I - 13

TRAINING AND PLASTICITY OF WORKING MEMORY

TORKEL KLINGBERG

Presentation Wednesday 10.30

Working memory is the ability to keep information in mind for a brief period of time, typically a few seconds. In daily life, we use working memory to remember plans or instructions of what to do next, and for controlling attention. Lower working memory is associated with distractability and deficits in working memory is a key deficit in attention deficit/hyperactivity disorder (ADHD).

Klingberg and collaborators have developed and tested a computerized method for training working memory. Several studies have shown that working memory can be improved by this method, and that this decreases the symptoms of inattention. This has now been confirmed by several, independent studies. Klingberg and collegues has also shown that training of working memory increases brain activity in frontal and parietal regions, and is associated with changes in the density of dopamine D1-receptors in the cortex.

Training of working memory might thus be a non-pharmacological way to address the key cognitive function of ADHD and thereby significantly and sustainably reduce the inattentive symptoms of this disorder.

Future question concern which other cognitive functions that can be trained, and how strong transfer is between functions. Training of inhibitory functions has given negative results, but one study with training of non-verbal reasoning in 4-year old children show evidence of transfer to non-trained reasoning tasks as well as working memory.

Torkel Klingberg
Stockholm Brain Institute,
Karolinska Institutet, 171 77
Stockholm, Sweden

Tel. +46 8-51776118
E-mail: Torkel.Klingberg@ki.se
www.klingberglab.se

Torkel Klingberg is (since 2006) professor of cognitive neuroscience at the Karolinska Institute, where he heads a research group in developmental neuroscience located at the MR-laboratory. His Ph.D. from 1997 was based on studies of working memory, and after completing a medical degree in 1998 he spent two years at Stanford University. His research is mainly based on neuroimaging studies. Torkel Klingberg's research is focused on the neural bases of cognitive development during childhood and training induced changes in brain function in both normal development and clinical groups such as ADHD. This includes the development of computerized methods for improving attention and working memory in children. Much of his research integrates neuropsychology and neuroimaging. He has written the popular science book The overflowing brain: information overload and the limits of working memory (2008).