Late onset epilepsy with marijuana abuse: clinico-radiological correlation (case report)
Epilepsie tardive avec abus de marijuana: corrélation clinico-radiologique (à propos d'un cas)

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No disclosure to be declared.

Abstract

Background: Marijuana is the most widely used illicit substance in the world. The relation between marijuana use and epileptic seizures is still controversial. Authors report a case of late onset epilepsy with marijuana abuse and brain magnetic resonance imaging (MRI) findings.

Observation: A 44-year-old patient was admitted for 03 isolated episodes of secondary generalized tonic-clonic seizures. He had a history of 26 years regular marijuana smoking. On admission, we found a tachycardia, psychomotor slowing, asymmetric hyperreflexia, bilateral Babinski sign without weakness. Laboratory work-up showed a high level of urine of-9-tétrahydroxycannabinol. Electroencephalogram was normal. Brain MRI revealed abnormal signal intensities in the right frontal lobe and basal ganglia. Seizures cessation was obtained with anti-epileptic treatment.

Conclusion: The relationship between marijuana abuse and epilepsy remains unclear. Marijuana abuse could lead indirectly to epilepsy through epileptogenic focal brain lesion(s) or play as a trigger factor for pre-existing epileptic seizures.

Keywords: Epilepsy- Intracerebral haemorrhage- Marijuana- MRI.

Résumé

Introduction : La marijuana est la drogue la plus consommée dans le monde. La relation entre la consommation de cette substance et l'épilepsie reste controversée. Les auteurs rapportent un cas d'épilepsie tardive avec abus de marijuana.

Observation : Le patient âgé de 44 ans était admis pour trois épisodes isolés de crise focale tonico-clonique secondairement généralisée avec une notion de consommation régulière de marijuana depuis 26 ans. A l'admission, l'examen retrouvait une tachycardie, un ralentissement psychomoteur, une hyperréflexie bilatérale asymétrique, un signe de Babinski bilatéral, mais sans déficit moteur. Les examens biologiques avaient montré un taux élevé de Δ9-tétrahydroxycannabinol urinaire. L'électroencéphalogramme était normal et l'IRM cérébrale montrait des anomalies de signal dans le lobe frontal droit et les ganglions de la base. L'arrêt des crises était obtenu sous traitement antiépileptique.

Conclusion : L'abus de marijuana pourrait favoriser les crises épileptiques soit indirectement en provocant des lésions cérébrales focales épileptogènes, soit en agissant comme facteur déclenchant de crises épileptiques préexistantes.

Mots-clés: Epilepsie- Hémorragie cérébrale- Marijuana- IRM.

Introduction

Marijuana is a naturally growing plant, with many chemical constituents. Approximately 60 cannabinoids and 260 non cannabinoid constituents have been identified [1]. Marijuana is the most widely used illicit substance in the world [2]. It is generally smoked, but may also be ingested. Acute administration produces diverse cognitive, perceptual, and cardiovascular effects [3]. The association between marijuana and epileptic seizures is still controversial. Interestingly, some evidence suggests that marijuana and its active cannabinoids have antiepileptic effects, especially for focal or tonic-clonic seizures [4, 5]. Authors describe a case of late-onset epilepsy in a patient with marijuana abuse, with magnetic resonance imaging (MRI) findings.

Observation

The patient was a 44-year-old man, single and jobless who was admitted in the neurology department for three isolated episodes in five hours, of secondary generalized left body side tonic-clonic seizures lasting less than ten minutes each. He presented 8 months before this admission a severe headache of acute onset during a period of heavy smoking of marijuana, associated with one generalized tonic-clonic seizure. He consulted at a Health Dispensary where he was prescribed, without any brain imaging phenobarbital: 100 mg/day and paracetamol for pain, but his compliance to treatment was poor. However, he did not have any seizure until this consultation. He had a history of regular marijuana smoking for 26 years, but no history of recurrent headache or seizures in childhood and in his family. There was no notion of alcohol intake or head trauma before the onset of symptoms. On admission, his vital signs revealed a blood pressure of 110/80 mmHg, a pulse rate of 104 beats per minute, a respiration rate of 18 breaths per minute, and a temperature of 37.2°C. Neurologic examination revealed an arouse patient, with psychomotor slowing. Pupils were equal and reactive. We found a bilateral and asymmetric hyperreflexia predominant on the left body side, bilateral Babinski sign, but the muscle strength was normal. The cardiac examination revealed a regular tachycardia without murmurs. Urine analysis showed a high level of-9-tétrahydroxycannabinol (-9-THC) superior to 150 ng/ml. Full blood count, Erythrocyte Sedimentation Rate, C-reactive protein level, fasting blood sugar, serum urea and creatinin levels, liver function test, serum levels of sodium, potassium, calcium and magnesium, HIV and syphilis serologies were all normal. CSF analysis was also normal. An electrocardiogram was done and showed a sinus tachycardia with a heart rate of 102 beats per minute. An

electroencephalogram (EEG) performed four days after the last seizure was normal. A brain MRI on day six after the last seizure showed on FLAIR images bilateral and symmetric striatal hyperintensity and right sided focal hyperintensities of insular cortex, and subcortico-frontal region (Figure 1) on T2* images revealed a right fronto-polar region hypointensity (Figure 2). MRI angiography was normal.

