



## Post-Partum Depression and Infant Crying Behaviour

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### **Topic**

*Crying behaviour*

### **Introduction**

Excessive infant crying can be troublesome for parents and health-care providers, even though for the most part, it is quite benign for the infant.<sup>1</sup> However, in the context of post-partum depression (PPD), excessive crying behaviour may be problematic if it leads to a failure to elicit appropriate maternal responses. This may have substantial and lasting adverse consequences for development. Understanding the impact of infant crying in this setting and the implications for interventions that promote healthy child development services will be the focus of this article.

### **Subject**

Understanding infant social and emotional development in the context of maternal mental illness is a timely and urgent issue. Post-partum depression is common, affecting 10 to 20% of all mothers in the first few post-partum months.<sup>2,3</sup> Accumulating evidence shows that maternal depression adversely influences some aspects of infant development and behaviour,<sup>4,5</sup> particularly difficulty soothing, irritability (i.e. altered behavioural state regulation) and crying behaviour.<sup>6</sup> Arguably, excessive infant crying is a signal waiting for a response. Consequently, it may be a useful target to use for interventions in mothers with depression that improves outcomes for infants and their mothers.

### **Problems**

There are several reasons to believe that targeting infant crying behaviour may be an effective way to improve developmental outcomes among infants of depressed mothers:

- It may be a “red flag” indicating developmental risk.
- PPD may interfere with the infant’s ability to “use” the cry signal as a way to engage or communicate with its depressed mother, thereby compromising social and emotional development.
- Little research has been done to examine how crying characteristics of infants of depressed mothers are interpreted or understood by their mothers or how they are related to developmental outcomes.

- While reported interventions for PPD have typically improved maternal mood, few interventions have been successful in effecting sustained improvement of child developmental outcomes.<sup>7</sup>

### **Research Context**

Infant crying duration and intensity reaches its peak during the first three months of life. All healthy low-risk infants will cry for prolonged periods for no apparent reason that is typically not associated with an identified etiology or pathology, although about 20% do this so much that they are sometimes considered to have “colic.”

Further, under these circumstances infant crying is a key signal that engages mothers and therefore may assist in the emerging social and emotional development of the infant. This three-month period also corresponds with the peak incidence of post-partum depression. What does this mean for the developing infant when the cry signal is ignored, or misinterpreted by the depressed mother?

Post-partum depression poses substantial adverse consequences for mothers and their infants via multiple direct biological (i.e. medication exposure, maternal genetic factors) and environmental (i.e. life with a depressed mother) mechanisms.<sup>8,9</sup> From the earliest newborn period, infants are very sensitive to the emotional states of their mothers and other caregivers.<sup>10,11</sup> Maternal mood and behaviour appear to compromise infant social, emotional and cognitive functioning.<sup>11,12,13,14,15</sup> As children grow, the impact of maternal mental illness appears as cognitive compromise, insecure attachment and behavioural difficulties during the preschool and school periods.<sup>5,16,17,18,19</sup>

Timely and appropriate maternal sensitivity to the infant’s behaviour is a central component of mother-infant relationships and healthy social and emotional development.<sup>20,21</sup> Maternal depression may disrupt the maternal-child relationship,<sup>7</sup> contribute to maternal failure to respond appropriately to infant signals<sup>22</sup> and lead to insecure attachments.<sup>23</sup> A mother’s failure to respond to the crying infant can have important immediate and lasting consequences for infant development.

