results have lead to the hypothesis that a dysfunction of prefrontostriatal circuitry underlies this syndrome.

Recent studies have demonstrated a cognitive role for the cerebellum, including attention. Clinical data, such as subtle neurological signs or cerebellar-vestibular test impairement seen in children with ADHD, suggest that the cerebellum may also play a role in the pathophysiology of this syndrome.

Morphometric MRI studies have been conducted in 74 right-handed boys and girls with ADHD, and 87 healthy controls. Psychiatric interview and neuropsychological evaluation have been performed in every cases. Cerebellar and vermal volumes as well as vermal midsagittal area have been quantified using an image anlysis software. Three groups were collected together with the separate age and sex and handedness matched healthy controls over a 5 years period at the NIMH: 1) a group of boys with ADHD 2) a separate group of ADHD medication naive subjects 3) a group of ADHD girls.

Total cerebellar volume did not differ between ADHD and control groups. Within the 3 studies results were similar. Vermis midsagittal area and volumes were significantly smaller for ADHD subjects than for controls. This reduction involved particularly the posterior-inferior lobe (lobules VIII-X) in the three groups. These results remain significant after adjustment for total brain volume, age, or IQ (analysis of covariance).

The studies suggest that dysfunction of cerebellar-thalamo-prefrontal circuitry may subserve the motor control and motor inhibition deficits encountered in ADHD. Cerebellum may also play a role in executive function deficits, acting probably as a co-processor interfering with prefronto-striatal loop enhancing speed and efficiency. Further clinical analyses and functional imaging studies have to be conducted in to order to better understand neural networks involved in cognitive deficits in this syndrome.

S24-4

THE EFFECTIVENESS OF METHYLPHENIDATE ON ATTENTION PROCESSES IN ADHD CHILDREN

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It was investigated whether children with ADHD show abnormalities in early and/or late attentional processes, and in which way methylphenidate (MPH) influences such processes. Early attentional processes were studied in a selective attention paradigm, in both the auditory and the visual modality. The capacity of late attentional processing was studied in a visual dual task paradigm. During the tasks, event-related brain potentials (ERPs) were measured.

For each task, a group children with ADHD and a group normal control children, age 7–12, was measured. Thereafter, the ADHD children participated in a double-blind placebo controlled study, using the same tasks, in which the effects of 15 mg MPH were determined. With respect to early selection processes, it was found that ADHD children performed worse than controls in both modalities. Also, ADHD children showed smaller ERP-peaks which were related to early auditory selection processes. Effects of MPH, however, were most clearly seen in the visual condition.

With respect to later attentional processing, ADHD children showed worse performance. Evidence was found that ADHD children show a late attentional capacity allocation-defect. MPH had an enhancing effect on both performance and ERPs.

It was concluded that MPH has a non-specific ameliorating effect on performance and ERP-peaks, rather than alleviating specific defects.

S24-5

THE INFLUENCE OF METHYLPHENIDATE ON ATTENTION AND IMPULSIVITY OF ADHD-CHILDREN: A PHARMACOLOGICAL DISSECTION STUDY

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The effects of methylphenidate (MPH) on performance and ERP's in a selective attention task (Dichotic Listening), capacity-allocation task (irrelevant probe technique) and in a inhibition task (stop signal paradigm) were studied in 14, 14 and 16 schoolaged ADHD children. Besides the effect of methylphenidate, te effects of L-dopa and desipramaine on inhibitory-processes in 16 ADHD children were studied. Results showed that Methylphenidate enhanced performance on selective attention and cognitive evaluation but not oninhibition-task, while MPH enhanced PN and P_3 amplitudes. Desipramine (a noradrenergic agonist) was the only drug that influenced inhibition performance. Implications of these results will be discussed.

SEC25. Diagnosis and treatment of impulse regulation disorders in mentally retarded patients

Chairs: W Verhoeven (NL), S Tuinier (NL)

SEC25-1

DIAGNOSIS AND NEUROBIOLOGY OF IMPULSE CONTROL DISORDERS

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Impulse control disorders encompass a broad variety of behavioral disorders grouped together on a descriptive level because they have as common denominator an exacerbation of some sort of behavior. In clinical psychiatry disordered impulse control in a restrictive sense is closely linked to the so called personality disorders in spite of the fact that abnormalities on the behavioral level can occur in a variety of clinical conditions. The dimensional idea in biological psychiatry advocated the approach that biological dysfunctions may be linked to specific psychological dysfunctions irrespective the nosological context in which they occur. Meta analysis of these kind of studies revealed, however, that disturbed central serotonin metabolism is associated with impulsivity only within the context of other disorders e.g. personality disorders. In mental retardation treatment studies with serotonin modulating compounds (e.g. SSRI's and 5-HT1 agonists), targeted at behavioral disorders, show beneficial effects that can at least partly be explained by the effect on non-targeted aspects such as arousal, stress reactivity and sensory hypersensitivity. In a variety of cases modification of disturbed behavior seems to be secondary to the successful treatment of underlying neuropsychiatric disorders that may present with atypical symptom profiles. Especially syndromes not regularly thought, are of importance such as: unstable mood disorder, cycloid psychosis, stress feed-back resistance and unspecified bipolar disorder. So, in spite of accumulating data from

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