

USEFULNESS OF I-123 ADAM IN CLICAL RESEARCH; Metabolism and early clinical results

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Aim: Iodine-123 ADAM is a novel serotonin transporter ligand (SERT). It has been shown to be more specific SERT tracer than previous I-123 CIT-derivatives. Our aim was to investigate metabolism of I-123 ADAM and evaluate the usefulness of this tracer in neuropsychiatric disorders.

Subjects and Methods: In five voluntary persons metabolism of I-123 ADAM was studied using both whole blood and plasma.

Imaging studies were carried out using a triple-head gamma camera. A template with predefined volume of interest (VOI) map for I-123 ADAM (MAP Medical Technologies) studies was used for automated registration of the scans and quantification of SERT binding. Specific binding ratios (SBRs) at five hours post injection were calculated as (counts in target region - counts in cerebellum)/counts in cerebellum. VOIs were drawn over midbrain, thalamus and some other interesting regions. So far, we have studied subjects with Asperger syndrome, bulimia, depression and healthy subjects for seasonal variation.

Results: The amount of unchanged I-123 ADAM in plasma was greater in voluntary persons pretreated with citalopram than in those without at 30 and 60 min after injection. The calculated percentage of unchanged ADAM in plasma after 2 hours was about 8%. The whole blood radioactivity ratio to plasma at 5 hours was 0.63, range 0.54 – 0.67. Lipophilic metabolites were detected using TLC only in a minor amount.

There was no evident of systematic seasonal variation in the SERT binding of I-123 ADAM of 12 healthy volunteers.

No statistically significant differences were found between 15 healthy volunteers (SBR for midbrain 1.89 ± 0.28) and 24 patients with Asperger syndrome (SBR for midbrain 1.79 ± 0.30).

The mean SERT availability for the midbrain was not different between 18 healthy volunteers (SBR for midbrain 1.90 ± 0.3) and 23 depressed patients with a variety of comorbid conditions (SBR for mid-brain 1.90 ± 0.4).

There were no differences in I-123 ADAM binding between 13 subjects with bulimia nervosa, their 6 healthy sisters and 19 control subjects. The lack of statistically significant results might be explained by mildness of our BN cases. However, the subgroup with symptomatic patients revealed an increased SERT level in the midbrain.

Conclusions: We have previously shown that I-123 ADAM is a selective SERT tracer and pseudoequilibrium is reached about 5 hours after post injection making semiquantative measurements possible. However, we could not find any statistically significant changes in SERT availability in previous patients groups except symptomatic bulimia patients.

Because ADAM is specific tracer for SERT binding, it might be that SERT abnormalities are not involved in many neurological disorders. It is also possible that internalisation of ADAM –tracer results undetected changes in SPET studies using this SERT tracer. Perhaps disturbances in various neuropsychological diseases can be found in other parts of the 5-HT signalling system in brain. Previous conflicting results in SERT-findings e.g. in depression could be caused by use of various unspecific SERT ligands such as I-123 beta-CIT derivatives.

