Effects of antenatal depression on infant hypothalamic-pituitary-adrenal axis over the first year of life

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BACKGROUND

- Antenatal depression, with a prevalence rate of 16% in Ireland[1], is associated with wide-ranging effects on offspring, including adverse effects on infant birth outcomes, development, and mental health in later life[2].
- There is emerging evidence for a foetal programming effect of antenatal depression on the infant hypothalamic-pituitary-adrenal (HPA) axis.
- Higher infant cortisol levels are reported following exposure to antenatal depression *in utero*, increasing the infant's vulnerability to physical and mental illness in later life[3,4].

AIMS

- Investigate the effect of maternal depression during pregnancy on the infant HPA axis over the first 12 months postpartum.
- Examine the effect of maternal factors (age, BMI, gravidity, parity, early life adversity, lifetime history of depression, antidepressant use, cortisol measures, and clinical measures), obstetric factors (delivery method), and infant factors (birth outcomes, infant sex) on the infant HPA axis over the first year of life.

METHODS

Three infant groups were examined in this prospective longitudinal study:

1. Infants of women with Major Depressive Disorder (MDD) during pregnancy (Depressed; n=23)
2. Infants of euthymic pregnant women with a lifetime history of MDD (History; n=33)
3. Infants of healthy pregnant women (Control; n=42)

Maternal salivary cortisol levels were examined during pregnancy and at two, six, and 12 months postpartum.

Infant cortisol stress response to a vaccination stressor were examined at two, six, and 12 months postpartum.

RESULTS

Table 1. Maternal sociodemographic characteristics

	Depressed (n=23)	History (n=34)	Control (n=43)	Statistic, p-value
Age (years) Mean (SD)	31.60 (3.89)	32.44 (5.23)	33.90 (4.72)	F=1.98, p=0.143
BMI (kg/m²) Mean (SD)	24.10 (2.28)	24.81 (4.05)	25.01 (4.19)	F=0.18, p=0.832
Pregnancy Intent				χ^2=12.34, p=0.002**
Planned	12	29	38	
Unplanned	11	4	5	
Relationship status				χ^2=3.40, p=0.493
Single	2	3	3	
Partnership	21	31	43	
Education				χ^2=11.52, p=0.073
High School	5	5	2	
Some College	1	6	5	
Undergraduate and higher	17	22	36	
Employment				χ^2=10.34, p=0.006**
Employed	19	21	40	
Unemployed	4	12	3	

- The majority of mother-infant dyads in this sample were socioeconomically advantaged.
- The Depressed group had a higher proportion of unplanned pregnancies.
- At six months, infants in the Depressed group had higher mean cortisol (p=0.007), post-stressor cortisol (p<0.001), and cortisol reactivity (p=0.004) compared to the History and Control groups, indicating HPA axis hyperactivity.
- There were no significant differences in infant cortisol levels among the groups at 12 months.
- There was no effect of maternal, obstetric, or infant factors on infant cortisol levels.

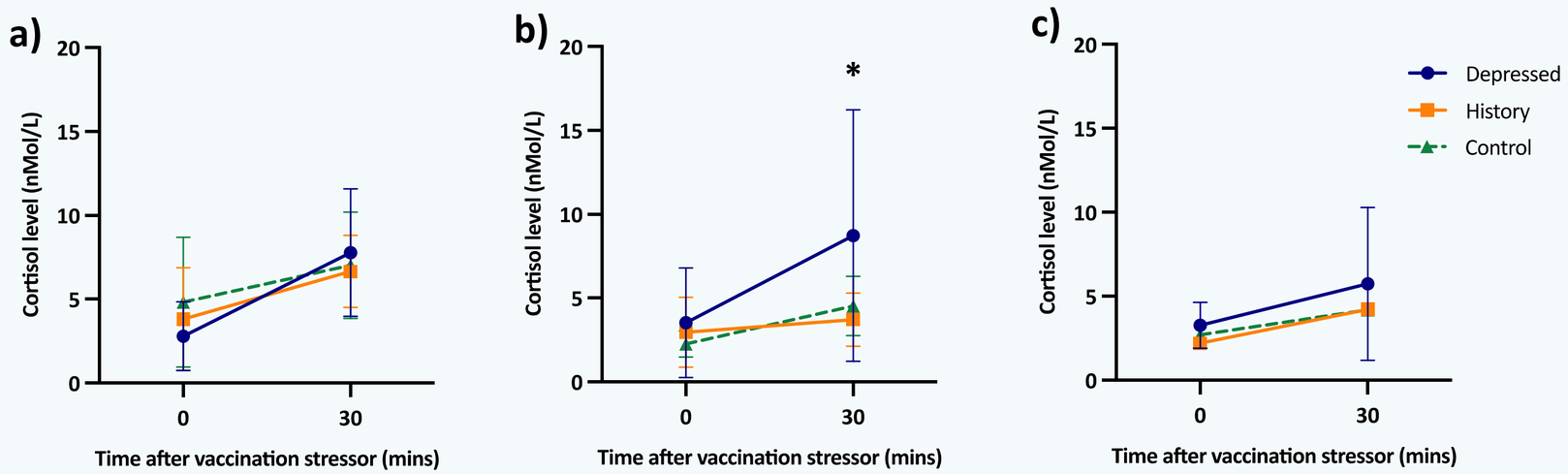

Figure 1. Infant cortisol levels at baseline (0 mins) and 30 mins after vaccination stressor at a) 2 months, b) 6 months, and c) 12 months
*p <0.001

Conclusion

- Maternal antenatal depression is associated with infant HPA axis dysregulation, with higher cortisol stress response at 6 months.
- Normalisation of infant cortisol measures by 12 months in this sample was a reassuring finding and may be due to the stress-buffering effect of the socioeconomically advantaged demographics of this sample.
- These results highlight the importance of early detection and management of perinatal depression for better outcomes in the mother-infant dyad.

References:

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