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Gastrointestinal uptake of FDG after *N*-butylscopolamine or omeprazole treatment in the rat

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Objective: Gastrointestinal (GI) uptake of 2-[^{18}F]-fluoro-2-deoxy-D-glucose (FDG) is frequently observed in whole-body positron emission tomography (PET) images. Such physiological uptake may interfere with accurate interpretation. The aim of the present study was to determine whether physiological gastrointestinal FDG uptake can be decreased by means of an antiperistaltic agent, *N*-butylscopolamine, or a gastric secretion inhibitor, omeprazole. ***Methods:*** Sprague-Dawley rats were divided into three groups: omeprazole-treated (n = 6), *N*-butylscopolamine-treated (n = 7), and control group (n = 6). The rats in the omeprazole-treated group were administered omeprazole (1.0 mg/kg) intravenously 45 minutes before FDG injection. The rats in the *N*-butylscopolamine-treated group were administered *N*-butylscopolamine (1.0 mg/kg) intramuscularly 10 minutes before FDG injection. Sixty minutes after FDG injection under overnight fasting state, the gastrointestinal tissues were excised and weighed to determine the radioactivity of ^{18}F using a gamma counter. ***Results:*** The mean values of FDG uptake in the esophagus, stomach, small intestine, cecum and colon of the *N*-butylscopolamine-treated group vs. the omeprazole-treated group were 148% vs. 162%, 109% vs. 113%, 113% vs. 88%, 102% vs. 85%, 105% vs. 70% of the control group, respectively. There were no statistical differences in FDG uptake rate in the esophagus, stomach, or cecum among the three groups. FDG uptake rates in the small intestine and colon of the omeprazole-treated group were significantly lower than those in the control group. ***Conclusion:*** Physiological FDG uptake in the GI tract was not decreased by the administration of *N*-butylscopolamine. Omeprazole was effective in decreasing FDG uptake in the small intestine and colon. Omeprazole has a potential to decrease FDG uptake rate in a limited part of the GI tract.

Key words: FDG, PET, *N*-butylscopolamine, omeprazole, physiological uptake