Letters

Pediatric cannabis use and cardiac complications

We read with interest the study by Ladha and colleagues, describing young adults (aged 18–44 yr) with myocardial infarctions (MI) and recent cannabis use; smoking was the primary route of consumption.[1] Unfortunately, the findings described in this paper are not limited to adults. We recently reported on a 16-year-old adolescent who presented to our pediatric institution for chest pain after smoking cannabis, with an electrocardiogram revealing diffuse ST-segment elevations and echocardiogram showing global left ventricular dysfunction.[2] Comprehensive toxicology testing showed only a Δ-9-tetrahydrocannabinol (THC) metabolite and was negative for cocaine and several other synthetic cannabinoids; an extensive infectious workup was unremarkable, making myocarditis unlikely. No focal coronary lesions or obstruction were detected with coronary angiography and a right ventricular septal endomyocardial biopsy obtained 36 hours after chest pain onset showing a subendocardial acute MI.

Cardiac complications of pediatric cannabis exposure described in the literature include both tachycardia and bradycardia, or bradycardia and hypotension, with the latter occurring typically in the setting of respiratory depression.[3,4] Further, an 11-month-old died after cannabis exposure, with myocarditis diagnosed at autopsy.[5] As cannabis use becomes more liberalized, pediatric exposures have increased.[6] In 2020, the American Heart Association released a scientific statement summarizing the cardiovascular implications of cannabis: cardiomyopathy, MI, arrhythmias or sudden death, and cerebral vascular accidents are described.[7] While THC stimulates the sympathetic nervous system with subsequent increased heart rate, myocardial oxygen demand, supine blood pressure and platelet activation in general, smoking THC can additionally increase carboxyhemoglobin concentrations 5-fold with endothelial dysfunction; moreover, increased lipoprotein oxidation and impaired oxygen binding have also been associated with negative cardiac outcomes.[7] Education from a public health perspective targeted to the pediatric population is important to minimize these potential marijuana-related cardiac complications, both in terms of unintentional exposures and adolescent inhalational use.[3]

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