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Case Report

Marijuana Lollipop-Induced Myocardial Infarction

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See editorial by Benowitz, pages 138–141 of this issue.

ABSTRACT

A 70-year-old man with known coronary artery disease presented with crushing chest pain, diaphoresis, and pallor after consuming a marijuana lollipop; the pain began within 30 minutes of consumption. His troponin T increased from 94 ng/L to 216 ng/L, with slight ST changes but no gross ST elevations. Discharge diagnosis was non–ST-elevation myocardial infarction, and subsequent nuclear medicine wall motion studies showed worsening ejection fraction (40% to 31%). He also described worsening functional status and exercise capacity after the event. The outcome of this case is important with new marijuana legalization—hopefully with marijuana use no longer criminalized, more research into the cardiovascular side effects will emerge.

RÉSUMÉ

Un homme de 70 ans atteint de coronaropathie a consulté pour une douleur thoracique constrictive, une diaphorèse et une pâleur après avoir consommé une sucette au cannabis; la douleur s'était déclarée dans les 30 minutes suivant cette consommation. Une élévation du taux de troponine T, passé de 94 ng/l à 216 ng/l et une légère variation, mais pas d'élévation marquée, du segment ST ont été observées. Le diagnostic posé lors du congé de l'hôpital était un infarctus du myocarde sans élévation du segment ST, et des examens de médecine nucléaire de la mobilité de la paroi réalisés subséquemment ont mis en évidence une diminution de la fraction d'éjection (de 40 à 31 %). Le patient a également fait état d'une détérioration de ses capacités fonctionnelles et physiques après l'événement. L'issue de ce cas est importante dans le contexte de la légalisation récente de l'usage du cannabis. Il faut espérer que la décriminalisation de l'usage de cette substance favorisera l'émergence de nouvelles recherches sur ses effets secondaires cardiovasculaires.

We present the case of a 70-year-old man with a history of coronary artery disease (CAD) in whom the use of a large dose of oral marijuana appears to have triggered a cardiac event. Statistics Canada has reported an increasing use of marijuana, particularly within older age groups.[1] More research is needed on how each formulation of marijuana might affect the cardiovascular system of our aging population.

Case

A 70-year-old man with a known history of CAD presented with crushing chest pain after consuming most of a marijuana lollipop. The whole lollipop contained 90 mg of tetrahydrocannabinol (THC), so an estimated 70 mg was consumed. His CAD had been stable with no angina for more than 2 years. He previously had 4 coronary artery bypass graft surgeries in 2015. Other history included hypertension, dyslipidemia, diabetes mellitus type 2, obesity, greater than 30 pack-year smoking history, and family history of cardiac disease. Home medications included aspirin 81 mg daily, perindopril 8 mg daily, rosuvastatin 20 mg daily, metoprolol 100 mg twice daily, metformin 500 mg twice daily, glyburide 5 mg three times daily, pantoprazole 40 mg daily, and zopiclone 7.5 mg nightly. He also had painful osteoarthritis, and on the recommendation of a friend opted to try alternative pain treatments to improve his sleep.

One evening, the patient consumed > 75% of a 90-mg marijuana lollipop. It was his first experience with this oral formulation, though he reported previous use of smoked marijuana as a young man. Within 30 minutes the patient described fearful hallucinations, during which he called a family member because he "felt like [he] was dying." He had crushing chest pain and appeared diaphoretic, tremulous, and pale. At this point, they brought him to the nearest Emergency Department.

The Emergency Department staff found slight T wave changes on electrocardiogram and a significant troponin T elevation. Initial troponin T was 94 ng/L (upper limit of normal, < 14 ng/L) and peaked at 216 ng/L. Physical exam

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See page 229.e3 for disclosure information.

