

PRENATAL ALCOHOL EXPOSURE AND NEUROCOGNITIVE IMPAIRMENT IN ADOLESCENCE

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A CRITICAL REVIEW of “Neurocognitive impairment in early adolescence following prenatal alcohol exposure of varying duration.” Marit Korkman, Satu Kettunen, and Ilona Autti-Ramo; *Neurocognitive Impairment in Early Adolescence Following Prenatal Alcohol Exposure of Varying Duration. Child Neuropsychology 2003, Vol.9, No.2, pp. 117-128.*

This study was a continuation of the prospective, longitudinal study on children exposed to alcohol *in utero* by this group of researchers in Finland. The objectives of the original and current studies were to assess the neurocognitive status of the subjects and to examine whether duration of exposure continued to be predictive of outcome at different ages.

The children were divided into three subgroups corresponding with the duration of alcohol exposure during the pregnancy. Group I involved drinking during the first trimester; Group II during trimesters I & II, and Group III throughout the pregnancy. Neuropsychological assessments were completed when the children were two years of age (N=60) and five to nine years of age (N= 47).

The results of these assessments supported significant impairments in most tasks for group three although the specific nature of these differences between the two age groups were not well defined. However, the older sample reportedly displayed impairments on measures of naming, receptive language, attention and inhibition, visuomotor tasks, and learning manual motor series. Difficulties were also found on tasks of manual motor precision and memory. The Verbal IQ (using the WISC-R) did differentiate significantly between the groups, whereas the Performance IQ did not. It is not clear why a more updated version of the WISC III was not used in 1998 and what intellectual measure was used for those children who were just five.

With expected significant attrition over time (82 babies at enrolment), the present study re-assessed 27 children at the age of 12-14. The small sample size incorporated in each group (ranging from 11-7) might have some bearing on the overall interpretation of results. In addition, 11 of the children already had diagnoses of FAS or FAE using modified criteria. Despite referring to several authors, it is not clear which procedure was actually used with publication dates ranging from 1980- 1999. Because of the high frequency of children who had been taken into custody (15 of 27 children), the authors did acknowledge that it was not possible to control for socio-economic status. Namely the number of and kind of placements that the children had endured over the years was not controlled because of the intra-individual variability. This might render the results less reliable in restoring the nature-nurture question of those children who were provided with highly stimulating and supportive parenting versus those that experienced recurrent abuse, neglect or lack of attention.

Because there were no published norms for the older children (13 & 14 yrs of age), a group of 39 normal children were recruited in order to collect additional, preliminary normative data on the NEPSY Test. It is also not clear whether adding on these norms at a later time might pose some questions. The authors reassured their readers that the new control group did not differ significantly from the original Nepsy standardization group completed in 1997.

The findings supported widespread and generalized neurocognitive effects of alcohol exposure. In addition, the relationship between duration of alcohol exposure and neurocognitive development continued to be significant in early adolescence. The authors state that it seems that the common elements on tests that were performed most poorly were of relative complexity and high attentional and working

memory demands (attention, language, manual motor functions, visuospatial functions, and verbal memory and learning). With regard to findings that did not support "especially" higher levels of significance in selected areas of *attention* and *executive functioning* domains, I would agree that Attention does hold a special and "salient" position and is often considered a comorbid or underlying feature that will encompass not only behaviour but working memory and cognition as well. Attention is not as easily compartmentalized nor measured as a single entity on its very own. With respect to executive functioning, the important aspect of this dimension and its significant impact on development has also been well reported by both parents and teachers (on the BRIEF) and gathering such information from other sources has not been among the objectives of this study. Such results might have highlighted the importance of this construct in relationship to other variables.

With respect to differences in motor tasks between motor learning (Manual Motor Series Subtest) and Visuo Motor Precision, the current reader did not have the first test listed in her version of the NEPSY. Therefore the author's comments pertaining to the neural basis that might underlie the poor performance on this subtest could not be elaborated.

With regard to duration of drinking, the group (3) that was exposed to alcohol throughout the pregnancy performed well below the average range. This was also the group that included mainly children with FAS or FAE (8 out of 9 children). Despite the fact that the author could only quantify duration of alcohol exposure, it makes sense to conclude (as the authors have) that the mothers who were unable to stop drinking probably consumed the largest quantities of alcohol. In studies that require information about alcohol and the anecdotal comments pertaining to their life style and other comorbid conditions associated with alcohol consumption, prompts investigators to use such words as "highly suspected" and "most probable."

The three major methodological limitations of the study have been well identified by the authors. Once again, the extent to which "non optimal social background" contributed to the effects could not be established. Frequent changes

sometimes make it difficult to quantify social background but it can be done. Once again, if a child has been subjected to many moves, it is highly probable that the parenting he received was intermittent and disruptive. However, there are many children on the other hand who have been placed with a stable and nurturing family for an extended period of time. With an increased sample size, examining these multi-faceted factors might have been possible. The neurobiological effect of course can't be dismissed but it is still questionable how many of the children (in the different groups) of the original 82 mothers recruited would have been diagnosed with FAS or FAE. The authors do agree that it is unknown to what extent the present study group was representative of the original sample, as only a small part of the children participated in this study.

The last limitation pertains to test measures. For example, the Performance IQ was significantly higher than the Verbal IQ which was the reverse finding with the 5-9 year olds. Simply said and supported by the authors, it may be the increased emphasis on working quickly and accurately. The child is awarded extra points for a speedier performance even if they were accurate. The publication of the new WISC IV attempts to address this problem by the elimination of such scoring procedures. It is also interesting that the authors talk about the sensitivity of tests to different task demands at different ages. The broad age range (5-9) is a significant one and how the author reconciled the use of different tests to accommodate the different ages is still not clear (WPPSI III vs. WISC R or WISC III).