Varenicline for cessation from nicotine-containing electronic cigarettes

Approximately 10.8 million individuals in the United States used electronic cigarettes (e-cigarettes) in 2016.[1] Also known as e-hookahs and vapes, e-cigarettes generally have a battery, heating element, and liquid reservoir.[2] They usually contain the addictive drug nicotine and may have other harmful substances, including carcinogens and heavy metals. Many adults use e-cigarettes for cigarette smoking cessation, but e-cigarettes are not Food and Drug Administration (FDA) approved, and insufficient evidence exists to recommend their use for this indication.

There are 7 available FDA-approved medications for cigarette smoking cessation; these include 5 nicotine replacement therapies (NRTs), bupropion, and varenicline. Varenicline is a partial neuronal α-4 β-2 nicotinic receptor agonist whose use results in decreased craving and withdrawal symptoms. It is initiated 1 week before a patient's cigarette quit date. It is generally taken orally at 0.5 mg daily for 3 days, with the dosage increased to 0.5 mg twice daily for 4 days and then to 1 mg twice daily thereafter. The typical duration of treatment is 12 weeks, but some patients may be candidates for 24 weeks of treatment. Potential adverse effects include nausea, headache, and vivid dreams. Precautionary prescribing warnings include suicidal ideation and depressed mood. In 2011, FDA issued a safety alert regarding the potential risk of cardiovascular events in patients with preexisting cardiovascular disease.[3]

Although varenicline is among the medications approved for cigarette smoking cessation, there is no established regimen for e-cigarette vaping cessation. This raises the question of what can be used for the successful management of patients who seek to quit e-cigarettes. We report a case of e-cigarette cessation using varenicline in a patient seen in a pharmacist-managed smoking cessation clinic.

The patient was a 53-year-old Caucasian man and 9/11 responder with a history of rhinitis, sinusitis, gastroesophageal reflux disease, lung nodules, and osteoarthritis. He denied any history of mental health treatment, head injuries, seizures, or atypical chest pain. He reported a 15-year history of tobacco use, smoking 1 to 1.5 packs of cigarettes per day, and a past cessation trial and failure with an NRT combination of patch and gum. The patient had switched to e-cigarettes (Logic, Princeton, NJ), vaping 2 cartridges (containing 27 mg/mL of nicotine) per day for the last 4 years.[4] He reported a strong desire to quit e-cigarettes but denied any past pharmacotherapy trials, with the exception of NRT for his cigarette use.

The patient and clinical pharmacist agreed on varenicline therapy. The pharmacist counseled the patient about adverse effects and proper medication administration. The plan was to use varenicline for 12 weeks. Significant barriers to the patient's vaping cessation attempt included the severity of nicotine addiction and his vaping triggers. The pharmacist provided behavioral techniques to aid in vaping cessation. The patient was seen 1 month after varenicline initiation. He reported medication adherence and denied any vaping or adverse effects except for 1 vivid dream. The patient reported that varenicline was dispensed as 0.5 mg twice daily and that the instructions for use did not include the adjustment to 1 mg twice daily. The pharmacist provided counseling about the dosage elevation regimen, and the patient professed understanding.

During his 2-month follow-up visit, he denied any vaping but reported weight gain secondary to substituting food for vaping. The pharmacist reinforced the importance of behavioral interventions to cope with triggers and choosing healthy snacks and referred the patient to a registered dietitian. The patient reported an improvement in his breathing since e-cigarette cessation. He denied adverse effects but stated that he occasionally missed the second daily dose of varenicline. The pharmacist discussed the importance of and offered techniques to improve medication adherence.

The Letters column is a forum for rapid exchange of ideas among readers of AJHP. *Liberal criteria are applied in the review of submissions to encourage contributions to this column.*

The Letters column includes the following types of contributions: (1) comments, addenda, and minor updates on previously published work, (2) alerts on potential problems in practice, (3) observations or comments on trends in drug use, (4) opinions on apparent trends or controversies in drug therapy or clinical research, (5) opinions on public health issues of interest to pharmacists in health systems, (6) comments on ASHP activities, and (7) human interest items about life as a pharmacist. Reports of adverse drug reactions must present a reasonably clear description of causality.

