

Theoretical Papers And Monographs

GENETIC POLYMORPHISM OF ALDEHYDE DEHYDROGENASE-2 (ALDH2) AND PATHOPHYSIOLOGICAL AND CLINICAL IMPLICATIONS OF ACETALDEHYDE

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ABSTRACT – Alcohol is one of most frequently used beverages, and its regular consumption is associated with many diseases. Acetaldehyde - the main metabolite of ethanol shows numerous toxic, mutagenic and carcinogenic properties. Disclosure of these properties depends on extent of production of acetaldehyde, which results not only from amount of alcohol intake and enzymatic activity of alcohol dehydrogenase but also from the rapidity of its elimination by aldehyde dehydrogenase (ALDH). Of 12 isoenzymes of ALDH the major role in biotransformation of acetaldehyde is played by mitochondrial isoenzyme ALDH2. The gene coding ALDH may occur in active or non-active form with subsequent occurrence of partial (allotype ALDH2*1/2) or entire (allotype ALDH2*2/2) loss of ALDH2 activity. ALDH2 mutation is strongly associated with racial affiliation. In this review article we present recent ideas on the significance of genetic ALDH2 polymorphism for pathomechanisms of hepatic injury, diseases of cardio-vascular system, bronchial asthma, Alzheimer disease and cancers developing in aerodigestive tract in alcoholics.

Key words: aldehyde dehydrogenase, polymorphism, acetaldehyde, ethanol.