



American College of Neuropsychopharmacology

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Headline: Early life stressors adversely influence brain development

New brain imaging evidence was advanced in a series of presentations at the recent meeting of the *American College of Neuropsychopharmacology* supporting the long-held belief that stressful early life experiences, such as preterm birth, poverty and lack of familial support, adversely affect brain development. Using functional brain imaging, the speakers focused on how these stressors affect the development of vulnerable brain areas that mediate emotional responses and mood.

Two studies provided evidence that early life stress associated with poverty and lack of familial support may put youth at high-risk for developing depression. The first was from Dr. Erika Forbes (U Pittsburgh), who found that poverty and mothers with depressed mood led the prefrontal cortex of boys and girls to be less responsive to rewards later in life, leading the author to conclude that lower response to reward may predict higher vulnerability to depression in children raised under socially challenging conditions. Also, less emotional support from mothers during childhood predicted adolescent girls' depression via brain response to reward. Deanna Barch (Wash U) also examined the impact of poverty and maternal support on brain function in a longitudinal study of children 2-6 years of age who were re-examined annually for 11 yr. with 3 neuroimaging episodes interspersed. Lower socioeconomic status was associated with behavioral depression and reduced volume of the cerebral cortex, hippocampus and amygdala. Conversely, positive maternal support appeared protective, and mitigated this adverse effect of poverty on brain development in preschool children.

The final two presentations investigated the impact of early brain development on subsequent emotional and behavioral functioning. Cynthia Rogers (Washington U St Louis) examined children who were born prematurely (gestational age <30 weeks). Compared to newborn babies that were born on time, infants who were born prematurely (24 to 30 weeks' gestational age) had altered development of the white matter in their brains. This white matter is composed of the fibers that connect different regions of the brain and is essential to efficient brain function. When these premature children were 2 and 5 years old, they had greater deficits in attention and social communication than full-term children which was predicted by the changes in their white matter detected as infants, suggesting that early white matter impairments in early infancy can make children who experienced preterm birth more vulnerable to social and emotional deficits.

Finally, Alice Graham (OHSU) found that coordination between the functioning of the amygdala and prefrontal cortex - brain areas that are associated with emotional regulation- was

impaired in newborns who later developed behavioral problems. Her study, therefore, provided further evidence that early abnormalities in early brain development may be important predictors of later behavioral difficulties.

Together, the findings of these studies suggest that adverse early life experiences, such as poverty, preterm birth, and familial instability, adversely affect the development of critical brain areas that could increase the risk of later childhood psychopathology.

Presenters: Deanna Barch, Ph.D.
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