

CLINICAL APPLICATION OF XENON THERAPY IN PATIENTS DUE OPIOID WITHDRAWAL SYNDROME

Sergey Shamov¹, Boris Tsygankov¹, Raisat Gadjieva¹ & Maksim Zemskov²

¹A.I. Evdokimov Moscow State University of Medicine and Dentistry, Moscow, Russia

²The Moscow Research and Practical Centre for Narcology, Moscow, Russia

People with the disorder opioid use, a growing number of emergency conditions, such as hemodynamic instability, disorders of external respiration, aspiration syndrome, seizures, sepsis, multiple organ failure and suicidal behavior. This tendency might be associated with different factors, including appearance of some new toxic synthetic opioids; combination of taking opioids, alcohol, cocaine, benzodiazepines and other psychoactive drugs together; premorbid disorders (HIV, hepatitis B and C, chronic sepsis, encephalopathy, etc.); high tolerance and atypical reaction of some patients on drug therapy.

The main problem is usually the treatment of withdrawal syndrome. In the International Standards for the Treatment of Drug Use contain specific recommendations. Pharmacological treatment for opioid withdrawal includes short term treatment with methadone and buprenorphine, alpha-2 adrenergic agonists (clonidine or lofexidine). In the Russian Federation, the use of opioid receptor agonists is illegal.

Unfortunately, traditional approaches to the treatment of opioid withdrawal syndrome are not effective enough. In the doses necessary to suppress severe withdrawal symptoms, Clonidine causes persistent hypotension, bradycardia, reduced stroke volume, conduction in the atrio-ventricular node, atrial fibrillation. Clonidine has little effect on the affective component of withdrawal syndrome, and completely devoid of hypnotic effect. In view of this, there are unmet needs in searching for effective and safe strategies for the treatment of urgent conditions due to the opioid withdrawal syndrome.

The goal of this study was to define the feasibility and clinical utility of using the xenon therapy for prevention and treatment of urgent conditions due to the opioid withdrawal syndrome. Xenon is a natural inert gas providing the strong analgesic effect. It is also non-toxic and quite safe as for the environment as for the main organs of the human body. Moreover, it does not have any mutagenic or teratogenic properties and might be regarded as a natural adaptogen.

During the ten years (2001-2010) 30 patients with the different severity of opioid withdrawal syndrome was treated by xenon (group 1). In contrast, another 30 patients with opioid withdrawal syndrome took traditional treatment (group 2). The two groups did not differ from each other in clinical and demographic variables. In the first group patients we have not found out any urgent conditions leading them to bring to the intensive care unit due to severe hemodynamic and respiratory disturbances.

Pain and anxiety-depressive syndromes were more likely to stop just after the first session of xenon therapy and it had been lasting for the next 4-6 hours. As a result, there is no need to use xenon more than 4 times per a day. During the second and the third day of treatment the number of sessions had decreased to 1 or 2 per a day. Moreover, in the first group of patients all signs of opioid withdrawal syndrome had stopped during the five days. On the other hand, among the second group patients we were more likely to expect the reducing of withdrawal syndrome between 10 and 12 days. In addition to that, 2 patients of this group were characterized by the development of delirium and 4 patients had severe hemodynamic and respiratory disturbances leading them to the intensive care unit.

In conclusion, our data confirmed the clinical utility of using xenon therapy in patients due to the opioid withdrawal syndrome. In addition, we haven't found out any adverse events while using xenon with other drugs. Xenon therapy is effective even in patients at high risk of acute conditions due to opioid withdrawal syndrome.