Crying Behaviour and Its Importance for Psychosocial Development in Children

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Introduction

For generations, parents have experienced the stress and frustration of increased, inconsolable crying in their infants in the first three to five months of life. In its most extreme manifestations, this increased crying has been considered a clinical problem, often referred to as "colic."[1] The most extreme and dangerous consequence for the infant is abuse or neglect, and especially the specific form of abuse referred to as "shaken baby syndrome."[2] Many of the properties of crying are unique to the first few months,[3] and therefore generate their own particular problems. Later in the first year of life, the amount of crying is much reduced. However, more stable individual differences between infants appear. Those infants who tend to be more reactive and to respond negatively (by crying) can be completely normal, but they are often thought of clinically as having a "difficult temperament." If the crying is associated with difficulties feeding and sleeping, they are often thought of in clinical terms as having behavioural regulation problems ("regulatory disorder").[4] While the vast majority of these crying behaviours are not associated with disease or pathology, the meaning of the crying behaviour for the infants' caregivers

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("perceptual set")[5] is usually a determinant of its psychosocial consequences for the infant. Although many questions remain, research findings have changed our understanding of the nature and significance of this early behaviour.

Zeskind[5] has focused on the normal and abnormal acoustic properties of cries, and Stifter[6] has focused on the differences between "colic" and "difficult temperament." In this paper, I will focus on our new understanding of normal infant crying (including colic) in the first few months of life.

Subject

There are six properties of crying that have been shown to be typical of, and probably unique to, the first months of life in otherwise normal infants.[3,7-9]

1. The overall amount of crying per day (fussing, crying and inconsolable crying combined) tends to increase week by week, peaking some time during the second month, and then receding to more stable and lower levels by the fourth or fifth month of age.[9-11] This is sometimes referred to as the "normal crying curve."[12]
2. Many of the crying bouts are unexpected and unpredictable, starting and stopping for no apparent reason, unrelated to feeding or wet diapers, and unrelated to anything that is going on in the environment.
3. These crying bouts are resistant to soothing, or inconsolable.
4. The infant appears to be in pain, even when it is not.
5. The crying bouts are longer at this age than at any other time, lasting 35 to 40 minutes on average, and sometimes lasting one to two hours.
6. The crying tends to cluster in the late afternoon and evening.[7,10,11]

Each of these properties separately, but especially all together, can be remarkably frustrating for any caregiver.

The properties of crying prior to five months are probably more a reflection of the infant's behavioural state than of any purposive signalling that the infant is doing.[13,14] After the first five months, crying becomes more "intentional" in the sense that it is more context-specific, more incorporated with other signalling systems (such as gazing and pointing),[15] and more "reactive" in nature.[12] However, there are a few infants whose high early crying never wanes,[16-18] as well as

those who have lower amounts of crying during the early “peak” period, but cry at levels after five months of age equivalent to those of infants who have “colic” earlier.[19,20] In those infants in whom the amount or the rate of crying is high (“difficult infants”), the crying can be a very negative signal, and very unsatisfying and frustrating to caregivers.[6]

Problem

The clinical significance of crying is largely a function of how the crying behaviour is perceived and responded to by the caregiver. While the meaning of crying can vary on the basis of cultural belief systems, a number of findings are relevant to how crying is generally understood by caregivers. The challenge is to transmit these findings to caregivers in intelligible ways to prevent negative consequences due to crying behaviour.

Research Context

While clinical studies remain important, crying research has moved beyond unidisciplinary studies to embrace findings from developmental psychology, biological and cultural anthropology, psychobiology, and neurobiology (among others), and to include both experimental and naturalistic observational studies in ecologically valid settings to provide a more complete understanding of the nature and function of early crying behaviour.[13,21-23] Furthermore, the parallel study of both the clinical manifestations and the normative properties of early crying has led to a reconceptualization of the significance of early increased “excessive” crying and “colic.” The argument is that early increased crying (including most cases of so-called “colic”) is a manifestation of normal behavioural development rather than indicative of abnormalities (or “something wrong”) in either the infants or their caregivers.[7] There are also a small number of infants who may have abnormal cries or who are also sick or have something wrong. However, the vast majority (over 95%) of infants with increased crying and colic are normal infants with normal behavioural development.

