Neonatal Behaviour and Stress Response in Postpartum Psychosis

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abstract

Background: This study aimed to investigate the behaviour and cortisol reactivity of neonates born to women at risk of postpartum psychosis who became unwell in the first 4-weeks post delivery (AR-PS), compared to neonates of women at risk who stayed well (AR-NPS) and those born to healthy women (HC).

Methods: Neonatal behaviour was assessed using the Neonatal Behavioral Assessment Scale (NBAS), performed on 88 infants (AR-PS = 12, AR-NPS = 25 and HC = 51). Neonates' cortisol levels were measured pre-, immediately post- and 30-minutes post-NBAS.

Results: There were no significant differences between the groups in the orientation, range of state, regulation of state, motor or autonomic stability scores.

There was a significant group effect on delta cortisol from pre- to immediately post-NBAS ($F_{(2,73)}$=4.0,p=.02) and from pre- to 30-minutes post-NBAS ($F_{(2, 61)}$= 3.3, p=.04), with AP-PS neonates having a greater increase in cortisol levels from pre- to immediately post-NBAS ($t_{(73)}$=2.7,p=.01) and from pre- to 30-minutes post-NBAS ($t_{(61)}$=2.4,p=.02), compared to AR-NPS neonates. There was a trend towards a significant group difference in delta cortisol from immediately post- to 30-minutes post-NBAS ($H_{(2)}$=5.9,p=.053)

Conclusion: Neonates born to women at risk of postpartum psychosis who became unwell found the NBAS more stressful and took longer to recover than neonates born to women at risk who stayed well and those born to healthy women.

background

Postpartum psychosis is the most severe postnatal psychiatric disorder, typically occurring within the first few weeks following delivery. Symptoms typically develop rapidly and include mood lability, hallucinations, delusions, confusion and loss of insight.

There is evidence that maternal postnatal mood disorders can have a negative impact on offspring outcomes, including behaviour and HPA axis function.

However, no study has investigated the behaviour and stress response in neonates born to women at risk of postpartum psychosis.

This study aimed to investigate the behaviour and cortisol reactivity of neonates born to women at risk of postpartum psychosis who became unwell in the first 4-weeks post delivery (AR-PS), compared to neonates of women at risk who stayed well (AR-NPS) and those born to healthy women (HC).

methods

Sample: 88 neonates were assessed on average 10 days after delivery (range: 5-40 days, median 8 days): 12 born to women at risk of postpartum psychosis who had an affective or psychotic episode in the first 4-weeks post delivery (AR-PS), 25 born to women at risk of postpartum psychosis who remained well post delivery (AR-NPS) and 51 born to healthy women (HC).

Infant outcome: The Neonatal Behavioral Assessment Scale (NBAS) was used to assess neonatal behaviour, including orientation, range of state, regulation of state, motor and autonomic stability.

During the NBAS the examiner undresses and handles the baby and thus the assessment can be seen as a mild stressor. Neonates' cortisol levels were measured pre-, immediately post- and 30-minutes post-NBAS to assess their stress reactivity.

results

Using the Kruskal Wallis test there were no significant differences between the 3 groups in orientation, range of state, regulation of state, motor or autonomic stability scores. See Table 1.

Table 1: Infant behaviour on the NBAS in the infants of the HC, AR-NPS and AR-PS groups.

	HC (n = 51)	AR-NPS (n = 25)	AR-PS (n = 12)	Statistical test & significance
Orientation, Mdn (IQR)				
	7.3 (6.4 - 7.9)	7.0 (5.6 - 7.7)	6.6 (6.1 - 7.3)	$H_{(2)}$ = 1.8, p = .41
Range of State, Mdn (IQR)				
	4.0 (3.5 - 4.3)	3.5 (2.7 - 4.1)	4.0 (3.5 - 4.3)	$H_{(2)}$ = 3.6, p = .16
Regulation of State, Mdn (IQR)				
	5.7 (5.0 - 6.5)	6.0 (5.0 - 6.6)	5.7 (5.1 - 6.2)	$H_{(2)}$ = 0.7, p = .71
Motor, Mdn (IQR)				
	5.2 (4.8 - 5.8)	5.0 (4.5 - 5.6)	5.2 (4.3 - 6.0)	$H_{(2)}$ = 1.6, p = .48
Autonomic Stability, Mdn (IQR)				
	5.7 (4.7 - 7.0)	5.3 (4.7 - 6.8)	4.8 (3.6 - 6.3)	$H_{(2)}$ = 3.0, p = .22

ANOVA showed a significant effect of group on delta cortisol from pre- to immediately post-NBAS ($F_{(2, 73)}$ = 4.0, p = .02). Neonates of women in the AR-PS group had a greater increase in cortisol levels from pre- to immediately post-NBAS than neonates in the AR-NPS group ($t_{(73)}$ = 2.7, p = .01).

