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Urinary excretion of exogenous glycerol administration at rest.

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Since 2010, glycerol has been ruled a masking agent by the World Anti-Doping Agency and consequently its administration is prohibited in sports. A detection method is available but little is known about the urinary excretion following administration. Fourteen well-trained cyclists (27.0 ± 5.4 years; VO(2max): 63.9 ± 8.5 ml/kg/min) were administered glycerol (1 g/kg body mass + 25 ml water/kg body mass) and placebo (25 ml water/kg) in a cross-over study. Blood and urine samples were collected before administration and after 2.5, 4, and 6.5 h. Urine samples were further collected up to 24 h post-administration. Following glycerol administration, urinary glycerol increased from 10.9 ± 15.5 to 50581 ± 23821 μg/ml within 2.5 h. In the placebo group, urinary glycerol did not exceed 26.8 ± 31.3 μg/ml. Urinary concentrations in the glycerol group were significantly higher than in the placebo group for 16.9 ± 1.0 h. In comparison to placebo, glycerol caused a larger increase in body weight (0.69 ± 0.42 vs. 0.27 ± 0.44 kg; $p < 0.05$) and a reduced urine output (972 ± 379 vs. 1271 ± 387 ml; $p < 0.05$). Reductions in haemoglobin and haematocrit were significantly greater after glycerol (-0.60 ± 0.28 g/dl; -1.7 ± 0.7%) than after placebo administration (-0.29 ± 0.39 g/dl; -0.9 ± 1.1%). The study shows that glycerol administration was detectable in urine for several hours. Even though there were significant reductions in haemoglobin and haematocrit after 2.5 h, the plasma expansion by glycerol appeared rather marginal in comparison to placebo.

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