Short papers on practice innovations and other original work are included in the Notes section rather than in Letters. Letters commenting on an AJHP *article must be received within 3 months of the article's publication.*

Letters should be submitted electronically through http://ajhp.msubmit.net. The following conditions must be adhered to: (1) the body of the letter must be no longer than 2 typewritten pages, (2) the use of references and tables should be minimized, and (3) the entire letter (including references, tables, and authors' names) must be typed double-spaced. After acceptance of a letter, the authors are required to sign an exclusive publication statement and a copyright transferal form. All letters are subject to revision by the editors.

Continued on page 1896

Continued from page 1894

At the 3-month follow-up visit, the patient denied vaping and reported a decrease in vaping urges and triggers. He also stated that he lost 5 pounds after seeing a dietitian. He denied adverse effects but again reported forgetting occasionally to take the second daily dose of varenicline. The pharmacist reinforced the importance of adherence and the patient's success in cessation and discussed what was planned after completion of varenicline therapy. The patient remained motivated to continue the cessation plan.

The pharmacist conducted a telephone follow-up with the patient 1 month later. He reported completion of the varenicline regimen and e-cigarette abstinence and agreed to a follow-up in 6 months.

This experience suggests that varenicline may be beneficial for nicotine-containing e-cigarette cessation. Our patient demonstrated successful cessation with a 12-week course of varenicline and behavioral counseling. Aside from 1 vivid dream, varenicline also proved to be safe. Research may determine varenicline's role in e-cigarette cessation and indicate whether other smoking cessation medications may be effective for people who wish to quit e-cigarettes.

1. Mirbolouk M, Charkhchi P, Kianoush S et al. Prevalence and distribution of e-cigarette use among U.S. adults: behavioral risk factor surveillance system, 2016. *Ann Intern Med.* 2018; 169:429-38.
2. Centers for Disease Control and Prevention. Basic information. About electronic cigarettes (e-cigarettes), 2018. https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html (accessed 2018 Oct 25).
3. Lexicomp. Lexi-Drugs [online database]. Varenicline, 2018. https://online.lexi.com (accessed 2019 Feb 6).
4. Logic. E-liquid & flavors. What is the nicotine concentration of Logic e-liquids? https://logicvapes.us/what-is-the-nicotine-concentration-of-logic-e-liquids (accessed 2018 Oct 31).

Shaziya S. Barkat, Pharm.D.
Memorial Sloan Kettering Cancer Center
New York, NY
barkatshaziya@gmail.com

Shannon M. Tellier, Pharm.D., BCACP
Stony Brook World Trade Center Health Program
Commack, NY
Department of Medicine
Stony Brook University Hospital
Stony Brook, NY

Amanda S. Eloma, Pharm.D., BCPP
New York City Health and Hospitals
Kings County Hospital Center
Brooklyn, NY

Disclosures: The authors have declared no potential conflicts of interest.

Keywords: electronic cigarette, nicotine dependence, smoking cessation, tobacco use disorder, vaping

DOI 10.1093/ajhp/zxz218

Area under the curve–based vancomycin monitoring

We read with interest the study by Kufel et al.,[1] who conducted a survey of perceptions and status of the implementation of vancomycin monitoring based on area under the concentration–time curve (AUC). More than 88% of academic medical centers within the Vizient University HealthSystem Consortium Pharmacy Network did not have definitive plans to transition to AUC-based monitoring, with the most common barriers being unfamiliarity, time required, and training.

Our team successfully implemented a switch from trough- to AUC-based vancomycin dosing using 2-sample measurements in less than 5 months.[2] We used implementation strategies presented at various forums, including the American Society of Health-System Pharmacists Midyear Clinical Meeting[3] and the 2018 Making a Difference in Infectious Diseases meeting.[4] More recently, a series of webinars on this topic has been offered through the Society of Infectious Diseases Pharmacists Education Center,[5,6] concurrent with the release of draft vancomycin consensus guidelines in March 2019.[7] We employed several live 45-minute pharmacist in-service sessions led jointly by medicine clinical pharmacists and the antimicrobial stewardship/infectious diseases pharmacist. We found a 2-week pilot particularly useful in identifying and improving workflow and protocol specifics. Real-time audits and consultations for the initial month after hospital-wide implementation was also important in training frontline pharmacists. Although upfront implementation was intensive, we felt that this was crucial in the transition. Other strategies and experiences that may be of interest have been recently described.[8,9]

Continued on page 1898