Unmasking a killer: Brugada ECG pattern in cannabis users – A warning sign for sudden cardiac death

Dear Editor,

A 21-year-old unmarried male, studying degree 3rd year, from an upper middle socioeconomic background, was brought by his parents with history of polysubstance use. Upon a brief history taking, it was revealed that he used to go out with his friends and started experimenting with various substances out of curiosity for 5 years such as alcohol, inhalants, nitrazepam tablets, meth crystals but stopped using them after 2 to 3 months due to fear of health risks. But he continued using cigarettes and cannabis (in the form of bong, chillum, and joints) for 5 years. He smokes about 7 to 8 cigarettes, as well as about 20 joints of cannabis per day, the last intake being the previous day of admission.

He had only experienced short periods of abstinence in the past due to religious reasons, promptly returning to substance use thereafter. Notably, the patient had a medical history of syncopal episodes for 6 years, 5 episodes until now, the last episode being 8 months back, which was not investigated medically but did not exhibit a temporal correlation with cannabis intoxication. As per the patient, these episodes occurred when he was tired or dehydrated. There is no significant familial background of substance use, cardiac disease, or sudden cardiac deaths. His premorbid personality was indicative of impulsive traits.

Following admission to the de-addiction ward, the patient's vital signs were recorded and routine diagnostic tests were conducted. His BP was 118/80 mmHg, and he was afebrile. An irregular and low pulse rate was observed, while all his other vitals and blood test results such as complete blood picture, liver function tests, renal function tests, viral screening, and ultrasound abdomen, were within normal limits. His electrocardiogram (ECG) displayed ST segment and T wave alterations in leads V1 and V2 as shown in Figure 1b when compared to a normal ECG as shown in [Figure 1a].

Cardiology referral was done and he was kept on Holter monitoring. His Holter report showed type 3 Brugada ECG pattern with saddle-back pattern of ST segment and T wave as shown in Figure 1c with sinus pauses occasionally.

2D echocardiogram showed a preserved left ventricular ejection fraction (LVEF) of 60% without structural and functional abnormality. He was managed conservatively by Tab. Orciprenaline 10 mg thrice daily, which is a β2 adrenergic agonist. The cardiologist planned on permanent pacemaker implantation if syncopal episodes continue. The patient was maintaining well on the conservative treatment and was discharged.

DISCUSSION

Brugada syndrome is an autosomal dominant disorder that affects the heart rhythm leading to sudden cardiac deaths. There is evidence to suggest a potential association between cannabis use and the manifestation of Brugada syndrome. Several case reports and studies have documented cannabis consumption has been linked to the unmasking or induction of Brugada pattern on ECGs.[1-3] For instance, a case reported by Seri *et al*.[1] revealed that vaping tetrahydrocannabinol unmasked Brugada pattern and induced ventricular fibrillation in a patient with Brugada syndrome. These findings are significant as they suggest a potential link between cannabis use and the development or unmasking of Brugada syndrome. There are some case reports, which link cannabis use to syncopal episodes.[4,5]

Risk factors for serious arrhythmic event in Brugada's syndrome include.[6]

a. History of cardiogenic syncope, presence of a spontaneous type 1 ECG
b. Drugs like antiarrhythmics (like flecainide,

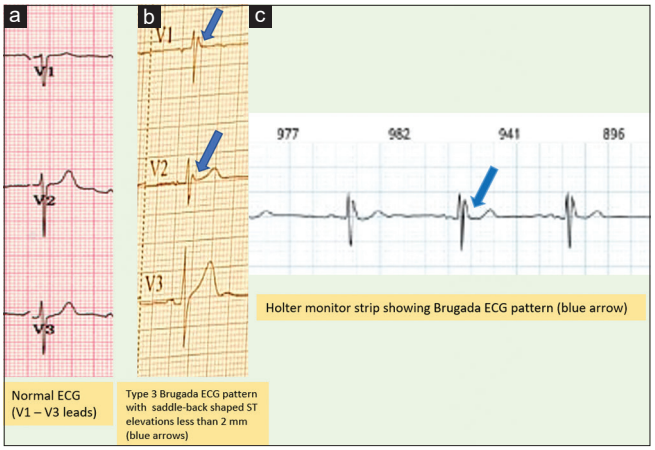

Figure 1: (a) shows V1,V2,V3 leads in a normal ECG for reference, (b) shows V1,V2,V3 leads with saddle-back pattern in the patient's ECG (blue arrows), (c) shows Holter monitor strip of the patient confirming Brugada's type 3 pattern (blue arrows)

procainamide), psychotropics (like TCAs, Lithium, Fluoxetine), anaesthetic agents (like propofol)
c. Febrile illness
d. Non-prescription drugs like antihistamines
e. Illicit substances like cocaine, cannabis, alcohol.

It is important to consider these associations in clinical practice, especially when evaluating patients with a history of cannabis use and unexplained cardiac symptoms. Further research is warranted to elucidate the underlying mechanisms and the extent of the relationship between cannabis and Brugada syndrome. There is a scarcity of such reports in India despite frequent use of cannabis use.

CONCLUSION

1. Cannabis is linked to ECG abnormalities, especially Brugada Syndrome.
2. As cannabis is frequently abused in India, unexplained cardiac events should be thoroughly investigated for underlying Brugada Syndrome.
3. Cardiac evaluation should be a priority in cannabis users, as Brugada syndrome may cause sudden cardiac deaths in susceptible individuals.

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Conflicts of interest
There are no conflicts of interest.

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