Atypical Cerebral Infarction in a Patient Suspected Ingestion of Synthetic Cannabinoids

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ABSTRACT
Background. Synthetic cannabinoids are recreational street drugs with many known adverse effects.
Case presentation. Here we present the case of an atypical cerebral infarction in a patient with a suspected ingestion of synthetic cannabinoids.
Conclusion. Although synthetic cannabinoids use is not conventionally associated with stroke, some case reports describe cerebral infarction and myocardial infarction with significant synthetic cannabinoids intake. Emergency physicians should know the association of synthetic cannabinoids with seizures, myocardial infarction, and now possibly ischemic stroke.

Key words: stroke; cannabinoids; synthetic cannabinoids; case report

INTRODUCTION
Synthetic cannabinoids are recreational street drugs with many known adverse effects, including tachycardia, vomiting, agitation, confusion, hallucinations, diabetes, seizures and myocardial infarction (1). Some authors reported seizures, supraventricular tachycardia, and acute myocardial infarction following synthetic cannabinoid use (2). Several reports suggested that cases of cerebral ischemia were associated with the use of synthetic cannabinoid (3). Here we present the case of an atypical cerebral infarction in a patient with a suspected ingestion of synthetic cannabinoids.

CASE PRESENTATION
A 47-year-old woman was referred to our Emergency Department (ED) due to right gaze preponderance and neglect to left side symptom. She had visited another hospital ED before due to vaginal bleeding and headache which had lasted for 2 days. 1 hour and 30 minutes after admission, right gaze preponderance and neglect to left side symptom were developed. The National Institutes of Health Stroke Scale was 10 (Best gaze 2/ Visual 2/ Facial palsy 2/ Sensory 2/ Extinction 2). Brain Computed Tomography (CT) showed low attenuation of right posterior cerebral artery territory, choroid plexus, and periventricular white matter. However, CT findings were not correlated with patient’s symptoms, Magnetic Resonance imaging (MRI) was performed. The perfusion delay with near occlusion of the distal M1 of the right middle cerebral artery and the basilar artery territory were observed. Based on these findings, hemodynamic and embolic infarction were suspected. Intra-arterial (IA) thrombectomy was planned due to intravenous tissuse. Plasminogen Activator could not be used because of vaginal bleeding. It was not possible to perform IA thrombectomy in that hospital, so the patient was transferred to our hospital.
The patient was admitted to our ED 3 hours and 40 minutes after right gaze preponderance and neglect to left side symptom occurred. Mental status was alert at that time, vital signs were stable. On neurologic examination, motor grade was IV in left upper extremity, sensory was decreased on left side. Laboratory findings showed metabolic acidosis (pH 7.219, HCO3- 8.9 mmol/L, Base excess -19 mEq/L) and anemia (hemoglobin 6.9 g/dL), others were not remarkable. To observe interval change, MRI including angiography were performed. It revealed acute infarction at the right temporo-occipital lobe, parietal lobe, basal ganglia and thalamus (Figure 1). However, it was slightly different from the stenosis site of the intracranial artery seen in the previous time-of-flight image, the neurologist decided not to perform IA thrombectomy. Cerebral infarction was treated with aspirin and atorvastatin, metabolic acidosis treated with hydration and continuous sodium bicarbonate infusion. The patient was transferred to the intensive care unit. Despite sodium bicarbonate infusion, metabolic acidosis with the high anion gap got worse and Continuous Renal Replacement Therapy (CRRT) was initiated. Urine toxicology screening test was performed under possibility of substance induced metabolic acidosis. The results showed Delta-9-tetraydrocannabinol positive findings. According to the family’s statement, the patient took herbal medication, an unknown ingredient for her diet. Despite treatment for stroke and CRRT for metabolic acidosis, brain herniation progressed to comatose mental status and the patient was declared brain-dead on the sixth day of admission.

DISCUSSION
Synthetic cannabinoids are easily obtainable at convenience stores, smoke shops, gas stations, and on the internet, and labeled as “herbal blends”, “air fresheners” or “incense”, often with the warning “not for human consumption” (1). Both on the internet and at head shops, they are generally sold in the form of chemical sprayed on plant materials in United States. Synthetic cannabinoids have recently been increasingly used in Asia as novel psychoactive agents. In Korea, it is not surprising that the lack of experience in synthetic cannabinoids raises concerns regarding their toxicities.

Public health risks of synthetic cannabinoids are of great concern due to known variability in potency in “K2” and “SPICE” products (4). As marijuana is the most fre-
gen consumption, and increased platelet constriction, increased myocardial oxygen consumption, and increased myocardial infarctions include hypotension, smoking history, family history of stroke, cardiac arrhythmias, or coagulopathy disorder. Emergency physicians should know the association of synthetic cannabinoids with seizures, myocar-
dial infarction, and now possibly ischemic stroke. History regarding the possibility of synthetic cannabinoids use should be explored carefully in the case of unexplained stroke events, especially in young patients with low risks of presenting stroke symptoms.

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Not applicable.

Consent for publication
We could not obtain a written consent from a patient because the patient had already died. We could not contact her kin despite the effort. Patient identifiable data has been withheld.

Competing interests
The authors declare that they have no competing interests.

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