



6th International IPWSO Conference
Cluj-Napoca 21.06.07 - 24.06.07
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Romanian Prader-Willi Association

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PRADER-WILLI SYNDROME AND OTHERS WITH EARLY-ONSET MORBID OBESITY SHARE SIMILAR STRENGTHS IN COGNITION AND ACHIEVEMENT

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INTRODUCTION: Individuals with PWS have been described as having mild to moderate mental retardation and multiple severe learning disabilities with relative weaknesses in short-term memory and mathematical skills and relative strengths in reading skills and on tasks that assess attention to visual detail, visual-motor coordination, perceptual planning, and spatial organization. Dykens and colleagues (*J. Am. Acad. Child Adolesc. Psychiatry*, 1992) found that the mean level of achievement for individuals with PWS was approximately 2 years above their IQ. However, Whittington et al. (*J. of Intellectual Disability Research*, 2004) reported that levels of achievement were lower than what was predicted based on IQ among individuals with PWS. Furthermore, our group (Miller et al., *J. Peds*, 2006) has recently demonstrated that individuals in general with early-onset morbid obesity have significantly lower general intellectual ability and lower achievement than a normal sibling control group.

METHODS: The Woodcock-Johnson Tests of Cognitive Abilities, Third Edition (WJIII-Cog) and the Woodcock-Johnson Tests of Achievement, Third Edition (WJIII-TA) were used to determine the extent to which individuals with PWS (n=17; age range 6-39 years), early-onset morbid obesity (EMO) of unknown etiology (n=19; ages 6-22 years), and their normal control siblings (n=18; ages 5-27 years) reached the attainments predicted by their IQ. In addition, the relative strengths and weaknesses of the 3 groups (PWS, EMO, and controls) were investigated. Extensive genetic testing was conducted on both the PWS (12 with deletions and 5 with UPD) and EMO subjects.

RESULTS: All 3 groups scored higher on their overall achievement score (TIA) than their IQ, but the difference between these scores was only significant ($p < .05$) for the PWS group (PWS: TIA = 67 and IQ = 63; EMO: TIA = 79 and IQ = 75; and Control: TIA = 109 and IQ = 108). The PWS and EMO groups did not score significantly different from each other on the Cognitive Efficiency and Phonemic Awareness clusters. The PWS and EMO groups scored significantly higher on their Verbal Ability, Thinking Ability, and Phonemic Awareness cluster scores (PWS: $p < .001$, $p < .01$, and $p < .001$, respectively and EMO: $p < .01$, $p < .05$, and $p < .001$, respectively) of the WJIII-Cog than would have been predicted from their overall IQ.

In terms of the WJIII-TA, the PWS and EMO groups did not score significantly different from each other on their TIA and Academic Skills cluster score. In addition, both the PWS and EMO groups scored significantly higher on their Oral Language and Academic Skills cluster scores (PWS: $p < .05$ and $p < .01$, respectively and EMO: $p < .001$ and $p < .001$, respectively) of the WJIII-TA than their TIA.

CONCLUSIONS: We found that individuals with PWS and EMO shared many similarities on their cognitive abilities and achievement scores. In particular, both groups scored significantly higher on their Phonemic Awareness cluster score compared to their IQ and on their Oral Language cluster score compared to their TIA. Our results indicate that the PWS and EMO groups have relative strengths in linguistic competency, listening ability, and comprehension. We are currently performing very detailed anatomic measurements of brain morphology



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from head MRIs to better understand the etiology of the strengths and weaknesses in cognition and achievement in the PWS and EMO groups with particular attention to the auditory/speech cortex.