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Background

Recently, ^{18}F -fluorodeoxyglucose (FDG) positron emission tomography (PET) has been used to examine muscle activity during running. Dash is a basic activity in various kinds of sports but differs from running in terms of the intensity and severity. The purpose of this study is to evaluate the muscle activity during running at full speed using FDG PET.

Methods

Six healthy males were investigated during a dash for 10 minutes after intravenous injection of FDG (37 MBq). Another 6 healthy males were studied as controls. PET images were obtained 45 minutes after the FDG injection. Regions of interest (ROI) were drawn on the anterior and posterior thighs, and the anterior and posterior legs. The standardized uptake value (SUV) was calculated to examine the FDG uptake of muscle tissue per unit volume according to the equation.

Results: In the control group, the mean standardized uptake values (SUVs) of the anterior thigh, the posterior thigh, the anterior leg, and the posterior leg were 0.49 ± 0.04 , 0.44 ± 0.02 , 0.46 ± 0.05 , and 0.44 ± 0.07 , respectively. In the dash group, the mean SUVs of the anterior thigh, the posterior thigh, the anterior leg, and the posterior leg were 0.74 ± 0.20 , 0.79 ± 0.08 , 0.61 ± 0.07 , and 0.60 ± 0.08 , respectively. FDG accumulation of the every four compartment in the dash group was significantly higher than that in the control. FDG accumulation of the posterior thigh was significantly higher than that of the anterior and the posterior leg in the dash group ($p < 0.02$).

Conclusion: It was observed from our investigation that the posterior thigh muscles were especially activated during a dash.

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