Developmental Psychobiology

Prenatal exposure to serotonin reuptake inhibitor antidepressants (pSRI) and maternal depression may be two early life events that shape prefrontal cognitive skills termed executive functions (EFs) central to attention, reasoning and self-control. Genetic variations in SLC6A4, a gene that codes for the membrane-bound serotonin transporter (5HTT) protein, also affects behavioral regulation. To look at longer-term effects of pSRI-exposure and whether such effects are moderated by SLC6A4 genotype, pSRI-exposed (N=26) and non-exposed (N=38) children (mean age 6.33 years) were studied using the Hearts and Flowers task to assess EFs, with trials treated as a repeated within-subject variable, and maternal mood (Hamilton Depression Scale: 3rd trimester and 6 years) as covariates. On the task block most demanding of EFs, children whose mothers were more depressed during pregnancy made more errors, regardless of SRI exposure. Within the pSRI-exposed group, (a) children whose mothers were currently more depressed performed better, while (b) children with 2 long alleles erred more than those with > 1 short SLC6A4 allele. Non-pSRI-exposed children with > 1 short allele erred more than those with 2 long alleles, controlling for prenatal and current maternal mood (the reverse of pSRI-exposed children). Prenatal maternal depression was associated with poorer EFs, regardless of pSRI exposure. Prenatal SRI exposure was associated with better EFs if and only if the mother was currently depressed or the child had 2 short SLC6A4 alleles. Better cognitive control in those with reduced 5HTT expression (s allele) and prenatal SRI exposure may reflect an increased sensitivity to early serotoninergic programming.

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ENDOCRINE PARAMETERS WERE MEASURED THROUGHOUT THE EXPERIMENT. EACH STATUS MEASURE, OBJECTIVE versus SUBJECTIVE PREDICTED A UNIQUE CONSTELLATION OF PHYSIOLOGICAL REACTIVITY TO STRESS, PERCEIVED PSYCHOLOGICAL RESOURCES AND CHANGES IN AFFECT. SPECIFICALLY, SES WAS NEGATIVELY CORRELATED WITH VAGAL TONE AND BASELINE NEGATIVE AFFECT; LOW SES PREDICTED GREATER INCREASES IN SYMPATHETIC REACTIVITY TO THE NEGATIVE, MOST STRESSFUL SOCIAL FEEDBACK CONDITION, BUT FASTER RECOVERY. IN CONTRAST, THOSE WITH LOW SSS SHOWED DECREASES IN PARASYMPATHETIC REACTIVITY DURING THE STRESS TASK AND THE LEAST VAGAL REBOUND WHEN IN THE HIGHEST STRESS CONDITION. THIS WAS ALSO RELATED TO GREATLY INCREASED INFLAMMATION. OVERALL, IN THESE DATA, IT APPEARS THAT THE SES MEASURE WAS ASSOCIATED WITH PARASYMPATHETIC ACTIVITY. THE IMPLICATIONS OF USING SUBJECTIVE or OBJECTIVE MEASURES TO ASSESS AUTONOMIC REACTIVITY AND RECOVERY AS WELL AS PSYCHOLOGICAL COPING WITH SOCIAL STRESSORS ARE DISCUSSED.

INCREASED OPPORTUNITIES TO INTERACT WITH THE MOTHER AFFECT RESPONSES OF PIGLETS TO MEANING AND A CHANGE OF ENVIRONMENT

M. Oostindjer, H. van den Brand, B. Kemp, and J. E. Bolhuis

Adaptation Physiology Group, Wageningen University, Wageningen, The Netherlands

marj.el.oostindjer@wur.nl

We investigated effects of increased opportunities to interact with the mother on the ability of piglets to cope with weaning stress and a change in environment from barren to enriched or vice versa. Piglets were housed in barren or enriched pens with their mother confined in a farrowing crate or loose-housed preweaning. Enrichment consisted of increased space allowance, straw, wood shavings, peat and branches. Piglets were weaned at day 29 and relocated to a barren or enriched pen (2 × 2 factorial arrangement, eight treatments, eight pens per treatment, four pigs per pen). Behavior was recorded on day 1, 5, 9 and 12 postweaning. Weaning piglets from loose-housed sows showed less damaging behaviors directed at pen mates than piglets from confined sows (belly nosing: 0.3 versus 0.7%, p = 0.04; other oral manipulative behaviors: 0.8 versus 0.9% of observations, p = 0.05) and more play behavior (0.9 versus 0.7%, p = 0.02). Piglets from a confined sow switching from a barren to enriched environment showed the highest levels of play behavior (1.8%) and lowest levels of belly nosing (0.03%) while piglets from a confined sow switching from an enriched to a barren environment showed lowest levels of belly nosing (1.6%, p = 0.09) and low levels of play (0.1%, p = 0.04). Having more opportunities to interact with the mother before weaning seems to buffer the detrimental effects of weaning and of changing from an enriched to barren environment in piglets. It also increased the positive response to obtaining environmental enrichment, suggesting the mother positively affects stress-resilience or emotional state.

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