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Dear clinicians, research fellows, colleagues and friends!

The prevalence of drug addiction and its asocial manifestations poses one of the acutest global problems. According to World Health Organization (2019), abuse of alcohol, drugs and other substances affecting the consciousness has reached the *epidemic* proportions in the beginning of 21st century.

On the global scope the consumption level of drugs remains high: in 2010 the illicit substances were at least once consumed by about million people or about 6% of the population of Earth aged from 15 to 64 years old. According to modern statistics in Russia about 670 thousands of active drug users (231,6 on 100 000), however, according to some experts this number can reach 2,6 million (or about 2% of the population). The correlation between registered drug addicts, episodic consumption of drugs and psychotropic substances and *hidden* addicts is described as 1:3:5. In the last decade the estimated mortality rates among drug users has increased tenfold. Female ratios among drug users has increased in 6,5 times, whereas deaths in adolescents — in 42 times. Independent specialists reported that in Russian cities only 5–7% of drug users are considered cured (withholding drugs more than one year).

The problem of drug addiction is getting younger and it is closely connected with the spread of HIV. The Russian Federation has the highest HIV prevalence, even higher than in African countries.

According to international statistics every year two-hundred-thousand people die from drug-related causes [World Drug Report, 2015]. Furthermore, life expectancy of a heroin addict is not more than 7 years.

The narcological situation to date is characterized by a decrease in consumption of opioid group while the growth in consumption of synthetic psychoactive substances among young people. According to the early warning system (the European Monitoring Centre for Drugs and Drug Addiction) in 2010 there were 41 new psychoactive substances, in 2011 — 49 and in 2012 — 73.

Synthetic cannabinoids were found as most common (39,3%), followed by synthetic cathinones (16,6%) and phenylethylamines (14,1%). As a consequence of the fact that only certain substances and not the classes of substances can be prohibited and are subject to law, manufacturers offer the consumers new compounds including the ones with unknown chemical structures.

New psychoactive substances are available and are in demand among drug users as they are supposed to be legal, cheap and with limited health risks. These subjects are not detected by standard immunological tests. For example, synthetic cannabinoids are not detected with a standard THC-test and they are not detected with ELISA-test on amphetamine. Only small part of psychoactive subjects is detectable with a standard methamphetamine test. The ring of piperazine, whose composition contains some substances, produces mixed results in the standard amphetamine test. More sophisticated methods are normally used to screen for psychoactive substances, mainly the method of Gas Chromatography Mass Spectrometry (GC-MS) and liquid chromatography–mass spectrometry (LC-MS/MS).

Therefore, an adequate test may be only performed either in a toxicological laboratory or a forensic institution.

With the help of certain biochemical markers specialists can evaluate susceptibility to drug addiction alongside with metabolites of drug substances

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and products of altered body metabolism. Assessment of such markers enables to make prognosis and set up preventive measures. This is targeted, in general, on struggling with drug addiction.

All biomarkers can be classified into 3 categories: drug substances and the products of their metabolism, markers of biochemical response on the syndrome model of addiction, genetic and epigenetic biomarkers associated with susceptibility to development of the addiction,

Among most perspective molecules there are neurotrophic factors (brain-derived neurotrophic factor, glial cell line-derived neurotrophic factors), other specific nerve tissue proteins (galanin, protein s100, neuron-specific enolase, alpha-synuclein), markers for neurotransmitter disorders, indicators of the in-flammation intensity, including markers of oxidative stress, indicators of vascular damage as well as genetic and epigenetic biomarkers, such as serum microRNA and DNA methylation.

In this issue you may read about new data on markers of endogen intoxication and oxidative stress in patients with problem drug use. Qualitative and quantitative evaluation of the markers of oxidative stress allows conducting laboratory monitoring of metabolic disorders in patients with opioid addiction, to control effectiveness of the therapy and rehabilitation and to predict possible complications and relapse.

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