Maternal insensitivity and emotional unavailability influences the infant’s ability to develop a capacity for arousal regulation.<sup>24</sup> Insensitive maternal behaviour results in increased anger, distress and crying – together, these might reflect an infant’s poor arousal regulation.<sup>25</sup> PPD also alters the capacity to regulate the reciprocal interaction between mothers and their infant via two patterns: intrusiveness and withdrawal. Depressed mothers have more negative perceptions of their infants’ behaviour and are less likely to offer stimulation to their infants.<sup>26,27,28</sup> Such lessened stimulation may lead to disrupted learning during non-social learning tasks. Depression appears to lead the mother to ignore or misinterpret the infant cry signal, compounding the damage of maternal depression. In addition, in a single report, infant crying may even exacerbate or trigger maternal depression, thereby increasing developmental risk.<sup>5</sup>

Community-based early intervention programs<sup>7</sup> and population-based maternal screening for PPD<sup>29</sup> have been attempted as ways to improve developmental outcomes. To date

they have yielded inconsistent results.<sup>7</sup> Brief home-based psychotherapeutic interventions appear to improve maternal mood and lead to a short-term improvement in mother-infant interaction. However, it remains unclear whether this leads to a sustained improvement in child development.<sup>30,31,32</sup> Some interventions aimed at improving maternal mood and marital supports have reported an effect on infant behaviour<sup>33</sup> but not on infant emotional development.<sup>7,34</sup>

Understanding maternal failure to respond appropriately may be a key element in developing interventions that promote healthy infant and child development in the presence of post-partum depression. However, little work has been done that describes how well mothers are able to make correct and/or avoid incorrect judgments. Thus, the question remains: Does improving maternal responses to infant crying offer an opportunity to support healthy infant development in this context?

### **Key Research Questions**

Research needs to address the following:

1. What is the evidence that infant crying might be different in the context of post-partum depression?
2. How do depressed mothers respond to their crying infants?
3. Is excessive crying causally linked to post-partum depression?
4. What do we know about maternal perception of infant crying in this setting?
5. What implications do altered maternal sensitivity (associated with depressed mood) to infant crying have for infant and young child development? How does the absence of a meaningful/appropriate maternal response influence infant crying?
6. How can findings from the questions above be used to develop interventions that utilize infant crying behaviour to promote improved maternal-infant interaction and child development in general? Are there services that target crying in infants of depressed mothers that promote maternal sensitivity to crying and lead to improved early childhood social-emotional development in a setting where crying is misperceived?

### **Recent Research Results**

Multiple lines of evidence point to relationships between excessive crying and long-term social and emotional development,<sup>35</sup> as well as the impact of maternal depression. In a single study, Miller and Barr<sup>36</sup> found a relationship between increased infant crying in the first six weeks post-partum and increasing maternal depressive symptoms. While this finding does not suggest a causal relationship between crying and maternal mood, it does highlight the importance of understanding infant crying as a possible reflection of a distressed or stressed mother-infant relationship. However, to date there has been no research reported that examines the use of infant crying in this context as an intervention to promote improved social and emotional development. Data, on the other hand, do suggest that intervention strategies could be developed.

While soothability (i.e. ability to regulate behaviour) may be altered in infants of depressed mothers,<sup>37</sup> and by extension crying behaviour (duration, timing and fundamental frequency), little is known about infant crying in the context of post-partum depression. Even less is known about how to intervene in this setting to promote optimal developmental outcomes. However, in a single study, Milgrom<sup>38</sup> et al compared crying behaviour in infants of depressed and non-depressed mothers at three and six months. From one-week daily recordings, variations in cry patterns were similar between groups and between ages (i.e. crying peaked in the afternoon and early evening and there was a reduction in total crying per week by six months). However, infants of depressed mothers cried significantly more in total per day than infants of non-depressed mothers at three months. Interestingly, depressed mothers did not rate their infants as more difficult, suggesting that crying amount differences could not easily be explained as a function of infant temperament. By six months, maternal depression had lessened and differences between crying groups had disappeared. Milgrom speculates that this change reflected the fact that infants had learned that crying was not a useful comforting strategy, thereby leading to a reduction in this mode of communication.

