

PROSPECTIVE SLEEP STUDY IN CHILDREN WITH NOCTURNAL ENURESIS AND POLYURIA

Hypothesis / aims of study

To explore the impact of sleep fragmentation in children with primary monosymptomatic nocturnal enuresis and nocturnal polyuria. Sleep was investigated in relation to enuretic parameters: fluid intake, maximum and average voided volume, number of wet nights and nocturia. Secondly, we were interested in the comparison of the registered periodic limb movements and cortical arousals in sleep to previous findings in children with refractory nocturnal enuresis (1).

Study design, materials and methods

Children between six and 16 years with primary monosymptomatic nocturnal enuresis and nocturnal polyuria were recruited from the paediatric nephro-urology clinic. To determine the enuretic parameters, two diaries were completed. Fluid intake was evaluated by a daytime diary for four days and nocturnal enuresis was registered for 14 consecutive nights. Maximum voided volume was measured during one day of forced drinking. Measurement of uroflow and post-void residual volume were performed by ultrasound. A general demographic questionnaire was completed. All subjects participated in one overnight standardized video-polysomnographic study. The actual results regarding the periodic limb movements and cortical arousals in sleep were used to compare with those of the former pilot study (29 children, five to 19 years) with refractory nocturnal enuresis.

Results

The study group comprised thirty children with proven nocturnal enuresis and nocturnal polyuria (23 boys and 7 girls: mean 10,43 years \pm 3.08 SD). The mean periodic limb movement in sleep-index was increased: 10,83 \pm 4,99 SD. The mean arousal index and awakening index were 6.433 \pm 3.310 SD respectively 8.720 \pm 3.757 SD. No significant correlation was found between age, gender, social economic state, family size and the enuretic and sleep parameters. The periodic limb movement in sleep-index was positively correlated with the arousal-index and the awakening-index ($p < 0,001$). There was no significant correlation between these sleep and the enuretic parameters. Children with refractory nocturnal enuresis from the pilot study show a significant higher periodic limb movement in sleep-index and cortical arousal-index compared to the children from the actual study group, children with primary monosymptomatic nocturnal enuresis and nocturnal polyuria ($p < 0,001$).

Concluding message

Periodic limb movements and cortical arousals in sleep are increased in children with monosymptomatic nocturnal enuresis and nocturnal polyuria, but no correlation was found with the enuretic parameters. The presence of periodic limb movements probably constitutes a comorbid phenomenon, driven by a common but independent pacemaker. We hypothesize the autonomic system, its sympathetic branch, and the dopaminergic system as a candidate.

FIGURES

Enuretic parameters

	number children	of minimum	maximum	mean	Std. deviation
Av.Fluid intake	30	720,00	2537,50	1415,611	495,4288
Av.voided volume	27	133,33	512,50	278,816	108,8648
MVV	30	200,00	700,00	383,333	131,9243
nwet nights/w	29	0,00	7,00	4,192	2,5010
nwet nights or nocturia/w	29	0,70	7,00	5,215	1,8771
nNP	24	0,00	7,00	3,933	2,3831

Polysomnographic parameters

	Number of children	minimum	maximum	mean	SD
Arousal-index	30	1,2	13,9	6,433	3,310
Awakening-Index	30	1,8	15,2	8,720	3,357
PLMS-index	30	3,6	23,3	10,833	4,998
AH-index	30	0,0	11,0	0,693	2,004

Correlation coefficients: two by two combinations (** $p < 0,01$; * $p < 0,05$)

	A-index	AA-index	AH-index	PLMS-index
Fluid intake	-0.049	-0.051	0.503**	-0.117
Vv average	-0.114	-0.107	0.330	-0.262
Vv max incl	-0.085	-0.109	0.377*	-0.089
N_wet_nights	0.076	0.114	0.193	0.017
N_wet nights or nocturia	-0.155	-0.089	0.170	-0.049

N_nights	:	-0.120	-0.237	-0.028	-0.009
NP=100					
PLMS-index		0.744**	0.628**	-0.120	1.000

PLMS: periodic limb movements in sleep; A-index: arousal-index; AA-index: awakening-index; AH-index:apnea-hypnea-index

References

1. Abnormal sleep architecture and refractory nocturnal enuresis. K.Dhondt et al.J.Urol.2009 (182)

Disclosures

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