Using ANOVA there was also a significant effect of group on delta cortisol from pre- to 30-minutes post-NBAS ($F_{(2, 61)}$ = 3.3, p = .04). Again, the neonates born to women in the AR-PS group showed a steeper increase in cortisol levels from pre- to 30-minutes post-NBAS than those born to women in the AR-NPS group ($t_{(73)}$ = 2.7, p = .01).

Finally, the Kruskal Wallis test showed a trend towards a significant group difference in delta cortisol from immediately post- to 30-minutes post-NBAS ($H_{(2)}$ = 5.9, p = .053), with neonates of women in the AR-NPS showing a greater decrease in cortisol levels between the two time points, compared with the neonates of AR-PS and HC groups. See Table 2 and Figure 1.

Table 2: Neonatal cortisol response to NBAS in the HC, AR-NPS and AR-PS groups.

	HC (n = 42)	AR-NPS (n = 24)	AR-PS (n = 10)	Statistical test & significance
Delta cortisol Pre to Post NBAS (nmol/L), M (SD)				
	0.02 (7.7)	-0.6 (9.8)	7.7 (6.8)	$F_{(2, 73)}$ = 4.0, p = .02
Delta cortisol Pre to 30-mins Post NBAS (nmol/L), M (SD)[a]				
	0.9 (9.5)	-3.8 (8.7)	4.3 (4.0)	$F_{(2, 61)}$ = 3.3, p = .04
Delta cortisol Post to 30-mins Post NBAS (nmol/L), M (SD)[b]				
	-0.1 (6.1)	-3.8 (5.1)	-2.3 (7.1)	$H_{(2)}$ = 5.9, p = .053

[a] n=64 (HC=34; AR-NPS=20; AR-PS=10); [b] n=66 (HC=37; AR-NPS=20; AR-PS=9).

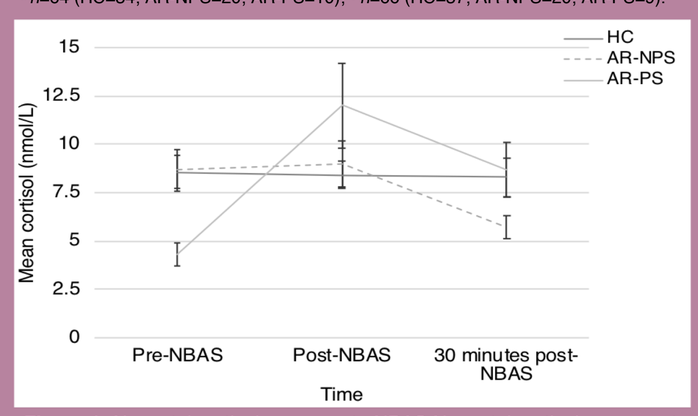

Figure 1: Neonatal cortisol response to NBAS Neonatal cortisol response to NBAS in the HC, AR-NPS and AR-PS groups.

conclusion

These preliminary findings show that neonates born to women at risk of postpartum psychosis, regardless of whether they develop symptoms following delivery, have similar patterns of behaviour at birth as neonates born to healthy women. Contrary to the literature on other postpartum disorders, this finding suggests that the presence of maternal symptoms in the immediate postpartum does not negatively impact on early behaviour in the neonates of women at risk of postpartum psychosis.

On the other hand, in line with the literature on other postpartum mood disorders, neonates born to women at risk of postpartum psychosis who become unwell, find the NBAS more stressful and take longer to recover than both the neonates born to women at risk who stayed well and those born to healthy women. These findings suggest that, even at a few days old, maternal postpartum symptoms do appear to disrupt the stress response of neonates whose mothers are at risk of postpartum psychosis.

References
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