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### The effect of hard drinking water with elevated concentrations of Calcium or Magnesium on Renal functions and metabolism in rats

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There are conflicting data in the literature on the impact of hard drinking water, due to the high content of magnesium or calcium salts, on various organs and systems. In connection with the above, the aim of this work was to study the effects of prolonged consumption of drinking water with high content of ions Ca<sup>2+</sup> or Mg<sup>2+</sup> on hydro- and ionuretic renal functions and biochemical parameters of blood plasma in Wistar rats. 3 groups of animals were studied: control animals on standard feed and water consumption (Ca<sup>2+</sup> = 20 mg/dm<sup>3</sup>; Mg<sup>2+</sup> = 6 mg/dm<sup>3</sup>); and 2 experimental groups, consuming for 5 weeks water with an increased concentration of Ca<sup>2+</sup> (120 mg/dm<sup>3</sup>) or Mg<sup>2+</sup> (70 mg/dm<sup>3</sup>). Renal function was studied by collecting background urine samples within 4 hours and 3 hours after oral 5% of body weight water load. At the end of the experiment, blood was collected to assess the homeostatic parameters of plasma. The concentrations of electrolytes and osmotically active substances in urine and plasma were determined using the methods of flame photometry and cryoscopy. Calculation of water and ionic renal functions was carried out according to the generally accepted formulas. Set of indicators characterizing the rat's response to long-term drinking water intake with a high content of Ca<sup>2+</sup> or Mg<sup>2+</sup>, leads to the conclusion that after 5 weeks of such water consumption there was an activation of osmo-regulatory mechanisms in both experimental groups.

The difference between the ion-regulating indicators in experimental groups compare to control was expressed to a greater degree following the consumption of drinking water with a high magnesium content. Water loadings reduced the stress of osmo- and ion-regulating mechanisms, probably due to increase of dilution process. These results indicate the influence of surplus cations intake on osmo- and ion-regulating mechanisms of water-mineral balance.

#### Biography

Aizman Roman Idelevich, is a Doctor of Biological Sciences, Professor, Honored Worker of Science of Russia, Head of the Department of Anatomy, Physiology and Safety, Director of the Institute of Health and Safety. He is a member of 3 dissertation councils for doctoral theses, a foreign member of the American Physiological Society, a valid Member of the European Society of Pediatric Nephrology, associate editor of two scientific journals. Under his leadership 8 doctoral and 40 candidate's theses on problems of developmental and renal physiology, physiological-hygienic effects of drinking water were defended. He is a author of over 500 scientific and methodical works, including 28 monographs, 90 manuals, 367 articles in refereed journals and 16 proposals, patents, registration certificates. He is awarded diplomas of the Ministry of Education of the Russian Federation, Ministry of Emergency Situations, the Administration of the city and region (Novosibirsk) the Medal "Property of Siberia", K.D. Ushinsky medal.

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