

# The Clinical and Dynamic Characteristics of Acute Psychosis Following the Use Synthetic Cannabinoids

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**Abstract:** The article presents the results of research into the clinical and dynamic characteristics of psychosis following the use of synthetic cannabinoids (SC). The aim of the study is a clinical-dynamic analysis of 348 psychotic conditions following the use of synthetic cannabinoids involved 173 patients. The results of the study are: we describe the stages of psychosis development and psychosis delirious, delirious-oneiroid and amnesia-like clinical variants; we demonstrated that the pathokinetic patterns of psychosis following SC use are determined by a complex of clinical, biological and socio-psychological factors; we found that the severity of clinical variants of the psychosis and consciousness disorders positively correlated with psychopathological conditions accompanied by more and more severe disorders of psychic activity (affective disorders – illusions and pareidolias – hallucinations – delusions – psychic automatism – ‘motor disorders’) with simultaneous gradual depletion of psychosis psychopathologic picture resulting from the narrowing spectrum of psychopathological symptoms.

**Keywords:** New Psychoactive Substances, Synthetic Cannabinoids, Spice, Psychosis

## 1. Introduction

In recent decade, the structure of the drug market in the world, including Russia, changes towards a higher percentage of synthetic psychotropic substances also known as “new” psychoactive substances (NPS). From September 2014, Russia reported cases of mass intoxication with an unknown PS. In Kirov Region, in the city of Surgut and in Khanty-Mansi Autonomous Area - Yugra, over 2000 patients were admitted in the emergency departments of community hospitals with the diagnosis “Intoxication with an unknown substance”, over 40 patients died. The urine tests revealed MDMB-CHMICA (MDMB (N)-Bz-F-trimethyl acid of cannabiod synthetic group JWH) [1-2].

The largest and rapidly growing group of NPS is synthetic cannabinoids (SC). [2-4], which have high narcogenic

potential, quick and highly gradient addiction [5-6]. Federal Drug Control Service of Russia seized NPS during anti-drug raids in Kirov, Vladimir, Orenburg, Smolensk and Smolensk regions and Khanty-Mansi Autonomous Area - Yugra [7].

SC user are mostly admitted in toxicology/acute intoxication departments at community hospital where “acute intoxication” rather than psychotic disorder diagnosis is established. That explains the lack of the Russian and international research into the clinical dynamics of psychoses following SC use, though there are indications to high occurrence of psychoses in SC users. [8-18].

## 2. Study Objective

Research into clinical and dynamic characteristics of psychotic conditions following SC use, Moscow, Russia.

### 3. Materials and Methods

The study involved the inpatients (n=80) with psychic and behavioral disorders following SC use treated in the National Scientific Center of Narcology (NSCN, a subsidiary of the Federal State Budgetary Institution "V. Serbsky Federal Medical Research Centre for Psychiatry and Narcology" of the Ministry of Health of the Russian Federation) in 2014-16. The study also involved the medical records of the patients (n=93) with "spice/K2 intoxication" who were treated in healthcare facilities in the city of Surgut, Kirov and Vladimir Regions in September-November 2014. The total number of participants was 173.

Following ICD-10 criteria, the participants were stratified into 2 groups: the patients with harmful SC use (n=61; 35.3%); 2) the patients with SC dependence syndrome (n=112; 64.7%).

The chemical and toxicological tests (the Analytic Toxicology Laboratory, NSCN -146 samples, the Forensic Laboratory, the All-Russian State University of Justice, Ministry of Justice of the Russian Federation- 27 samples) revealed SC, mostly JWH, AB-PINACA and TMCP.

The patients were predominantly males (n=154; 89.0%). The mean age was 25 (range 18-45, SD=0.1).

The study object was 348 psychotic conditions in the examined patients in the present clinical trial (n=80), or described in the medical records (n=93) or analyzed in the histories (n=175).

The psychic conditions significantly more frequently resulted from SC intoxication (n=96; 56.3%) followed by abstinent disorders (n=109; 31.3%) and delayed debut psychosis up to 20 days after SC use (n=43; 12.5%).

The study involved clinical-anamnestic, clinical-psychopathologic, laboratory-instrumental and statistic methods. The patients were quantified with psychometric test scoring.

### 4. Results and Discussion

The clinical dynamics of a psychotic condition following SC use included several consecutive stages: a) Stage 1 or Affective Stage. characterized by the affects raging from emotional depression and euphoria or by the hypomaniac condition with unreasonable joy, excessive talkativeness, uncontrollable associations, excessive attention deviation, motor anxiety, rapid and incoherent speech, psychic hypersthesia; b) Stage 2 or Illusionary and Hallucinatory Stage was characterized by multiple brightly colored and rapidly changing pareidolias which readily transformed into colorful and dynamic visual hallucinations accompanied by single hearing, tactile and general sense deceptions of perception with coherent content, sensual delusion, quickly changing mimics, which reflected the content of psychopathological experience, labile affect; c) Stage 3 or Deep Psychic Activity Disorganization Stage was characterized by full detachment of the world, deep disintegration of thought, fragmentary hallucinatory and delusory disorders, incoherent and

sketchy verbal activities disassociated from external factors, decreased mobility.

The several cases of delayed debut psychoses (n=24) had a prodromal period manifested with sleeping disorders (superficial sleep with frequent awakenings, horrifying nightmares) changing affect with predominant anxiety affect, asthenic disorders, single tonic-clonic (n=3) or abortive (n=4) seizures.

The comparative clinical and dynamic analysis of consciousness disorder depth and psychopathological structure reveals 3 clinical variants of psychoses 1) delirious (n=147, 42.2%); 2) delirious-oneiroid (n=149, 42.8%); 3) amentia-like (n=52, 15.0%).

