

## **ICE Induced Psychosis: A Prevalence Study in Local Ice Abusers (BDF160050)**

### **Executive Summary**

The objective of this study was to determine the prevalence of ICE induced psychosis (IIP) and psychotic symptoms, as well as the prevalence of mood and anxiety disorders, in local users of methamphetamine (ICE). Two hundred and sixty participants were recruited from July 2017 to July 2019. All ICE users were invited to a 40–90 minute face-to-face structured diagnostic interview to examine their psychiatric condition. Demographic, clinical and drug use data were also collected.

A majority of the subjects were male and unemployed, with a mean age of 30, and with 10 years of education. Three-quarters of them were single and 70% were current smokers. The subjects were recruited from the Counselling Centres for Psychotropic Substance Abusers (CCPSAs) and residential treatment centres. More than half of the subjects were living in public housing, and some of them reported a family history of psychiatric illness.

The mean age of first ICE use of the entire sample was 21.6. The mean duration of ICE use was 5.7 years. The average number of days of ICE use in lifetime was 1234. Total ICE consumption in subject's lifetime was 1837 grams. Lifetime consumption in one day was 1.2 gram. Ninety percent of subjects had lifetime ICE dependence.

All of the subjects were poly-drug users. The three other most commonly used drugs were cannabis (70%), ketamine (64%) and cocaine (53%). The age of first use of other drugs ranged from 18 to 21 years, and the duration of drug use ranged from 2 to 5 years. The average number of days of drug use per month in the subjects' regular use period ranged from 9 to 21. Current dependence on these drugs was rare (0.0%–3.6%).

Three-quarters (75.8%) of the subjects had lifetime ICE induced psychotic disorder (IIP). IIP refers to paranoid-hallucinatory states induced by ICE, which are largely indistinguishable from acute paranoid schizophrenia. A small proportion of the subjects had other psychoses, namely schizophrenia or delusional disorder. IIP was related to more frequent ICE use ( $p = 0.004$ ) and higher total consumption ( $p = 0.007$ ) in the previous month. Current and lifetime ICE dependence were also related to IIP. In the logistic regression, both current (OR = 7.987) and lifetime (OR = 3.255) dependence on ICE were found to be independent predictors of IIP.

Ninety-one per cent ( $n = 238$ ) and 31.4% ( $n = 72$ ) of ICE users had lifetime and current psychotic symptoms respectively. In terms of the pattern of psychotic symptoms, 126 (48%) subjects had transient psychotic symptoms (TPS), defined as those that disappeared 1 to 14 days after their last ICE use. Forty-six (18%) subjects had persistent psychotic symptoms (PPS), wherein the time that elapsed between their last use of ICE and the day of assessment was  $146.9 \pm 83.7$  days (range 6–334 days). Sixty-four (25%) had psychotic symptoms and were not yet in the detoxification stage. One subject had flashbacks.

In terms of subtypes of psychotic symptoms, more than three-quarters of the subjects reported lifetime delusions (76%) or hallucinations (77%). Delusion of reference (65%) was the most common delusion, followed by persecutory delusion (42%). Auditory hallucination was the most common type of hallucination (59%), followed by visual (42%) and tactile (33%) hallucinations. Seventeen per cent of the sample reported thought broadcasting. Negative symptoms were rare.

Subjects with psychotic symptoms had higher lifetime consumption of ICE in one day (1.2 vs 0.6 grams), total consumption (412 vs 211 grams), total consumption/body weight (6.7 vs 3.2 grams/kilogram) and consumption in one day (1.1 vs 0.6 grams) in the past 2 years. Moreover, the group with psychotic symptoms were more likely to have lifetime ICE dependence (95% vs 52%). With regard to use of other substance, subjects with psychotic symptoms were more likely to have lifetime use of cannabis (71% vs 39%) and cocaine (56% vs 26%). In the logistic regression, lifetime ICE dependence was found to be an independent predictor of psychotic symptoms (OR = 13).