Convergent evidence from studies examining other aspects of infant behaviour in this setting also suggests that infants of depressed mothers are more likely to cry more. Depressed mothers gaze less at their infants, rock less, are less active and show poorer responsiveness to their infants.<sup>39</sup> Infants may be more drowsy, more distressed and fussy, look less at their mothers and engage in more self-directed activity.<sup>40</sup>

Depression may affect maternal response via altered sensitivity to their infant's signal.<sup>41</sup> Schuetze and Zeskind<sup>41</sup> show that perception of infant crying varies with level of maternal depression: as the level of depression increases, infant crying is perceived as less urgent and sick-sounding (i.e. less aversive and less arousing). Using Signal Detection Theory, Donovan examined to what extent maternal psychosocial factors affect sensitivity to responses to infant cry. Mothers of four- to six-month-olds were asked whether they could detect differences between a standard cry and frequency variations of that cry. Mothers who were more depressed reported perceiving their infant as more difficult and were less sensitive to changes in cry frequency. Importantly, maternal sensitivity was also affected by marital happiness and conflict over work/home happiness. Together, it appears that both the character of infant crying behaviour and maternal perception of crying differ when mothers are depressed.

## Conclusions

Reviewing what is known about infant crying behaviour and post-partum depression raises more questions than it answers. Little is known about the character of crying among infants of depressed mothers. However, preliminary studies suggest that cry frequency is increased and that PPD may reduce the maternal capacity for processing infants' signals (i.e. crying), which interferes with social and emotional development. Infant crying itself may adversely influence maternal mood. Together, these findings may suggest that we might target crying behaviour for interventions that alter both infant behaviour and maternal perception of their infant's behaviour as ways to improve maternal sensitivity and infant developmental outcomes. At this point, it remains unclear

whether excessive infant crying in the presence of post-partum depression is just a “window” onto a disturbed dyadic relationship and a reflection of developmental risk, or a “door” through which we can enter and intervene to improve developmental outcomes and mental health. In this sense infant crying may also be a “signal by proxy” eliciting help for the depressed mother. Developing services that promote and/or target infant cry during the first four to six weeks may offer ways to intervene and improve the depressed mother-infant dyad.

### **Implications**

Infant crying behaviour may be an important step towards addressing maternal mental health and developmental consequences. We need to address a number of unanswered questions. Do the quality and character of the crying behaviour in this setting matter? What is the role of maternal perceptions of crying, the effect of antidepressant medications (via prenatal exposure and breast milk), specific relationships between crying behaviour and developmental outcomes? Finally, how do contextual factors (family, social and economic variables) influence child development in this context?

Second, if crying is a meaningful “target behaviour” for intervention with depressed mothers, we need to know how to identify it, what aspect of its character is meaningful and who should be the target of the intervention: the crying infant or the mother’s processing of the signal (i.e. mother vs. infant). Donovan<sup>37</sup> speculates that an intervention that increases maternal capacity to *attend* (i.e. enhanced ability to recognize relevant or meaningful aspects of their infant’s behaviours) to infant crying would be beneficial. Similarly, a focus on maternal understanding of the causal attributions associated with the cry (i.e. “the baby is not crying to bother you”) might lead to appropriate responses to the infant. Finally, can maternal mood and developmental outcomes be improved by targeting crying duration or improved maternal response?

Ultimately, focusing on infant crying behaviour associated with maternal mental illness should not be disregarded from the context in which child development occurs. Excessive infant crying in this setting may be only a “red flag” of distress, and as such reflects key co-existent elements of the context in which it occurs, such as the role of the father, social and economic factors and the community context.

