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The effect of oral contrast on large bowel activity in FDG-PET/CT

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Purpose: The purpose of this study was to determine the effect of oral contrast on FDG uptake in the colon and to determine the normal distribution of FDG in the colon. ***Methods:*** Sixty patients (30 patients in no contrast group and 30 patients in the received contrast group) underwent FDG-PET/CT scans. The pattern of FDG uptake was classified into 5 patterns (diffuse, segmental, single-nodular, multi-nodular, and other) in 5 segments (ascending, transverse, descending, and rectosigmoid colon). SUVs of the no oral contrast group were examined. The ratios of FDG uptake patterns were compared in the received contrast group and no contrast group to evaluate the effect of oral contast. The effect of attenuation correction on the uptake pattern was evaluated by comparison of the attenuation-corrected and non-attenuation-corrected PET images. ***Results:*** In the no contrast group, there was no significant uptake in 72 segments (59%) and a diffuse pattern was seen in 29 segments (24%), most frequently in the ascending colon and descending colon. A segmental pattern was seen in 15 segments (13%), most frequently in the rectosigmoid colon. A single-nodular pattern was seen in 3 segments (3%) and multi-nodular pattern in 1 segment (1%). A nodular pattern was seen only in the ascending colon. SUV_{max} of the ascending colon and that of the rectosigmoid colon were significantly higher than those of the transverse and descending colon. The frequencies of diffuse, multi-nodular and 'other' patterns were significantly higher in the received contrast group than in no contrast group. There was no significant difference between the frequency of the segmental pattern or the single nodular pattern in the two groups. There was no significant difference between the uptake patterns with attenuation correction and those without attenuation correction in either the received contrast group or no contrast group. ***Conclusion:*** Normal FDG uptake in the large bowel may show various degrees and patterns of uptake among the colonic segments. Oral contrast agent can cause focal or diffuse increased FDG uptake, which may be induced not only by the high CT density of oral contrast but also by an accelerated physiologic reaction of the large bowel.

Key words: FDG-PET/CT, oral contrast agent, colon, artifact