A delirious psychosis (n=147, 74.0%) manifested itself with false orientation in the environment, colorful and dynamic pareidolias, scene-like visual hallucinations single tactile and hearing deceptions of perception. The patients observed but were not involved into false events. We observed fragmentary imaginative delusions, changing affects with predominant anxiety and horror accompanied by speech and motor excitement.

The clinical picture of a delirious-oneiroid psychosis (n=149, 42.8%) included dream-like consciousness disorder with overwhelming oneiroid fantastic hallucinatory and delusional experiences, disorientation in place and time and double orientation in personality, time perception disorder. Self-consciousness was changed and deeply disordered. The patients perceived themselves as participants of fantastic events, which took place in their imagination, fully submerged in the experienced images. The feeling of reality was lost, the environment did not attract their attention, and there was an expression of surprise or horror, anxiety, fear, directly connected with the content of their psychopathological experiences. The patients demonstrated catatonic disorders in the forms of substupor, catalepsy and single episodes of motor excitement in bed. The patients looked detached and inhibited; sometimes they walked deep in their thoughts with "enchanted smile", from time to time the patients were motionless, their movements were scarce and slow, the expression of their faces looked frozen, sometimes the patients made "flying" or "swimming hand" movements.

Amentia-like psychotic conditions (n=52; 15.0%) manifested themselves with high degree of consciousness disorder with the depletion of all types of psychic activity. The patients were deeply disoriented in place, time and personality. They were confused, they could not interpret nor understand the current events, they perceived fragments of the environment, did not remember their names did not recognized themselves in a mirror. We observed single incoherent visual and hearing hallucinations without a definite topic and elements of incoherent fragmentary imaginative delusions. We found expressed disintegration of all thinking components and disruption of self-consciousness. The rapid speech consisted of single incoherent words. The thinking and speech were incoherent. The patients' emotions were inadequate and inconsistent and often change their

polarity. The patients' mood was unstable, enthusiasm turned into tearfulness and/or emotional depression. The motor excitement in bed was manifested by repetitive stereotypic jerks and wincing. The patients' movements were pointless, inconsistent, often sprawling. We did not observe any lycid intervals, short-time delirious structural episodes were reported in the evening and at nights.

In all the patients, the psychosis resolution was lytic through long deep sleep. The adequate therapy ( $6 \pm 0.3$ h) and several hours of sleep resulted in the psychosis symptoms resolution. In several cases ( $n=69$ ; 17.9%) we observed post-psychotic asthenia in the form of sleepiness, weakness, distraction and cognitive functional decrease after  $5 \pm 1.7$  days following the psychosis resolution. The resolution of oneiroid psychosis was followed by several days of residual delusion (19).

We did not observe amnesias after delirious or delirious-oneiroid psychoses and the patients in detail reproduced the content of psychotic experiences but did not remember the real situation. The amnesia-like psychoses were followed only by single and fragmentary memories of psychopathological experience.

None of the patients ( $n=80$ ) hospitalized and treated in the present clinical trial died.

The psychosis duration varied: 12-24h following SC intoxication, 36 hours in the patients with withdrawal syndrome, 72h in patients with delayed debut. The mean duration of psychoses was  $1 \pm 0.42$  days.

To perform a comparative clinical analysis and to design a preventive strategy for each clinical variants of psychoses following SC use, we selected parameters from all studied signs (social-psychological, clinical biological and clinical psychopathological) which conditionally characterize the clinical development scenario of psychotic state following SC use.

A delirious psychosis followed SC intoxication ( $r=0.67$ ) and SC withdrawal syndrome ( $r=0.61$ ). It also developed in SC or other PS dependent patients ( $r=0.67$ ), and in patients with higher level of baseline tolerance ( $r=0.58$ ) or with combined personal and endogenic pathologies ( $r=0.79$ ), and in case of a large single SC dose ( $r=0.69$ ), lack of organic psychic disorder in the morbid period ( $r=0.58$ ), organic central nerve system damage ( $r=0.57$ ) and somatic comorbidities ( $r=0.78$ ).

A delirious oneiroid psychosis correlated with delayed debut period ( $r=0.67$ ), combined personal and endogenic pathologies ( $r=0.68$ ), no or single and asystematic use of SC and other PS in history ( $r=0.73$ ), low baseline tolerance to PS ( $r=0.63$ ) and lack of clinically significant somatic and neurological comorbidities ( $r=0.78$ ).

An amnesia-like psychosis occurred predominantly within the withdrawal syndrome period ( $r=0.57$ ), in SC dependent patients ( $r=0.78$ ), in patients with somatic ( $r=0.69$ ) and neurologic comorbidities ( $r=0.72$ ), organic psychic disorders ( $r=0.68$ ), and low baseline tolerance ( $r=0.73$ ).

## 5. Conclusion

The psychoses following SC use develop both within a SC dependence syndrome, and in patients with no or single SC or other PS use in all phase conditions associated with SC use: in the state of intoxication, within a withdrawal period and with delayed debut after up to 20 days following SC use. A psychosis clinical type and probability is determined by a setoff clinical-biological, clinical-pathological and social-psychological factors.

The comparative analysis of the psychopathological structure of the isolated clinical psychosis variants following SC use revealed that the severity of clinical variants of the psychosis and consciousness disorders positively correlated with psychopathological conditions accompanied by more and more severe disorders of psychic activity (affective disorders – illusions and pareidolias – hallucinations – delusions – psychic automatism – ‘motor disorders) with simultaneous gradual depletion of psychosis psychopathologic picture resulting from the narrowing spectrum of psychopathological symptoms.

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