## REFERENCES

1. St. James-Roberts I, Plewis I. Individual differences, daily fluctuations, and developmental changes in amounts of infant waking, fussing, crying, feeding, and sleeping. *Child Development* 1996;67(5):2527-2540.
2. Chaudron LH. Postpartum depression: What pediatricians need to know. *Pediatrics in Review* 2003;24(5):154-161.
3. Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, Rush AJ, Walters EE, Wang PS, National Comorbidity Survey Replication. The epidemiology of major depressive disorder: Results from the National Comorbidity Survey Replication (NCS-R). *JAMA - Journal of the American Medical Association* 2003;289(23):3095-3105.
4. Murray L, Hipwell A, Hooper R, Stein A, Cooper P. The cognitive development of 5-year-old children of postnatally depressed mothers. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 1996;37(8):927-935.
5. Murray L, Fiori-Cowley A, Hooper R, Cooper P. The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcomes. *Child Development* 1996;67(5):2512-2526.
6. Field T, Healy B, Goldstein S, Perry S, Bendell D, Shanberg S, Zimmerman EA, Kuhn C. Infants of depressed mothers show depressed behaviour even with nondepressed adults. *Child Development* 1988;59(6):1569-1579.
7. Murray L, Cooper PJ, Wilson A, Romaniuk H. Controlled trial of the short- and long-term effect of psychological treatment of post-partum depression 2. Impact on the mother-child relationship and child outcome. *British Journal of Psychiatry* 2003;182:420-427.
8. Field T, Sandberg D, Garcia R, Vegalahr N, Goldstein S, Guy L. Pregnancy problems, postpartum depression, and early mother-infant interactions. *Developmental Psychology* 1985;21(6):1152-1156.
9. Field T, Diego M, Dieter J, Hernandez-Reif M, Schanberg S, Kuhn C, Yando R, Bendell D. Prenatal depression effects on the fetus and the newborn. *Infant Behaviour and Development* 2004;27(2):216-229.
10. Tronick EZ, Gianino AF. The transmission of maternal disturbance to the infant. *New Directions for Child Development* 1986;34:5-11.
11. Weinberg MK, Tronick EZ. The impact of maternal psychiatric illness on infant development. *Journal of Clinical Psychiatry* 1998;59(Suppl 2):53-61.
12. Murray L, Cooper PJ. Postpartum depression and child development. *Psychological Medicine* 1997;27(2):253-260.
13. Cohn JF, Campbell SB, Matias R, Hopkins J. Face-to-face interaction of postpartum depressed and nondepressed mother-infant pairs at 2 months. *Developmental Psychology* 1990;26(1):15-23.
14. Field T, Healy B, Goldstein S, Guthertz M. Behaviour –state matching and synchrony in mother-infant interactions of nondepressed versus depressed dyads. *Developmental Psychology* 1990;26(1):7-14.
15. Cohn JF, Tronick E. Specificity of infants' response to mothers' affective behaviour. *Journal of the American Academy of Child and Adolescent Psychiatry* 1989;28(2):242-248.

