

ABSTRACT

Right Hemispheric Dysfunction Correlates With Non-Wakefulness in Attention Deficit Disorder

D.D. Duane, M. Clark, L. Gottlob

Institute for Developmental Behavioral Neurology / Arizona State University
Scottsdale / Tempe, Arizona

OBJECTIVE: To determine if lateralization of neurologic dysfunction correlates with non-alertness in attention deficit disorder.

BACKGROUND: Attention deficit disorder (ADD) of early childhood onset is characterized by variable degrees of inattention, impulsivity, and hyperactivity. Inattention may be associated with low vigilance and daytime hypersomnia (Weinberg & Brumback, J. Pediatrics, 1990). Daytime non-wakefulness is associated with fluctuation in pupil size which can be recorded precisely by pupillometry (Yoss et al, Neurology, 1970; Duane & Berman, Sleep Res, 1992; Keegan & Merritt, in press). In some instances, familial ADD with non-wakefulness is HLA-typing compatible with narcolepsy (Clark & Duane, Neurology, 1995). What otherwise distinguishes alert from non-alert ADD subjects is unknown.

DESIGN/METHODS: Retrospective analysis of 20 Caucasian ADD males (DSM-IV criteria), selected at random from a database of ADD subjects. Ten were awake (A), ten were non-awake (NA) by pupillometry despite sleep log evidence of no nocturnal sleep disturbance. Groups were matched for age (13 years +/- 2), Full Scale IQ (109 +/- 10), and socioeconomic status. Compared were Edinburgh Laterality Quotient (LQ), Children's Depression Index or MMPI D scale, arithmetic, reading: decoding/comprehension, writing wrist/hand posture (Duane et al, Annals Neurology, 1994), Verbal (V) vs Performance (P) IQ, Conners/Achenbach/DSM-IV Scores, Letter Cancellation Task, Rey Auditory Verbal Learning Test, Rey-Osterrieth Complex Figure, right vs left body motor signs (Denckla, Develop Med Child Neurol, 1974). G statistic was employed.

RESULTS: NA ADD differed from A ADD in more frequent: partial inverted writing wrist posture and strong right-handedness (LQ > +75) each $p < 0.01$; left lateralized LCT errors and depression $p < 0.05$; $P < VIQ$ $p < 0.01$; left lateralized body signs $p < 0.005$; A ADD more frequently were hyperactive $p < 0.05$.

CONCLUSIONS: This preliminary report corroborates the suggestion that non-wakefulness in ADD, like inattention, may relate to right hemispheric dysfunction (Voeller & Heilman, Neurology, 1988). Analysis of the remainder of the database is required before this conclusion can be considered validated. The relationship of mood disorder and nocturnal sleep architecture to these observations warrants clarification.

Poster Presentation: American Academy of Neurology, 48th Annual Meeting, San Francisco, CA. March 28, 1996

Duane DD, Clark M, Gottlob L. Right hemispheric dysfunction correlates with non-wakefulness in attention deficit disorder. Abstract. Neurology, 1996; 46 (supplement): A125.