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Eggert P[1], Meir J[2]
1. *Klinik f. Allgemeine Pädiatrie, UKSH-Kiel,* ***2.*** *Klinik f. Kinder u. Jugendliche, Leipzig*

NEW ASPECTS ON THE CLASSIFICATION OF ENURESIS

Hypothesis / aims of study
The classification of the International Children´s Continence Society (ICCS) divides the children with enuresis in two major clinical groups: those children who wet their beds only at night belong to the monosymptomatic (mE) type and those who also suffer from daytime-incontinence are specified as a non-monosymptomatic (nmE) type of enuresis. However, the recommendations to treat daytime-incontinence and nocturnal bedwetting differ assuming that the phenomenons are two different diseases: bedwetting at night is treated by substitution of ADH, alarm therapy or seldom anticholinergics, whereas the daytime-incontinence is seen as a cause of a detrusor-overactivity and is usually treated with anticholinergics. Recent findings rather suggest a central etiology of enuresis: Bedwetting children have a weaker prepulse inhibition (PPI) than normal controls and the PPI increases during dDAVP-therapy, an ADH-analogue. This raises the question if the children with and without daytime symptoms differ in their central control (PPI) or not
Study design, materials and methods
The clinical differentiation between the two groups was made by a bladder diary.

Non-monosymptomatic group (nmE): present or amnamestic existance of daytime-symptoms such as urge, voiding frequency (>6-7/d), small voided volumes, changing voided volumes.

Monosymptomatic group (mE): acute or anamnestic hints for parasomnias (pavor nocturnus, bruxism, sleep walking) and absence of acute and anamnestic urge symptoms.

The startle reflex represents a motor reaction to sudden stimuli. A weaker prepulse 30-500 ms before the startle stimulus reduces the startle response (prepulse inhibition) and enables the organism to a controlled reaction. The prepulse inhibition (PPI) was used as a tool to investigate central control mechanism. The blink response – as the most reliable component of the startle reflex – was measured by an EMG of the *M. orbicularis oculi.* PPI was provoked by a weaker and shorter tone presented 60 ms before the startle stimulus. It is given as the percentage reduction of the blink response. The results of the two groups (19 nmE and 11 mE, age 5 to 14 years) were compared nonparametrical with each other.
Results
There is a difference between the two clinical groups.The children with nmE have a lower PPI-level than those with mE: Median (nmE): 10%; Median (mE): 73%, P=0,0002.
Interpretation of results
The presented findings confirm both: the theory of a central etiology of enuresis and the clinical classification of the ICCS. Beyond it they demonstrate new aspects on the classification of nocturnal enuresis: Daytime-symptoms and bedwetting at night seem not to be two different diseases. The results presented suggest that bedwetting at day and night in children with nmE occur both as a result of lower reflex-control mechanisms and an inferior ability to process sensory information. The appropriate therapy (dDAVP or alarm) should help these children with nmE to compensate their reduced ability of information processing. However, the monosymptomatic enuresis seems to be a totally different type. The coexistence of parasomnias in this form of enuresis indicate that the sleep in these children is special (confusional state of arousal) and should be the focus of further studies. The presented hypothesis seems to solve different still existing contradictions concerning the etiology of eneuresis and has an substantial impact on therapy concepts
Concluding message
The results presented suggest that daytime - symptoms and bedwetting at night occur both as a result of lower reflex-control mechanisms and an inferior ability to process sensory information. Monosymptomatic enuresis is strictly separated.

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Is this a clinical trial?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
This study did not require eithics committee approval because	**the non - invasive and unperilous measurements of the PPI did not affect diagnosis and therapy**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**