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Studies on Anti-alcohol Activity of DMPS and DMSA with the help of model reactions

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We consider vicinal dithioglycols (VDs) as the most promising anti-alcohol compounds. DMPS (sodium 2,3-dimercapto-1-propanesulfonate) and also DMSA (meso-2,3-dimercaptosuccinic acid) belong to them. ZOREX®, an oral remedy, containing DMPS as the main active agent, is produced in Russia as OTC. It is a remedy that helps eliminating the post-alcohol intoxication (hangover) and is sold at premium. We consider that VDs possess a wider anti-alcohol potential. It means that they can modify acetaldehyde (AA) reactions with biogenic amines. Alcohol dependence disease is caused by the products of the AA reaction with biogenic amines, first of all – with dopamine (DA). The ability of any substance to inhibit these reactions and to decrease the products output of these reactions can point out its anti-alcohol activity. We study with the help of IR spectroscopy methods reactions of interactions in double („AA-biogenic amine") and triple ("AA-biogenic amine-VD") systems. We consider these reactions as model reactions proceeding in a human body by alcohol intoxication and whilst taking VD. DA and DMPS are mostly interesting in these systems. The pharmacokinetics of DMPS was firstly studied 60 years ago in the USSR (Prof. Petrun'kin V.E.), after that – in China and the USA. The newest data were presented in the USA (Maiorino R.M., Aposhian H.V., Hurlburt K.M. et al.). It was found out, that injection administration leads to the quick (10-15 min.) and relatively accomplished (85-90%) transformation of DMPS in its disulfide derivatives. When DMPS are administered orally, the transformation into disulfide derivatives does not take place so quickly. During experiments on animals, we found out that, DMPS passing through the liver has, moreover, some time to modify reactions proceeding in the presence of AA, because of the fact that the main metabolism of ethanol takes place in the liver. Adding DMPS into the system „DA-AA" in the model reactions significantly inhibits the reaction of interaction between DA and AA and decreases the output of the reaction product (tetrahydroisoquinoline). Adding DMPS disulfide derivatives into the "DA-AA"- system, on the contrary, accelerates the reaction and leads to the increase of the output of the reaction product. This means, that the oral administration method guarantees the DMPS anti-alcohol activity, while the injection administration method can lead to the pro-alcohol activity.

Biography

Sergei M. Zenovich is a senior researcher at the Institute of Narcology at V. Sebsky Federal Medical Research Centre of Psychiatry and Narcology of the Ministry of Health of the Russian Federation. He graduated from Lomonosov Moscow State University. He obtained his Ph.D. (Biology) from the National Scientific Centre of Narcology, Russia. He has had about 20 years of experience in research of antialcoholic compounds and initiated discovery of a new properties of DMPS and DMSA for treatment of disorders caused by alcohol intake: both hangover and (sub) chronic intoxication. He has obtained patents, and has patent applications in the area of alleviating post-alcoholic state and preventing alcohol dependence formation.

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