

## **Synthetic cannabinoids induced psychotic episode as differential diagnostic challenge: clinical case**

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### **Abstract**

In order to highlight a problem of differential diagnostic of primal psychotic episode which induced by "smoking mixtures" intoxication, the case of a primary psychotic episode of schizophrenia due to the use of cannabinoids, which is primarily qualified as acute polymorphic psychotic disorder with symptoms of schizophrenia has been described. As a result, the issue of clinical differential diagnosis of the genesis of acute polymorphic psychotic disorder with symptoms of schizophrenia induced by synthetic cannabinoids was revealed.

**Key words: cannabinoids, smoking mixtures, primal psychotic episode**

**Introduction.** Until early 2000th, cannabinoids could only be indirectly attributed to hallucinogenic psychoactive substances, since impaired perception and hallucinatory images with a transition to oneiric stupor of consciousness was an extremely rare effect of a massive overdose of marijuana alkaloids, which was almost impossible to achieve with traditional consumption by smoking. Rare descriptions of such conditions have been associated with the consumption of large amounts of marijuana alkaloids extract, used enteral [2, 3].

Since, so-called “smoking mixtures” appeared on the territory of Ukraine and other east Europe countries, positioned as a legal analogue of marijuana, the problem of primary psychotic episode nosological identification became extremely relevant [4].

The reason for the increased interest of researchers in “smoking mixtures” was the extremely high frequency of psychopathological disorders that occur both in a condition of acute intoxication and in the distant period after consumption, what created the problem of differential diagnosis of exogenous psychoses and debuts of endogenous mental disorders such as schizophrenia [7].

Studies conducted in 2008-2009 showed that the effect of "smoking mixtures" is not due to its herbal components, but to synthetic agonists of cannabinoid receptors of various chemical nature. The most famous brand that supplied “smoking mixes” to the territory of Ukraine was “Spice”, the name of which became a nominal [4].

In 2009, after the discovery of synthetic cannabinoids in Spice smoking blends, authorities began to perform measures to ban these compounds.

Based on legislative restrictions, manufacturers of synthetic cannabinoids began to use the structure of a substance in which a particular chemical group is modified, making it possible to state the difference between a newly obtained compound and a prohibited one in order to gain access to the market, bypassing a direct violation of legal norms, which indicates a periodic change in the chemical structure of the produced agent after it is added to the register of narcotic substances. This practice lead to the formation of a dynamically changing and extremely diverse pool of synthetic cannabinoids that sold under the same brand name, but having a variable chemical structure that determines the differences in biological effect, narcogenic potential, pharmacodynamic and pharmacokinetic characteristics, which is also accompanied by the high psychotomimetic potential [4, 6].

The most active constituents of “smoking mixtures” are synthetic compounds of the “JWH” group (JWH-007, JWH-015, JWH-018, JWH-019, JWH-073, JWH-081, JWH-098 and others) and the so-called “non-classical” Cannabinoids – CP 47497 and its homologues [1, 3].

The effect of synthetic cannabinoids on the human brain is currently not well understood due to the combination of the effects of psychoactive substances with incompletely established mechanisms of action and unknown additional effects, what lead to a significant polymorphism of acute intoxication states and induced psychotic episodes [6, 7].

**The objective:** to highlight a problem of differential diagnostic of primal psychotic episode induced by "smoking mixtures" intoxication.

**Results and discussion.** As a clinical illustration, a case of a primary psychotic episode of schizophrenia due to the use of cannabinoids is given, which is primarily qualified as acute polymorphic psychotic disorder with symptoms of schizophrenia.

Patient N. (25 years old).

Anamnesis. No specific data about behavior violations before current hospitalization. Last month consumed "smoking mixture" which he bought by internet (anonymous telegram channel). The effect of consumption patient later described:

*"The first sensation is pressure in the head on the background of an accelerating heartbeat. It was replaced by numbness of the whole body. All this was a prelude to an overwhelming wave. A wave that turns consciousness into a stream of mixed thoughts, emotions, images and sounds. Everything around was seen from a different perspective, it seemed that you were looking at things and seeing them as if for the first time. Words by themselves, jumping out of the larynx, rhymed and lined up in alogisms"*.

6 days ago without any reason including any drug consumption patients behavior became abnormal – loose sleep, refused to eat any food, start to looking for "technical devices" hidden inside the walls of his apartment. Confessed to his wife, that he is under influence of "secret service agents" who testing psychic weapon on him. Patient hospitalized psychiatric hospital inpatient department.

