



Antidepressant Treatment Modifies the Association Between Maternal Breastfeeding Experience and HPA Axis Activation

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Abstract

Objective: Longer breastfeeding duration is associated with lower rates of postpartum depression, but the underlying mechanism is not known. We sought to quantify the association between maternal experience of breastfeeding and HPA axis activity.

Study Design: We analyzed data from the Mood, Mother, and Infant Study. Feeding intention was assessed in the 3rd trimester, and mood symptoms, antidepressant use, and breastfeeding intensity were assessed monthly in the first postpartum year. Breastfeeding experience was assessed using the Maternal Breastfeeding Evaluation Scale (MBSES). Maternal hair was collected at 6 months and analyzed utilizing liquid chromatography-tandem mass spectrometry to assess cortisol and cortisone levels over the prior 3 months. We used T tests, Pearson correlation, and linear regression to quantify associations between hair corticosteroids and antidepressant use, mood symptoms, breastfeeding intensity, and breastfeeding experience.

Results: Hair steroid levels were available for 179 participants, among whom 44 were taking antidepressants at 6 months postpartum. Antidepressant use was associated with higher hair cortisone than non-use (mean (se) 8.68 (0.97) vs. 6.36 (0.33), T test p=0.03), but not with cortisol or cortisol-to-cortisone ratio (p >0.05, Table). Hair cortisone was correlated with weight at the 6 month visit, and inversely correlated with breastfeeding intensity and MBSES, but it was not associated with mood symptoms. In multivariable regression models, we found that antidepressant use modified the association between MBSES and hair cortisone (interaction p=0.02, figure). Among women using antidepressants, a more positive experience of breastfeeding was associated with lower hair cortisone, whereas among women not using antidepressants, breastfeeding experience was not related to hair cortisone levels.

Conclusion: Among women being treated for depression, we found that maternal experience of breastfeeding was inversely correlated with hair cortisone levels. These data suggest that the affective experience moderates the effect of breastfeeding on maternal physiology

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Methods

- We performed a secondary analysis of data from participants in the ongoing cohort study Mood, Mother and Infant (MMI): The psychobiology of impaired dyadic development.
- Women intending to breastfeed were recruited in the 3rd trimester of pregnancy, oversampling for women with current or past depression or anxiety as determined by Structured Clinical Interview.
- Recruitment was stratified by parity to include equal numbers of primiparous and multiparous women.
- Data on medication use, mood symptoms, and infant feeding were collected via monthly telephone interviews
- At 6 months postpartum, participants and their infants attended a lab visit.
- To measure chronic HPA activation over the past 3 months, we collected 20-25 strands of hair. Hair samples were assessed using a commercially available immunoassay with chemiluminescence detection (CLIA, IBL-Hamburg, Germany) that has been validated with liquid chromatography mass spectrometry/MS
- Maternal experience was measured using the Maternal Breastfeeding Evaluation Scale, which uses a 5-point Likert scale.

Factor	Example Statements in Likert Scale
Maternal enjoyment and role attainment	Breastfeeding was a special time with my baby. Breastfeeding made me feel more confident as a mother. Breastfeeding was like a high of sorts.
Infant satisfaction and growth	My baby loved to nurse. While breastfeeding, I worried about my baby gaining enough weight ^R . My baby did not relax while nursing ^R .
Lifestyle and Body Image	Breastfeeding made me feel like a cow ^R . Breastfeeding was physically draining ^R . I could easily fit my baby's breastfeeding with my other activities.

