and depressed, more energetic, and more hopeful for the future. He also felt that his symptoms were improving for the first time in many years.

An older but still potentially helpful class of medications

MDD is one of the leading causes of disability in the United States, affecting millions of people. Its economic burden is estimated to be more than \$200 billion, with a large contingent consisting of direct medical cost and suicide-related costs.¹ MDD is often recurrent—60% of patients experience another episode within 5 years.² Most of these patients are classified as having treatment-resistant depression (TRD), which typically is defined as the failure to respond to 2 different medications given at adequate doses for a sufficient duration.³ The Sequenced Treatment Alternatives to Relieve Depression trial suggested that after each medication failure, depression becomes increasingly difficult to treat, with many patients developing TRD.⁴ For some patients with TRD, MAOIs may be a powerful and beneficial option.^{5,6} Studies have shown that MAOIs (at adequate doses) can be effective in approximately one-half of patients with TRD. Patients with anxious, endogenous, or atypical depression may also respond to MAOIs.⁷

MAOIs were among the earliest antidepressants on the market, starting in the late 1950s with isocarboxazid, phenelzine, tranylcypromine, and selegiline. The use of MAOIs as a treatment for depression was



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Clinical Point

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serendipitously discovered when iproniazid, a tuberculosis drug, was observed to have mood-elevating adverse effects that were explained by its monoamine oxidase (MAO) inhibitory properties.⁸ This sparked the hypothesis that a deficiency in serotonin, norepinephrine, and dopamine played a central role in depressive disorders. MAOs encompass a class of enzymes that metabolize catecholamines, which include the previously mentioned neurotransmitters and the trace amine tyramine. The MAO isoenzymes also inhabit many tissues, including the central and peripheral nervous system, liver, and intestines.

There are 2 subtypes of MAOs: MAO-A and MAO-B. MAO-A inhibits tyramine, serotonin, norepinephrine, and dopamine. MAO-B is mainly responsible for the degradation of dopamine, which makes MAO-B inhibitors (ie, rasagiline) useful in treating Parkinson disease.⁹

For most psychiatrists, MAOIs have fallen out of favor due to their discomfort with their potential adverse effects and drug-drug interactions, the dietary restrictions patients must face, and the perception that newer medications have fewer adverse effects.¹⁰ Prescribing an MAOI requires the clinician to remain vigilant of any new medication the patient is taking that may potentiate intrasynaptic serotonin, which may include certain antibiotics or analgesics, causing serotonin syndrome. Close monitoring of the patient's diet also is necessary so the patient avoids foods rich in tyramine that may trigger a hypertensive crisis. This is because excess tyramine can precipitate an increase in catecholamine release, causing a dangerous increase in blood pressure. However, many foods have safe levels of tyramine (<6 mg/serving), although the perception of tyramine levels in modern foods remains overestimated.⁵

Residents need to know how to use MAOIs

Psychiatrists should weigh the risks and benefits prior to prescribing any new

medication, and MAOIs should be no exception. A patient's enduring pain is often overshadowed by the potential for adverse effects, which occasionally is overemphasized. Other treatments for severe psychiatric illnesses (such as lithium and clozapine) are also declining due to these agents' requirement for cumbersome monitoring and potential for adverse effects despite evidence of their superior efficacy and antisuicidal properties.^{11,12}

Fortunately, there are many novel therapies available that can be effective for patients with TRD, including transcranial magnetic stimulation, ketamine, and vagal nerve stimulation. However, as psychiatrists, especially during training, our armamentarium should be equipped with all modalities of psychopharmacology. Training and teaching residents to prescribe MAOIs safely and effectively may add a glimmer of hope for an otherwise hopeless patient.

References

- Greenberg PE, Fournier AA, Sisitsky T, et al. The economic burden of adults with major depressive disorder in the United States (2010 and 2018). *Pharmacoeconomics*. 2021;39(6):653-665.
- Hardeveld F, Spijker J, De Graaf R, et al. Prevalence and predictors of recurrence of major depressive disorder in the adult population. *Acta Psychiatr Scand*. 2010;122(3):184-191.
- Gaynes BN, Lux L, Gartlehner G, et al. Defining treatment-resistant depression. *Depress Anxiety*. 2020;37(2):134-145.
- Trivedi MH, Rush AJ, Wisniewski SR, et al. Evaluation of outcomes with citalopram for depression using measurement-based care in STAR*D: implications for clinical practice. *Am J Psychiatry*. 2006;163(1):28-40.
- Fiedorowicz JG, Swartz KL. The role of monoamine oxidase inhibitors in current psychiatric practice. *J Psychiatr Pract*. 2004;10(4):239-248.
- Amsterdam JD, Shults J. MAOI efficacy and safety in advanced stage treatment-resistant depression—a retrospective study. *J Affect Disord*. 2005;89(1-3):183-188.
- Amsterdam JD, Hornig-Rohan M. Treatment algorithms in treatment-resistant depression. *Psychiatr Clin North Am*. 1996;19(2):371-386.
- Ramachandriah CT, Subramanyam N, Bar KJ, et al. Antidepressants: from MAOIs to SSRIs and more. *Indian J Psychiatry*. 2011;53(2):180-182.
- Tipton KF. 90 years of monoamine oxidase: some progress and some confusion. *J Neural Transm (Vienna)*. 2018;125(11):1519-1551.
- Gillman PK, Feinberg SS, Fochtmann LJ. Revitalizing monoamine oxidase inhibitors: a call for action. *CNS Spectr*. 2020;25(4):452-454.
- Kelly DL, Wehring HJ, Vyas G. Current status of clozapine in the United States. *Shanghai Arch Psychiatry*. 2012;24(2):110-113.
- Tibrewal P, Ng T, Bastiampillai T, et al. Why is lithium use declining? *Asian J Psychiatr*. 2019;43:219-220.



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