

# Serotonergic system in Alzheimer's disease

## Serotonergični sistem pri Alzheimerjevi bolezni

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### Abstract

Serotonin (5-hydroxytryptamine, 5-HT) has an important role in the regulation of the synaptic function, neurite outgrowth, synaptogenesis, and cell survival. It regulates different physiological functions, behaviors and mood. Post mortem studies have found the decrease in the brain concentration of 5-HT and its metabolites and the loss of serotonergic receptors in Alzheimer's disease (AD). A recent PET study suggests that the reduction of 5-HT-1A receptors in hippocampus precedes the clinical symptoms of AD and could be a sensitive tool for an early diagnosis. The reduced 5-HT concentrations in brain, CSF and platelets in AD suggest the decrease in 5-HT synthesis. Several reasons were proposed for this decrease. The results of our studies indicate that the more severe AD symptoms are associated with reduced platelet 5-HT concentration and lower MAO activity, particularly in the behavioral and cognitive symptoms of AD.

### Izvleček

Serotonin (5-hidroksitriptamin, 5-HT) ima pomembno vlogo pri regulaciji sinaptičnega delovanja, rasti nevritov, nastanku sinaps in preživetju celice. Uravnava različne fiziološke funkcije, vedenje in razpoloženje. V raziskavah, opravljenih posmrtno, so ugotovili znižanje koncentracije 5-HT in njegovih metabolitov ter serotoninskih receptorjev v možganih obolelih za Alzheimerjevo boleznijo. Študije pozitronske emisijske tomografije (PET) kažejo upad receptorjev 5-HT-1A v hipokampusu še pred pojavom kliničnih znakov Alzheimerjeve bolezni; omenjeni upad bi bil lahko občutljiv pokazatelj bolezni pri zgodnji diagnostiki. Znižana koncentracija 5-HT v možganih, cerebrospinalnem likvorju in trombocitih pri bolnikih z Alzheimerjevo boleznijo kaže na znižano sintezo 5-HT; možni so različni vzroki. Rezultati naše študije kažejo, da so hujši simptomi Alzheimerjeve bolezni povezani z znižano koncentracijo 5-HT in zmanjšano aktivnostjo MAO (monoamino oksidaze) v trombocitih; to še posebej velja za vedenjske in kognitivne simptome Alzheimerjeve bolezni.

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