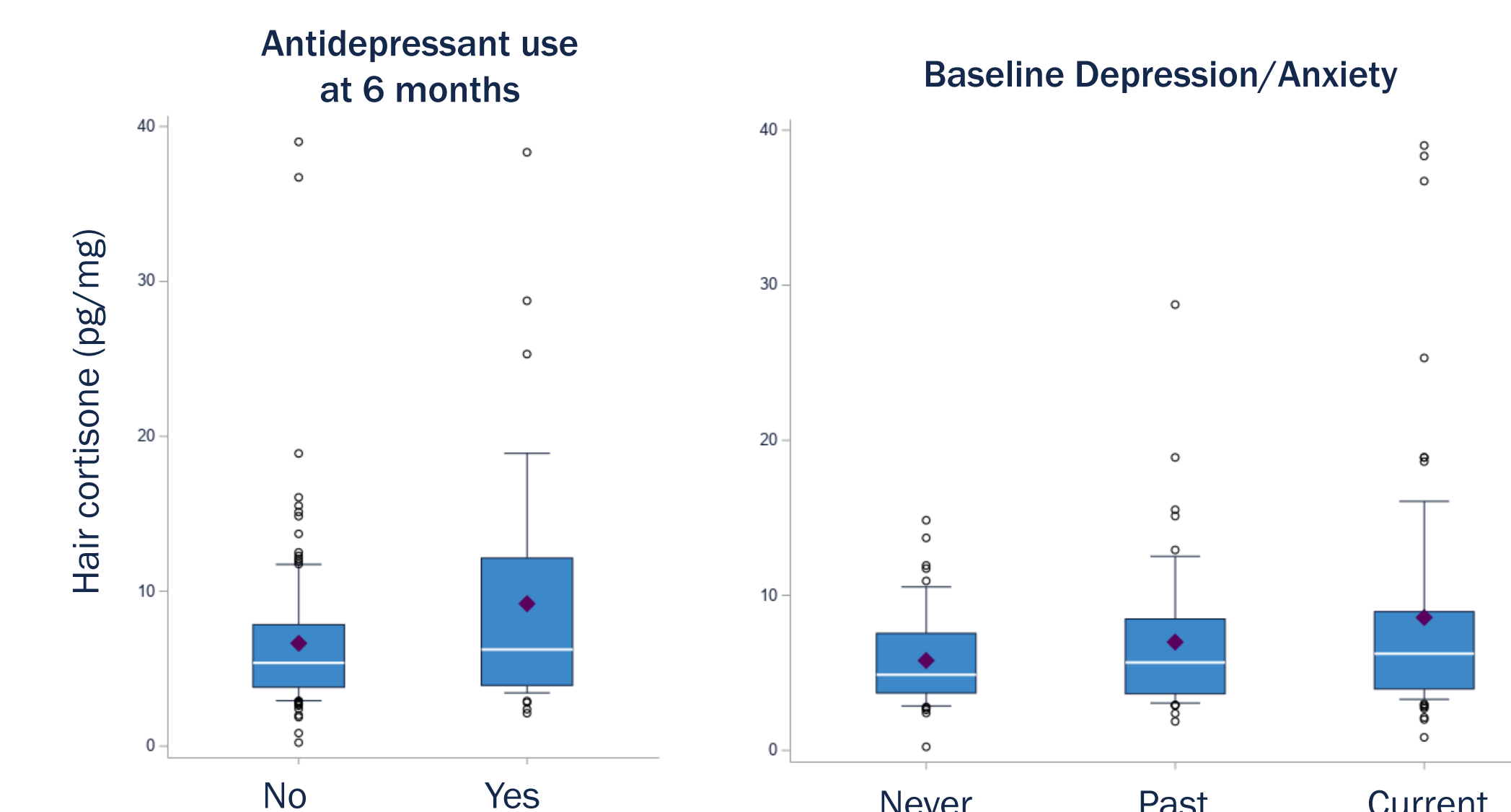
R - reverse coded

- We used T-tests to compare mean levels of hair cortisone, cortisol and cortisol-to-cortisone ratio among patients, stratified by antidepressant use at 6 months and baseline risk status. We calculated Pearson correlation coefficients for hair cortisone and cortisol and infant feeding-related measures, including breastfeeding intensity, indexed by proportion of infant feeds that were mother's milk, and breastfeeding experience.
- We further used linear regression to quantify correlations between hair cortisone and maternal weight at 6 months, breastfeeding intensity, and experience of breastfeeding