Key Research Questions

The key research questions are directed at the following quandary: if early increased crying in the first few months of life is not indicative of something wrong, how does one account for the primary properties of crying that are so frustrating to parents without invoking abnormal processes? Answers to this question have required the integration of empirical evidence from a number of usually disparate disciplines. The following is a brief summary of an expanding

literature.[7,22,23]

Recent Research Results

Although variable, most clinical definitions of colic incorporate three primary qualitative dimensions:[8] (1) there is an age-dependent crying pattern, such that the overall amount of fussing and crying per day tends to increase from the second week of life, peaks during the second month of life, and then decreases to lower more constant amounts by the fourth or fifth month of life; (2) there are a number of associated behaviours, the most common and notable of which are that some of the bouts of crying are very prolonged and unsoothable, and that the infant looks as if it is in pain (has a "pain facies"); and (3) the crying bouts are "paroxysmal," meaning that they start and stop without warning and with no clear relationship to anything (including caregiver soothing efforts) that goes on in the environment. The most common quantitative definition is "Wessel's rule of 3s," which states that infants can be considered to have colic if they cry or fuss for more than three hours a day for more than three days a week for more than three weeks.[7,24] Critical to understanding early infant crying is that there is (a) a very large variability from infant to infant in the amounts of crying, with about 25% of infants crying more than 3.5 hours/day and 25% crying less than 1.75 hours at the peak,[10,11] and (b) a continuous spectrum of amounts of crying from a little to a lot, with no specific "border" between normal and abnormal (or "colicky") amounts of crying.

A number of lines of interdisciplinary research have contributed to the evidence that the primary properties of early increased crying, including "colic," are manifestations of normal behavioural development. With regard to the "crying curve," some of this evidence is the following:

1. The basic pattern of increased peaking and then decreasing crying has been replicated in almost all Western societies in which it has been studied, with few variations.[9-11, 24-30] Furthermore, there has been little change within societies over the last 30 years, indicating a lack of secular trends.[10,11,31,32]
2. There is a similar pattern and timing of crying in a number of cultures with radically different caretaking styles.[25,33,34] The most well documented is the crying pattern in the !Kung San hunter-gatherers, who are in constant contact with their infants, breastfeed four times an hour, and respond to virtually all frets and whimpers. Although they do everything that should be soothing, the pattern of early increasing and then decreasing crying is strongly present in these infants as well.[33]

3. Similar “distress curves” have been found in all mammalian species in whom it has been looked for, including guinea pigs,[35] rat pups,[36] chimpanzees,[37] and Rhesus macaques,[38] suggesting that this distress pattern is not unique to human infants.
4. In infants born prematurely by about eight weeks, the distress curve is at six weeks corrected age, indicating that this pattern is not due to postnatal experience, but rather a maturational developmental phenomenon.[39]

Furthermore, it is now clear that all kinds of crying (i.e. fussing, crying and inconsolable crying) is prolonged, that this prolongation occurs only in the first few months, and that inconsolable crying is almost unique to the first few months of life.[3,40] The “unpredictability” of the crying, and of the caregiver’s ability or inability to soothe the infant is most likely due to the facts that (1) the infant cry in the first few months is a reflection of the organization of its behavioural states (crying, awake alert, sleeping), rather than an intentional “signal,”[14] (2) that behavioural state changes occur in “steps” rather than due to increases or decreases in arousal[7,41] and (3) infants are resistant to behavioural state change unless they are in a transitional phase in which they are “ready” to change state.[7] Finally, there is now good evidence that the proportion of infants that have evidence of organic disease to explain their crying is less than 5%.[8,42,43] In the absence of other compromise, infants with “colic” have as good an outcome as infants without “colic.”[44]

While the evidence that early increased crying and colic is part of normal infant development is reasonably compelling, it remains a challenge to understand why it is normal behaviour, given its ability to frustrate caregivers. This has resulted in interesting work on the positive (or “survival”) value of early increased crying in terms of the evolutionary history of humans, and possibly other species. This includes evidence for its role in ensuring sufficient nutrition, closeness to primary caregivers as protection against predators, and the early formation of attachment relationships.[22,45,46] As with most evolutionarily influenced behaviours, whether a particular behaviour functions to provide positive or negative outcomes for an individual depends on the context in which it is expressed. Increasing isolation due to short maternity leaves, nuclear rather than extended families, and separated living arrangements increases the stress on mothers.

