

Case Study

Three Decades of High-Dose Nicotine Gum Dependence Treated With Nicotine Patches

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Abstract

Introduction: Some long-term nicotine gum users are addicted to nicotine and may need assistance to stop. There is no published evidence on the use of nicotine patches for this purpose.

Case Description: A 45-year old man presented with a 30-year history of high-dose nicotine gum use (up to 200 mg nicotine per day). He was highly nicotine dependent and had failed repeatedly to stop using nicotine gum use in the past. Within a week of commencing nicotine patches he was able to cease nicotine gum with minimal discomfort and has remained nicotine-free for 6 months, with abstinence confirmed biochemically. His severe sweating disorder rapidly resolved with cessation of the gum.

Conclusion: Nicotine patches may be an effective treatment for long-term nicotine gum addiction.

Introduction

Six to nine percent of nicotine gum users report persistent use of 6–12 months or more.^{1,2} Long-term nicotine gum can help prevent relapse to smoking and may have a role in harm reduction.³ However, although nicotine replacement therapy is much less harmful than tobacco smoke, long-term nicotine gum has a financial cost, perpetuates an addiction and may have some health risk.³ Complete abstinence from nicotine is always preferred if possible.

Most long-term nicotine gum users are able to stop by gradual tapering or abrupt cessation.⁴ However some are addicted to nicotine gum and may need assistance to quit. Varenicline is an effective treatment for long-term nicotine replacement therapy use⁵ but there is little research in other pharmacotherapies to help guide management.

A case study is presented of a long-term, highly dependent nicotine gum user treated with nicotine patches.

Case Description

Mr K, a 45-year old Caucasian man, was admitted to a private psychiatric hospital for alcohol detoxification. He reported a 30-year history of high-dose nicotine gum use (up to 200 mg nicotine daily).

On admission, Mr K was using 100 mg of nicotine daily (50 pieces of 2-mg nicotine gum), chewing two pieces at a time

vigorously and continuously. Mr K had commenced using nicotine gum regularly at the age of 14. He continued to smoke 25 cigarettes per day while using the gum until quitting smoking at the age of 21. For the next 23 years, he chewed 50 pieces of 4-mg nicotine gum daily (200 mg of nicotine). One year prior to hospital admission, he changed to 2-mg gum and experienced some withdrawal symptoms at that time.

Over the years, Mr K had experienced serious dental damage, ongoing jaw pain, substantial financial costs, and social embarrassment from constant chewing.

He had tried nicotine patches previously to treat his nicotine gum addiction but was unable to maintain skin adhesion due to heavy sweating. His excessive sweating also caused severe social embarrassment and limited his activity.

His use of nicotine gum met the *DSM-5* criteria for nicotine dependence. He had strong urges to use the gum (rated 10/10) and numerous failed attempts to quit due to strong cravings and withdrawal symptoms. He slept with nicotine gum in his mouth and had his first piece of the day immediately on waking.

On admission, expired carbon monoxide was 3 ppm, weight 102 kg, height 175 cm, and body mass index 33 (obese).

His medical history included attention deficit hyperactivity disorder, depression, and poly-substance use. His current medication was dexamphetamine 30–40 mg daily, fluvoxamine 300 mg daily and testosterone for body building.

Varenicline was not suitable in this acute inpatient setting because of its delayed effect so Mr K was commenced on twice-daily 21 mg/24 h nicotine patches. One patch was applied on rising and one at lunchtime and each patch was replaced after 24 hours. Each patch was covered with a 10×10 cm piece of adhesive fabric tape (Fixomull) to maintain skin adhesion. A reducing schedule of nicotine gum was established, to finish his remaining supply of 24 pieces over 5 days.

After 4 days, he had completely ceased using nicotine gum, replacing it with regular sugar-free chewing gum. He did not experience nicotine cravings or withdrawals. Soon after ceasing the nicotine gum, he reported that his excessive sweating had stopped completely. He was initially anxious when regular chewing gum was not readily available but this had settled by the end of the first week and he stopped using chewing gum altogether after 2 weeks.

Three months after patch initiation, a flexible, reducing schedule was introduced using full patches and half-patches. Mr K reduced the dose of transdermal nicotine at his own pace and completely ceased it after 6 weeks. He reported no urges or nicotine withdrawal symptoms during this time except for some brief anxiety when the last half-patch dose was ceased.

Six months after treatment was commenced, he reported being nicotine-free, and abstinence was verified by a negative urinary cotinine test. He no longer had jaw pain or excessive sweating and was delighted that nicotine gum was a vice he “was no longer beholden to.”

Discussion

This is the first published case to the author’s knowledge of transdermal nicotine used to treat addiction to nicotine gum. Cessation of gum was remarkably comfortable in spite of a very high level of daily nicotine intake.

The rationale for nicotine patches to treat nicotine gum dependence is based on the different pharmacokinetic properties of the two products. Nicotine from the patch is delivered more slowly than from the gum and is less rewarding.⁶ As a result, nicotine patches are easier to stop and long-term dependence is much less likely.¹

The optimal duration of nicotine patch treatment for nicotine gum addiction is not known. Smoking cessation generally involves a course of 8–12 weeks of nicotine replacement therapy to allow the smoker time to break the “habit” or ritual of smoking.⁷ In the case of long-term gum use there is habitual chewing behavior but no smoking ritual, so a shorter course of treatment may be adequate.

Another interesting aspect of this case is the severe sweating which rapidly resolved after ceasing the nicotine gum. Sweating is a recognized adverse effect of nicotine poisoning and was possibly

caused by the very high daily dose of nicotine in this case.³ The use of adhesive tape was vital to maintain adhesion of patches to the skin.

Conclusion

Nicotine patches may be an effective treatment for long-term nicotine gum addiction.

Further guidance on the duration and dose of nicotine patch use and the need for weaning would be useful information to assist clinicians.

Funding

None declared.

Declaration of Interests

CPM has received payments for consultancy, educational presentations, travel and related expenses from Pfizer Australia, GlaxoSmithKline and Johnson & Johnson Pacific.

Acknowledgments

The manuscript is the author’s own work and is not under review, in press, or published elsewhere. The manuscript meets ethical guidelines, including adherence to the legal requirements of Australia.

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