Cardiac Arrhythmias Among Teenagers Using Cannabis in the United States

Marijuana has currently reached its highest level of use in over 30 years and remains a very popular drug in teenagers[1] despite its deleterious cardiac effects.[2] We conducted a retrospective study to investigate the prevalence of cardiac arrhythmias in teenage cannabis users using the 2016 Kids' Inpatient Database (KID) provided by Healthcare Cost, and Utilization Project, Agency for Healthcare Research Quality, and their partners. It involves admission data from over 4,000 US hospitals.

All data were converted to weighted forms and restricted to ages from 13 to 19 inclusive for teenage patients.[3] The International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes for cannabis use, dependence and abuse were also used.[4] Cases of ventricular fibrillation, palpitation, atrial flutter, atrial fibrillation, pre-excitation syndrome, and long QT syndrome were also identified using their respective ICD-10 codes.

A total of 68,793 (7.3%) weighted cases of cannabis use, dependence and abuse were recorded in teenagers (Table 1). Twenty-six patients had ventricular fibrillation (37.8 per 100,000 cases of cannabis users), 96 reported palpitations (139.5 per 100,000 cases of cannabis users) whereas 57 had pre-excitation syndrome (82.3 per 100,000 cases of cannabis users). We also found that long QT syndrome was most common with 353 patients (513.1 per 100,000 cases of cannabis users). Eighty teenagers (116.3 per 100,000 cases of cannabis users) had atrial fibrillation and 25 (36.3 per 100,000 cases of cannabis users) had atrial flutter. The mortality rate of teenagers with cannabis use, abuse or dependence was 106.3 per 100,000 cases of cannabis users (73 cases).

Table 1
Cardiac arrhythmias in teenagers using cannabis

	Number of cases (per 100,000 teenage cannabis users)
Ventricular fibrillation	26 (37.8)
Palpitation	96 (139.5)
Atrial flutter	25 (36.3)
Atrial fibrillation	80 (116.3)
Pre-excitation syndrome	57 (82.9)
Long QT	353 (513.1)

There are multiple hypothesized pathways that can lead to cardiac arrhythmias in cannabis users. Adrenergic stimulation and atrial ischemia from cannabis use can lead to atrial arrhythmias[5] whereas catecholamine surges have been linked with ventricular fibrillation.[6] Long QT syndrome can be seen in cannabis users due to blocking of the hERG channels.[7]

This study provides a new perspective on the prevalence of cardiac arrhythmias in teenagers using cannabis. The limitations of the KID include coding errors, data entry errors, and the restricted use in assessing long-term follow-ups.

Disclosures

The authors have no conflict of interest to declare.

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