On admission patient was boarded on Carbamazepine: 200 mg bid, and clobazam: 5mg bid for two weeks. A psychiatric consultation was done for marijuana withdrawal. The patient was discharged after twenty days of admission with Carbamazepine 200mg bid. After three months of follow-up he did not present any epileptic seizure, and the pulse rate became normal.

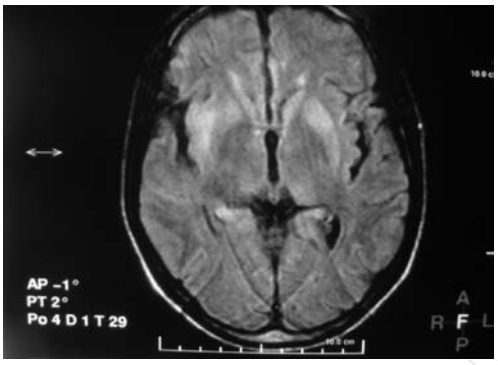

Figure 1: Brain MRI showing right sided focal hyperintensities of the insular cortex and subcortico-frontal region, and symmetric bilateral striatal hyperintersity on FLAIR image.

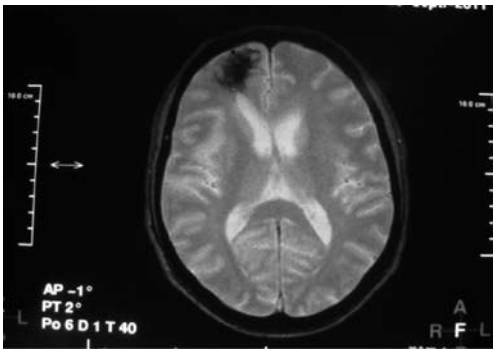

Figure 2: Brain MRI showing hypointensity of the right fronto-polar region on T2* image.

Discussion

This patient presented with late onset epileptic seizures with a notion of chronic marijuana use. The duration and frequency of marijuana smoking, the presence of tachycardia, diffuse hyperreflexia and psychomotor slowing are features of marijuana abuse. The detection of high level of Δ9-THC in urine indicates marijuana smoking within the last couple of weeks. The asymmetric pattern of hyperreflexia and focal onset of seizures are in favor of a focal brain lesion. The presence of cortico-subcortical hyperintensities around the right frontal lesion and basal ganglia in the periictal period could correspond to transient periictal MRI abnormalities (TPMA). These abnormalities are located around epileptic foci and /or basal ganglia during the periictal period [6]. The epileptic focus in this case is probably around the right frontal lesion. Canas and colleagues reported a clinical, electroencephalographic and TPMA concordance in 38.6% of cases [6]. Cannabis abuse has been correlated with reduction of grey matter volume in amygdala and hippocampus on voxel based morphometry brain imaging [7]. A follow-up brain MRI could have permitted us to follow MRI abnormalities in our patient, but it was not performed due to economic reasons.

The relationship between marijuana and epileptic seizures in this case is probably indirect since marijuana seems to have no direct epileptogenic properties [4, 5]. Marijuana could then favor epileptic seizures through epileptogenic brain lesions or play as a trigger factor for pre-existing epileptic seizures.

Questions concerning the mechanism of the right frontal lesion and its eventual relationship with marijuana abuse are addressed. Given that this lesion fits with a vascular territory (right anterior cerebral artery), is in favor of a vascular mechanism. The T2* hypointensity in this lesion suggests bleeding, either an old hemorrhagic stroke or hemorrhagic transformation of an ischemic stroke. However, an unrecognized traumatic brain injury cannot be formally ruled out, even if there is no notion of head trauma.

Rare cases of hemorrhagic and ischemic stroke attributed to acute use of high doses of marijuana have been described in the literature [8, 9]. Chronic marijuana smoking is also considered as a cerebrovascular risk factor [10]. Stroke in marijuana abusers occurred mostly in young adults without other cardiovascular risk factors, who were not taking other drugs, and who had recently increased their use of marijuana [9]. The onset of symptoms during a period of high marijuana consumption, age, and the absence of other cardiovascular risk factors in this case, corresponds to the clinical characteristics of marijuana-induced stroke. The incriminated mechanism of marijuana induced stroke is a toxic cerebral angiopathy with vasospasm associated with or without hypotension or hypertension [8-10].

Conclusion

The relationship between epilepsy and marijuana abuse remains unclear. Marijuana abuse could lead to epileptic seizures either indirectly through epileptogenic brain lesion(s) or play as a trigger factor for pre-existing epileptic seizures. There is a need for large population studies assessing epilepsy in marijuana abusers to help unravel this issue.

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