Mental status. Patient orientated correctly. The verbal contact is possible, but only a part of direct questions are answered, some ignored or skipped by spontaneous monologue speech. Emotionally inconsistent, smiles and immediately becomes tensed reacting to some internal stimula, mumbles something. Speech is accelerated and hardly destructured. Thinking brutally violated up to state of disruption, with paradoxical logic. Declares delusive ideas of poisoning and persecution: *"I have irradiated lungs, the liver, have been irradiated for a long time with a thermal imager ... the voices are in the right half of the head, then in the left ... I have a bug in my left head ... I have more than a thousand voodoo needles under my heart and a needle in cerebellum, and each time they inject me with something"*; *"I didn't take pills, because they are poisoned, in the package, half of the tablets were facing down, those were poisoned"*; *"criminals who want to kill me will soon come to my house, someone wants to get rid of me"*.

Diagnosis: "Acute polymorphic psychotic disorder with symptoms of schizophrenia induced by synthetic cannabinoids" (ICD-10: 23.1).

Follow-up: despite the antipsychotic therapy, the condition remained unstable for a 14 days, there were periods of improvement and worsening, complained about the effects of

other patients, “teeth are crumbling because of this,” refused to take pills, “they need to be checked, they don’t taste like that” He declared that he possesses extrasensory abilities, repeatedly suggested that doctors “do an organ scan.” He repeatedly stated that he had been “spoiled”, “Gene has moved into me, I feel how he acts on me, forbids smoking, talking.”

From day 15 condition of a patient shown positive dynamics in terms of regress of positive and cognitive violations. Thinking become structured. Delusive ideas faded to reminiscences of some sleep-like condition that don’t completely understand by a patient. Hallucinations reduced to separate phenomena “*I rarely hear the echoes of human voices inside my head*”. Behavior stabilized.

After 21 days of treatment patient has been moved to outpatient department in condition of stabilized behavior and absence of productive psychopathological symptoms. Due to a weakening of emotional reactions and lack of motivation to basic activities, condition of a patient should be differentiated between post-psychotic exhaustion and negative symptoms of schizophrenia.

Comment: The structure of psychopathological symptoms and their dynamics, even over a sufficiently long period of time, are indistinguishable in both conditions. Cases when synthetic cannabinoids are used by the patient to correct their mental state (primarily the use of stimulating and euphoric properties to self-treat premorbid negative symptoms) make differentiation extremely hard. Meanwhile, therapeutic tactics and prognosis for these conditions are radically different, which requires, first of all, a clear understanding of the spectrum of possible effects of synthetic cannabinoids.

### **Conclusions**

In the field of narcology, naphthoylindoles, phenylacetylindoles, naphthylmethylindoles, cyclohexylphenols and other synthetic cannabinoids are subject to the formation of addictive states resulting in severe somatic and psycho-pathological consequences. In the field of psychiatry – the issue of differential diagnosis of the genesis of acute polymorphic psychotic disorder with symptoms of schizophrenia induced by synthetic cannabinoids in people aged 18-30 years is extremely relevant due to the high rates of schizophrenia debut and active consumption of synthetic cannabinoids.

### **References**

1. Deng H., Verrico C. D., Kosten T. R., Nielsen D. A. *Psychosis and synthetic cannabinoids* // Psychiatry Res. 2018. № 268. P. 400–412.
2. D'Souza D. C., Radhakrishnan R., Sherif M. et al. *Cannabinoids and Psychosis* // Curr Pharm Des. 2016. № 22 (42). P. 6380–6391.

3. Every-Palmer S. *Synthetic cannabinoid JWH-018 and psychosis: an explorative study* // Drug Alcohol Depend. 2011. № 117 (2-3). P. 152–157.
4. Kurdil N. V., Lutsenko O. H., Markova S. O. et al. *Syntetychni kanabinoidy spais: aktualni pytannia klinichnoi diahnostyky ta ekstrenoi medychnoi dopomohy* [Synthetic cannabinoids Spice: topical issues in clinical diagnosis and emergency medical care]. *Medytsyna neotlozhnykh sostoianyi*. 2016. № 2. P. 100–104.
5. Lafaye G., Karila L., Blecha L., Benyamina A. *Cannabis, cannabinoids, and health* // Dialogues Clin Neurosci. 2017. № 19 (3). P. 309–316.
6. Murray R. M., Englund A., Abi-Dargham A. et al. *Cannabis-associated psychosis: Neural substrate and clinical impact* // Neuropharmacology. 2017. № 15 (124). P. 89–104.
7. Papanti D., Schifano F., Botteon G. et al. *“Spiceophrenia”: a systematic overview of “spice”-related psychopathological issues and a case report* // Hum Psychopharmacol. 2013. № 28 (4). P. 379–389.