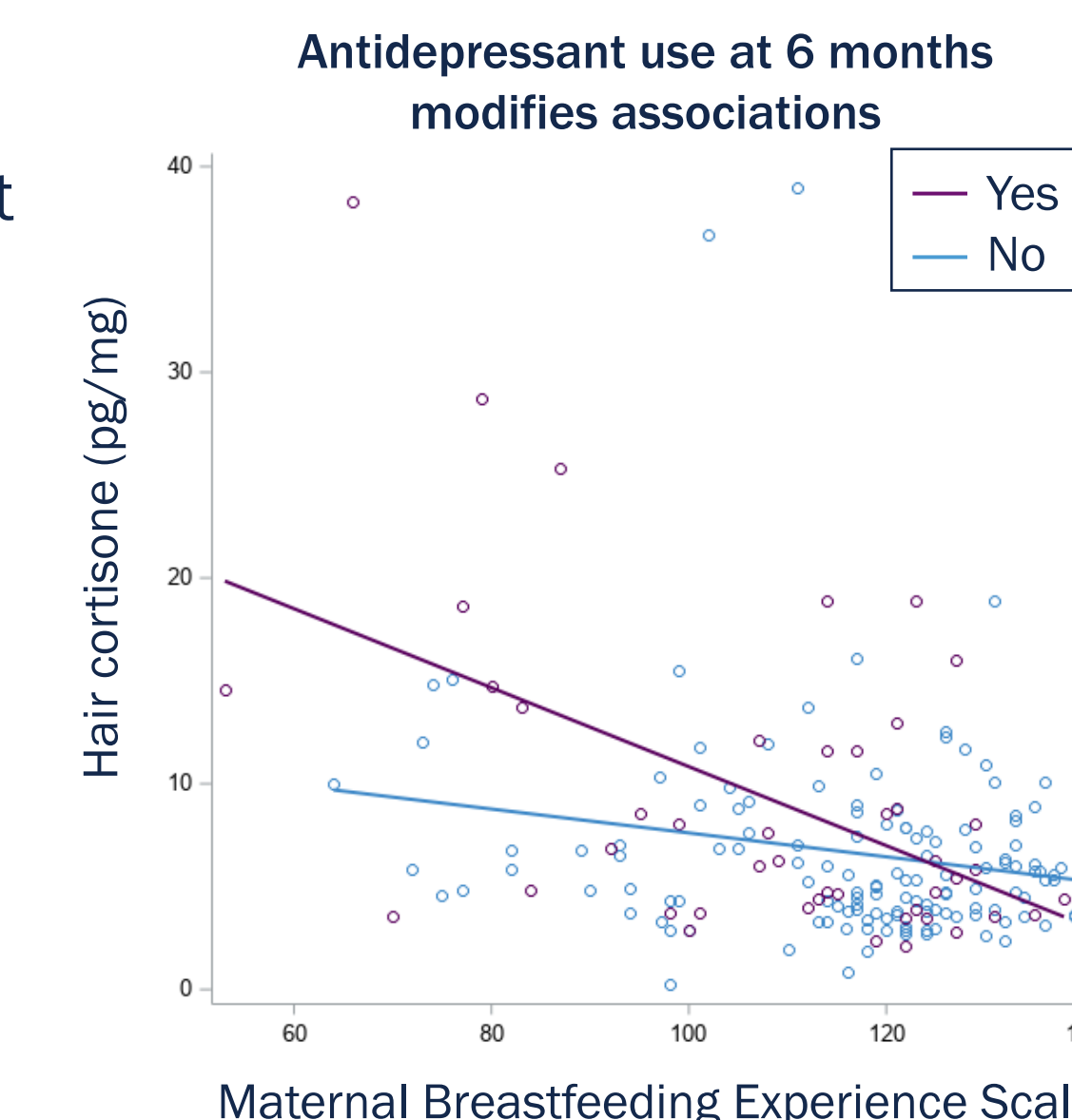
Results

	Total N	N	%	N	%	p
Race/Ethnicity						0.14
White	138	98	72.1	40	88.9	
Black or African-American	12	10	7.4	2	4.4	
Hispanic	13	12	8.8	1	2.2	
Other/Mixed	18	16	11.8	2	4.4	
Marital Status						0.11
Married	147	106	77.9	41	91.1	
Living with partner	18	15	11.0	3	6.7	
Not living with partner	16	15	11.0	1	2.2	
Education						0.006
< 4yr college graduate	42	37	27.2	5	11.1	
Graduated 4yr college	55	45	33.1	10	22.2	
Post-graduate	84	54	39.7	30	66.7	
Employed during pregnancy						0.75
No	49	36	26.5	13	28.9	
Yes	132	100	73.5	32	71.1	
Household Income						0.07
Less than \$30,000	33	30	22.4	3	6.7	
\$30,000-59,999	34	26	19.4	8	17.8	
\$60,000-79,000	40	31	23.1	9	20.0	
\$80,000-99,000	26	18	13.4	8	17.8	
\$100,000 or above	46	29	21.6	17	37.8	
Insurance						0.19
None(self-pay)	4	4	2.9	0	0.0	
Government (Medicare/Medicaid)	41	35	25.7	6	13.3	
TRICARE	4	3	2.2	1	2.2	
Private	132	94	69.1	38	84.4	
Parity						0.78
0	80	62	45.6	18	40.0	
1	73	54	39.7	19	42.2	
2 or more	28	20	14.7	8	17.8	
Mode of delivery						0.77
Spontaneous Vaginal Birth	141	106	77.9	35	77.8	
Operative Vaginal Birth	7	6	4.4	1	2.2	
Cesarean Birth	33	24	17.6	9	20.0	
High infant feeding intention						0.21
No	82	58	42.6	24	53.3	
Yes	99	78	57.4	21	46.7	
High Risk						<0.001
No	56	55	40.4	1	2.2	
Yes	125	81	59.6	44	97.8	

Results



Current antidepressant use and current or past depression or anxiety were associated with higher hair cortisone levels. Among women with antidepressant current use, more positive breastfeeding experience were associated with lower hair cortisone levels (p for interaction=.01).



Conclusions

- Among women being treated with antidepressants, quality of breastfeeding experience is inversely associated with hair cortisone levels
- These results suggest that affective experience of breastfeeding moderates effects on maternal physiology

