D-Penicillamine, an Acetaldehyde Sequestering Agent, Reduces Ethanol Preference in Alcohol-Naïve Rats


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In previous investigations, we demonstrated that D-penicillamine (DP), a sulfhydryl aminoacid which has been studied as sequestration agent of acetaldehyde (ACD), is able to prevent the alcohol deprivation effect (ADE) but not voluntary ethanol consumption. Both results were obtained in long-term ethanol-experienced Wistar rats. Based on a previous paper, reported by Karahanian et al., the main goal of this research was to evaluate the voluntary ethanol consumption pattern in rats that had no previous experience in alcohol intake in presence and absence of DP. Twenty-four two-month-old male Wistar rats from our own breeding colony were used. Animals were subcutaneously implanted with a miniosmotic pump delivering DP at a dose that previously showed efficacy in preventing relapse (n = 12) or vehicle (n = 12). After surgery, animals were exposed to a non-operant alcohol self-administration model based on a four bottle free choice paradigm. Under these experimental conditions, the effects of DP treatment on the voluntary ethanol consumption were evaluated. Control rats showed an alcohol preference of 36.9 ± 1.4%, while systemic DP administration (1 mg/h) led to a significant reduction, 27.8 ± 3.6%, of their ethanol preference. Curiously, the total alcohol intake, expressed as g/kg/day, was not be reduced. In conclusion, present data indicate that DP is not able to reduce voluntary ethanol consumption, although a decreased preference for ethanol solutions was detected. Changes in particular preferences for each ethanol solution displayed by these animals explain the obtained outcomes.