16. Murray L. The impact of postnatal depression on infant development. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 1992;33(3):543-561.
17. Lyons-Ruth K, Connell DB, Grunebaum HU, Botein S. Infants at social risk: maternal depression and family support services as mediators of infant development and security of attachment. *Child Development* 1990;61(1):85-98.
18. Teti DM, Messinger DS, Gelfand DM, Isabella R. Maternal depression and the quality of early attachment: an examination of infants, preschoolers, and their mothers. *Developmental Psychology* 1995;31(3):346-376.
19. Crowell JA O'Connor E. Wollmers G, Sprafkin J, Rao U. Mothers' conceptualizations of parent-child relationships: Relation to mother-child interaction and child behaviour problems. *Development and Psychopathology* 1991;3(4):431-444.
20. Leavitt LA. Mothers' sensitivity to infant signals. *Pediatrics* 1998;102(5 Suppl E):1247-1249.
21. Ainsworth MD, Bell SM, Stayton DF. Infant-mother attachment and social development: Socialization as a product of reciprocal responsiveness to signals. In: Richards MP, ed. *The integration of a child into a social world*. New York, NY: Cambridge University Press; 1974:99-135.
22. Bettes BA. Maternal depression and motherese: temporal and intonational features. *Child Development* 1988;59(4):1089-1096.
23. Teti DM, Gelfand DM, Pompa J. Depressed mothers' behavioural competence with their infants: Demographic and psychosocial correlates. *Development and Psychopathology* 1990;2(3):259-270.
24. Tronick EZ. Emotions and emotional communication in infants. *American Psychologist* 1989;44(2):112-119.
25. Field TM. Affective and interactive disturbances in infants. In: Osofsky JD, ed. *Handbook of infant development*. 2<sup>nd</sup> ed. Oxford, England: John Wiley and Sons; 1987:972-1005.
26. Cohn JF, Matias R, Tronick EZ, Connell D, Lyons-Ruth K. Face-to-face interactions of depressed mothers and their infants. *New Directions for Child Development* 1986;34:31-45.
27. Field TM, Morrow C, Adlestein D. Depressed mothers' perceptions of infant behaviour. *Infant Behaviour and Development* 1993;16(1):99-108.
28. Field TM, Estroff DB, Yando R, del Valle C, Malphurs J, Hart S. "Depressed" mothers' perceptions of infant vulnerability are related to later development. *Child Psychiatry and Human Development* 1996;27(1):43-53.
29. McLennan JD, Offord DR. Should postpartum depression be targeted to improve child mental health? *Journal of the American Academy of Child and Adolescent Psychiatry* 2002;41(1):28-35.
30. O'Hara MW, Stuart S, Gorman LL, Wenzel A. Efficacy of interpersonal psychotherapy for postpartum depression. *Archives of General Psychiatry* 2000;57(11):1039-1045.
31. Wickberg B, Hwang CP. Counselling of postnatal depression: A controlled study on a population based Swedish sample. *Journal of Affective Disorders* 1996;39(3):209-216.

32. Chabrol H, Teissedre F, Saint-Jean M, Teisseyre N, Roge B, Mullet E. Prevention and treatment of post-partum depression: a controlled randomized study on women at risk. *Psychological Medicine* 2002;32(6):1039-1047.
33. Teti DM, Gelfand DM. Behavioural competence among mothers of infants in the first year: the mediational role of maternal self-efficacy. *Child Development* 1991;62(5):918-929.
34. Honey KL, Bennett P, Morgan M. A brief psycho-educational group intervention for postnatal depression. *British Journal of Clinical Psychology* 2002;41(Pt 4):405-409.
35. St James-Robert I. Effective services for managing infant crying disorders and their impact on the social and emotional development of young children.. In: Tremblay RE, Barr RG, Peters RDeV, eds. *Encyclopedia on Early Childhood Development* [online]. Montreal, Quebec: Centre of Excellence for Early Childhood Development; 2004:1-6. Available at: <http://www.child-encyclopedia.com/documents/StJames-RobertANGxp.pdf>. Accessed June 16, 2005.
36. Miller AR, Barr RG, Eaton WO. Crying and motor behaviour of six-week-old infants and postpartum maternal mood. *Pediatrics* 1993;92(4):551-558.
37. Donovan WL, Leavitt LA, Walsh RO. Conflict and depression predict maternal sensitivity to infant cries. *Infant Behaviour and Development* 1998;21(3):505-517.
38. Milgrom J, Westley DT, McCloud PI. Do infants of depressed mothers cry more than other infants? *Journal of Paediatrics and Child Health* 1995;31(3):218-221.
39. Field T, Diego MA, Dieter J, Hernandez-Reif M, Schanberg S, Kuhn C, Yando R, Bendell D. Depressed withdrawn and intrusive mothers' effects on their fetuses and neonates. *Infant Behaviour and Development* 2001;24(1):27-39.
40. Cox AD. Maternal depression and impact on children's development. *Archives of Disease in Childhood* 1988;63(1):90-95.
41. Schuetze P, Zeskind PS. Relations between women's depressive symptoms and perceptions of infant distress signals varying in pitch. *Infancy* 2001;2(4):483-499.

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