INTRODUCTION AND AIM: We have evaluated the usefulness of positron emission tomography (PET) with the amyloid imaging radioligand [11C]Pittsburgh Compound B ([11C]PIB) to monitor amyloid deposition in the brain of two transgenic mouse models, APP23 and APP/PS1.

METHODS: Individual mice were repeatedly imaged with [11C]PIB at various ages from 7 to 18 months. Dynamic 60 min PET scans were performed using an Inveon Multimodality PET/CT -scanner and radioactivity ratios between frontal cortex, neocortex and cerebellum were calculated. Thioflavin-S staining and immunohistochemistry were used to evaluate the brain amyloid load.

RESULTS: Bound (cortex-cerebellum)-to-free (cerebellum) ratio at 40-60 min p.i. was increased in the APP23 mouse from 0.25 (7 months) to 0.50 (15 months) and finally to 0.76 (18 months). In APP/PS1 mice the ratio showed no increase, being 0.20 and 0.04 at 9 months and 0.07 and 0.17 at 12 months. Similar increases were seen in Logan DVRs with the APP23 mouse but not in the APP/PS1 mice. Only sparse small plaques were seen in APP23 brain at 12 months, while at 18 months, the cortex was densely populated. In contrast, APP/PS1 mice showed extensive plaque load already at 9 months.

CONCLUSIONS: [11C]PIB binding to amyloid deposits varies between different transgenic mouse lines used for Alzheimer's research.

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