LONG-TERM EFFECTS OF BRIEF AND REPEATED PERIODS OF BRIEF SOCIAL ISOLATION STRESS DURING EARLY ADOLESCENCE

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Introduction: Social isolation stress (SIS) is one of the most commonly used stress paradigm to reproduce psychiatric-like disorders in rodents. Generally it is conducted for long periods of time from weaning to adulthood. However, the effects induced by repeated brief periods of SIS during early adolescence only, a critical phase for brain development, are less explored. Moreover, literature data suggest that early-life adverse experiences may lead to enhanced vulnerability or resilience for stress-related psychopathologies when individuals are exposed to an additional stress later in life.

Materials and methods: Male Sprague-Dawley rats were subjected to 2h of SIS per day from postnatal day (PND) 28to PND 34. The enduring effects on emotional (elevated plus maze, EPM; open field, OF; acoustic startle response, ASR; marble burying) and cognitive (prepulse inhibition, PPI; Morris water maze, MWM; auditory fear conditioning, AFC) domains were evaluated at adulthood (PND 120-130). Moreover, to evaluate whether rats subjected to brief periods of SIS display at adulthood vulnerability (or resilience) for anxiety-like behaviors (EPM, OF, ASR and marble burying) and cognitive deficits (PPI, MWM, AFC) when exposed to a second stress, single prolonged stress (SPS) was performed at adulthood (PND 90).

Results: Our results demonstrated that brief and repeated periods of SIS from PND 28to PND 34induce an enhanced anxiety-like behavior in the OF, EPM and ASR, but not cognitive impairments in the PPI at adulthood. Moreover, when rats are subjected to SPS at PND 90, SIS induces resilience towards anxious-like phenotype in the OF, EPM and ASR and vulnerability towards cognitive impairments in the PPI at adulthood.

Discussion and conclusions: We found that brief and repeated periods of SIS during early adolescence profoundly affect behavior at adulthood and induce resilience towards anxiety-like behavior and vulnerability towards cognitive impairments at adulthood if rats are exposed to SPS. Additional studies will be performed to clarify the neurobiological mechanisms responsible of the increased vulnerability or resilience towards behavioral alterations.