Subjects with PPS and TPS did not differ in terms of demographics. In terms of ICE use pattern, the PPS group had higher total consumption (754 vs 383 grams), consumption per body weight (12.0 vs 6.4 grams/kilogram,  $p=0.016$ ) and consumption in one day (1.8 vs 1.0 grams) in the past two years. The PPS group was more likely to report lifetime cannabis use (81% vs 64%). In the logistic regression model, ICE consumption (OR = 1.8) in one day in the past two years and lifetime cannabis (OR = 2.9) use were independent predictors of PPS.

Lifetime substance-induced mood disorder was also common, and was found in 59% of the subjects. The predominant presentation was depressive episodes (39%). The prevalences of lifetime diagnosis of major depressive disorder and bipolar disorder were 8% and 10%, respectively. Subjects with lifetime substance-induced mood disorders were older and more likely to be referred from non-residential centres. In terms of ICE use pattern, subjects with mood disorders had higher numbers of days of ICE use in the past two years. Moreover, they were more likely to have lifetime ICE dependence. Lifetime cannabis, cocaine or ecstasy use was also related to substance-induced mood disorder. In the logistic regression model, lifetime dependence (OR = 3.176), cannabis use (OR = 2.483) and age (OR = 1.041) were significant independent predictors of substance-induced mood disorder.

Lifetime substance-induced anxiety disorder was found in 64% of the subjects. Obsessive compulsive features were the most common presentation (62%), followed by phobic symptoms (23.5%). In contrast, non-substance-related anxiety disorders were uncommon. Subjects with lifetime substance-induced anxiety disorders were more likely to be female and unemployed. In terms of ICE use pattern, subjects with anxiety disorders had a younger age of initiation and longer duration of ICE use. They were also more likely to have lifetime ICE dependence, and lifetime use of cocaine and ketamine. In the logistic regression model, lifetime ICE dependence (OR = 4.990) and female gender (OR = 2.187) were independent predictors of substance-induced anxiety disorder.

In terms of the level of psychopathology, the mean Beck Depression Inventory (BDI), anxiety subscale of the Hospital Anxiety Depression Scale (HADS-A) and Severity of Dependence Scale (SDS) scores of all subjects were  $16.0 \pm 11.7$ ,  $5.8 \pm 4.8$  and  $7.7 \pm 3.3$  respectively. The mean Brief Psychiatric Rating Scale (BPRS) score was  $20.2 \pm 4.4$ ; 1.5% of the sample were rated as mildly to moderately ill (score 31–41), and only 0.4% of the subjects were rated as markedly ill (score above 53). The mean score of the Positive and Negative Symptoms Scale (PANSS) was  $32.6 \pm 5.7$ . The positive, negative and general psychopathology items in the PANSS scores were  $7.5 \pm 2.2$ ,  $7.8 \pm 2.7$  and  $17.2 \pm 2.6$ , respectively. None of the subjects scored higher than 95 (markedly ill) in PANSS, one of the subjects scored more than 75 (moderately ill) and another scored 58 (mildly ill). Days of ICE use in the current month and lifetime ICE dependence predicted the BDI score. Current and lifetime ICE dependence, ICE consumption in one day in the past 2 years and numbers of days of ICE use in the past one year were independent predictors of the HADS-A score. Finally, lifetime ICE dependence predicted the SDS score and marital status predicted PANSS positive score.

In conclusion, IIP was very common in local ICE users. ICE dependence increased the risk of IIP. Psychotic symptoms, such as delusions and hallucinations, were also very common in local ICE users. Approximately one-fifth of users had persistent psychotic symptoms. The amount of ICE consumption was a risk factor for persistent psychotic symptoms. Lifetime mood and anxiety disorders were frequent as well. The predominant presentations were depressive episodes and obsessive compulsive features. Risk factors for mood and anxiety disorders were ICE dependence, age and female gender.