Conclusions

In the last 30 years, the accumulation of new interdisciplinary evidence about the properties, time course, and outcome of early crying, including the clinical manifestations of “colic,” has changed our understanding of this increased crying from a behaviour that was considered

abnormal or indicative of disease or dysfunction in the infant, its parents, or both to a behaviour that is part and parcel of normal human infant development. This also implies that the socio-emotional consequences of this crying are largely a function of how caregivers interpret and respond to the crying. These responses may have longer- term effects both in terms of how they treat the infant, on the one hand, and whether they consider that they are poor parents if they cannot soothe their infant or handle the crying, on the other.[5,6,40,47-54] However, in the absence of other compromises in the infant or its environment, the outcome for infants with early increased crying or colic is good.

Implications

A previously underappreciated consequence of understanding the properties of early crying, that they are a normal part of infant behavioural development in all infants, and the potential they have for frustrating caregivers, whether or not their infants have “colic,” is that these properties of crying can be the trigger for a tragically serious consequence referred to variously as Shaken Baby Syndrome (SBS), abusive head trauma, or inflicted childhood neurotrauma.[2] SBS is a form of non-accidental head injury with or without impact, resulting from violent shaking, that presents with a (probably) unique set of injuries, including acute encephalopathy with subdural hemorrhages, cerebral edema, retinal hemorrhages and fractures. About 25% of clinically diagnosed cases die, and about 80% of survivors have lifelong neurological damage, including blindness, cerebral palsy, learning disabilities and behavioural problems.[55]

New evidence has shown that the age-specific incidence curve of Shaken Baby Syndrome has the same onset and shape as the normal crying curve, while the peak incidence occurs at about 12 weeks of age rather than at six weeks, when crying is at its peak.[32] This apparent “delay” in peak incidence may be because 35 to 50% of diagnosed shaken baby cases have evidence for prior shaking or abuse, implying that the shaking episode that brings them to clinical attention is simply the last in a series of such incidents.[32,56,57]

On the positive side, the increasing appreciation of the crying-Shaken Baby Syndrome relationship has opened the possibility that Shaken Baby Syndrome may be reduced by universal educational programs delivered early to new parents to increase understanding about the normality of crying, its ability to frustrate caregivers, and the fact that shaking in response to crying causes serious brain injury and death.[58] To this end, the National Center on Shaken Baby Syndrome has created intervention booklets and DVD/videos designed to encourage the widest

distribution possible to health-care facilities and the general public, called ***The Period of PURPLE Crying.***™ Each letter in the word PURPLE refers to one of the six properties of normal crying that are typical in the first few months of life (**P** for crying peak; **U** for the unexpected timing of prolonged crying bouts; **R** for resistance to soothing; **P** for a pain-like face even when they are not in pain; **L** for long crying bouts, and **E** for evening clustering of crying). Caregivers are encouraged to take three action steps to reduce the likelihood of shaking their infants: (1) increase their contact, carry, walk and talk responses that will help reduce crying, although not stop it altogether; (2) if the crying becomes too frustrating, it's OK to walk away, put their baby in a crib for a few minutes, and calm themselves; and (3) never shake or hurt their baby. In short, the intervention takes advantage of new knowledge about early infant crying, and applies it in the service of reducing the incidence of a catastrophic but preventable outcome. Randomized controlled trials of the efficacy of such interventions in changing knowledge, attitudes and behaviour of new parents are currently in progress, in anticipation of the possible incorporation of such materials in prevention programs across the country if they are demonstrated to be useful.

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