Female mice with a lower prepulse inhibition present higher effects of an early stress on depressive-like behaviour

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Background:

The PPI is an operational measure of sensory-motor gating that can identify alterations in the mesolimbic dopaminergic system. Maternal separation with early weaning (MSEW) is a reliable animal model of childhood adversity and depressive-like behaviour. The splash test is used to measure aspects of depression, but preclinical studies have been performed mainly on male subjects, despite women presenting a higher prevalence of depression and being more vulnerable to the negative consequences of stress.

Materials and Methods:

Female CD1 mice that underwent MSEW or a standard nest (SN) environment were distributed according to their high or low PPI levels. Afterwards, they were assessed in the splash test, which consisted of spraying a 10% sucrose solution on the dorsal coat of mice.

Female CD1 mice:
- SN (n=21)
(PND 1-21 maternal care)
- MSEW (n=22)
(PND 2-5: MS 4h; PND 6-16: MS 8h; 17 Weaning)

%PPI:
75dB/30ms
75dB/100ms
85dB/30ms
85dB/100ms

Splash Test

The total time of grooming over a 5-minute period was scored.

Results:

#p<0.01 vs. SN Low-PPI females

Conclusions:

SN Low-PPI females presented a higher percentage of total and back grooming than SN High-PPI mice and MSEW Low-PPI females; however, there was no difference in the percentage of leg grooming. In conclusion, Low-PPI female mice showed higher consequences of MSEW on depressive-like behaviour, since MSEW only decreased the time of back grooming in them. Therefore, PPI levels can identify the more vulnerable animals to an early stress.