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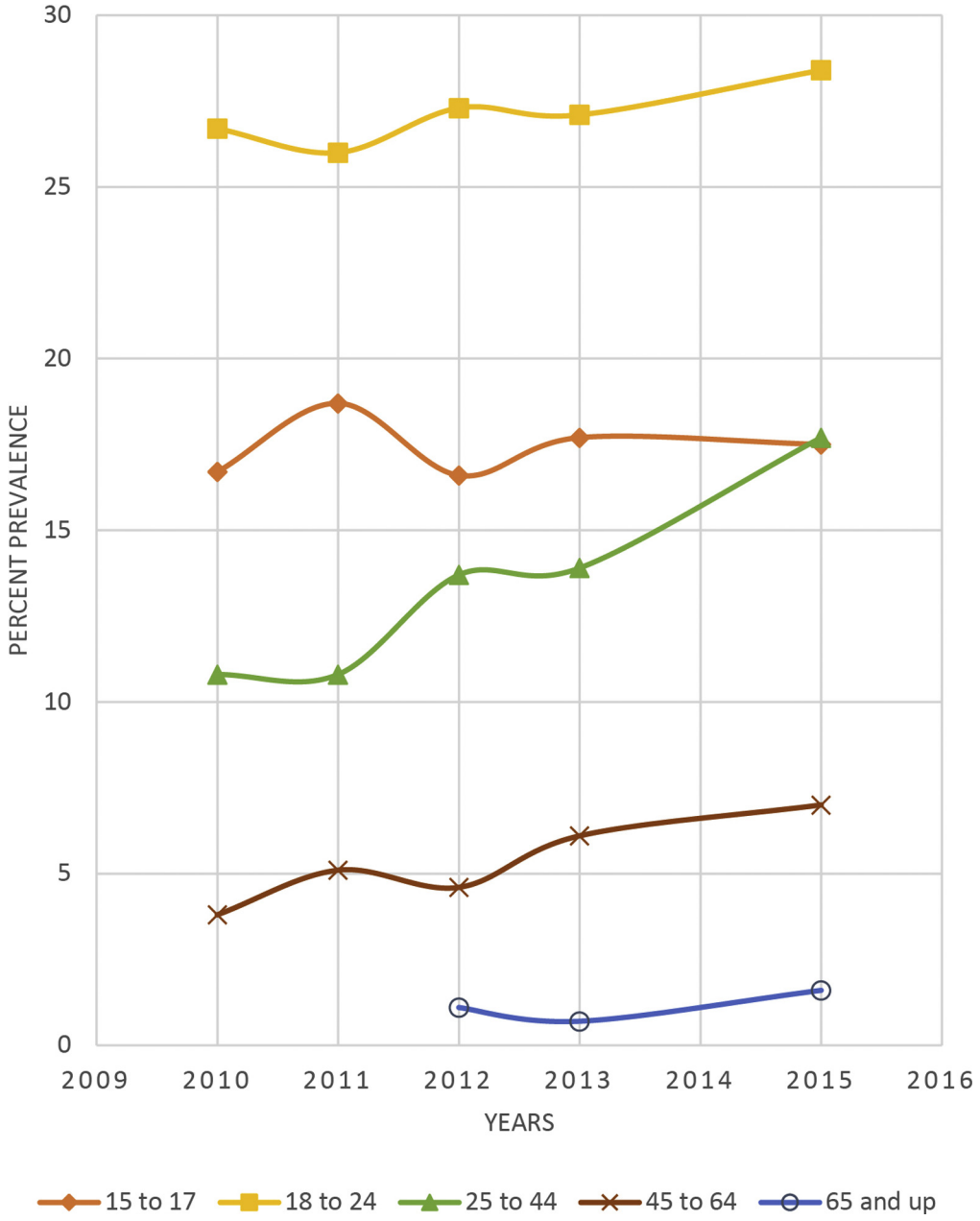

Figure 1. Statistics Canada-reported marijuana usage according to age group from 2010 to 2015. Data from McKiernan and Fleming.[5] Reproduced with permission of Statistics Canada.

revealed a heart rate of 126, respiratory rate of 25, blood pressure 160/70 mm Hg, and oxygen saturation of 94%. Cardiac exam was unremarkable, with no new murmurs and a clear chest. He was treated for non–ST-elevation myocardial infarction (MI) with a low molecular weight heparin bolus, acetylsalicylic acid, and clopidogrel. When his stressful hallucinations settled, his chest pain resolved and did not recur. After close monitoring and Cardiology assessment, he was eventually discharged home.

For follow-up, the patient had a nuclear medicine wall motion study performed 12 days later, which showed worsening of his ejection fraction compared with previous imaging in 2015 (from 40% to 31%). He described reduced functional status and exertional tolerance after the event. The patient had not retried marijuana lollipops in the meantime and was suggested to abstain from consuming similar quantities in the future.

Discussion

Ischemic heart disease remains the leading cause of death worldwide, ranking first in high-income countries and second only to cerebrovascular disease in developing countries. Recently there has been exploration into alternate lifestyle risk factors, including marijuana usage. The recent legalization of marijuana in Canada makes this topic especially pertinent.

In our patient's case, likely the cardiovascular event came during sudden and unexpected strain on the body with hallucinations. The sympathetic nervous system was stimulated, causing increased cardiac output with tachycardia, hypertension, and catecholamine release. Similarly, this has been described with cocaine use, although on a much larger scale. Mittleman et al.[2] described a fivefold increase in the risk of MI after smoking of marijuana, whereas cocaine was reported to have a 24-fold increase in risk of MI.

The psychoactive component primarily responsible for the cardiovascular effects is THC, which activates the G protein-coupled cannabinoid receptor 1 and is hypothesized to be responsible for cardiovascular side effects.[3] Additionally, the THC content in marijuana has risen from 3% to 12% in the past decade and might be responsible for the development of more marijuana-associated MIs.[4] The THC content of the marijuana lollipop was 90 mg, compared with 7 mg, which is the average amount of THC in a single joint.[4]

Physicians are now practicing with new marijuana legislation and will have to prepare for subsequent edible cannabis use. Marijuana has an avenue for relief of pain and symptoms of nausea, particularly in the setting of oncology, and can be a useful tool for many patients. However, like all other medications, it does carry risk and side effects.

In our patient with a history of CAD, the use of a large dose of oral marijuana appears to have triggered a cardiac event. The general public attitude toward marijuana has shifted, with one recent report showing that youth report it as "the safest" of all substances and that the health benefits outweigh the risks.[4] Statistics Canada reports increasing use of marijuana, particularly within older age groups (Fig. 1).[1] Previous case reports of marijuana-induced MI are described mostly in younger patients,[4] but more research is needed on how each formulation of marijuana might affect the cardiovascular system of our aging population; this way, physicians can appropriately counsel patients on proper use.

Disclosures

The authors have no conflicts of interest to disclose.

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