Effect of dexamethasone on ^{18}F-FDG accumulation in subcutaneously produced inflammation and tumor in Donryu rat by using autoradiography

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Abstract

In this study, we investigated the effects of dexamethasone on the accumulation of ^{18}F-FDG (FDG) in tumor (ascites hepatoma cells: AH109A strain) and chemically induced inflammation nodules in Donryu rat by using autoradiography. Inflammations were experimentally induced by the subcutaneous inoculation of turpentine oil (10μl) on the back of rats (male Donryu rats, 7wks old, n=24). Also, AH109A (8×10^6 cells) were inoculated subcutaneously on the back of the rats. FDG (5MBq) was injected to the rats from tail vein 4 hours after intraperitoneal injection of dexamethasone. After 90 min of FDG injection, rats were euthanized under pentobarbital injection to remove nodules, and other reference organs including the liver, heart, and brain. The organ samples were then sliced by cryostat at 10μm thickness and put to slide glass. Imaging plates were used to monitor the radioactivity to calculate standardized uptake values (SUV). Histopathological evaluation of each tissue was also performed. In a histopathological examination, the major components of the cells were neutrophils and macrophages in the inflammation nodules. The tumor nodules were composed of small tumor island surrounded by the other majority of the cells which is so called framework that includes fibroblasts, lymphocytes, and capillary cells. The FDG accumulation in the framework was lower than in the tumor island. The dexamethasone treatment appeared to decrease SUV of FDG in both inflammation and tumor nodules, but it was not obvious in the images of autoradiography. And degree of the decrease of SUV in both tumor and inflammation nodules appeared almost similar and no clear difference.