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Co-Sleeping, Breastfeeding and Sudden Infant Death syndrome

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Introduction

Cultural innovations and child care practices and, importantly, the dynamic social values and ideologies that legitimize them, shift quite rapidly relative to evolutionary-based changes in fundamental infant biology.[1] This raises the possibility that widely recommended infant care practices can be at odds with the human infant's biological, psychological and emotional needs and expectations, at least as inferred from the human infant's evolutionary past. This mismatch between human infant biological needs and contemporary caregiving practices or contexts may be particularly heightened in western industrialized cultures within which sudden infant death syndrome (SIDS) and/or sudden unexpected infant death in infancy (SUID) are both more salient and prevalent.[1,2]

Certainly infants sleeping separated from their caregivers at night (solitary room sleeping), infants sleeping on their stomachs (prone) to promote uninterrupted, early consolidation of adult-like sleep, and bottle-feeding with formula or cows milk rather than breast milk were all novel, culturally-sanctioned but scientifically-untested (as safe or best) infant care innovations.[1] It is

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now known that each of these practices has contributed to or led to thousands of SIDS deaths.[3-5] Many of these infant lives, we can infer, could have been saved had we more carefully examined and come to understand the biological validity of mother-infant safe co-sleeping, breastfeeding and infants sleeping on their backs (supine). This adaptive complex altogether maximized the protection of perhaps the most vulnerable primate of all, the human infant, born the least neurologically mature primate, the slowest developing and the most reliant on the mother's body for regulation and support.[1,6-8]

We describe here how the western dismantling of three fundamental evolved maternal nighttime infant caregiving practices, specifically, how to lay your baby down to sleep, how to feed your baby, and where to locate your baby for sleep, created the conditions that favored and fostered the emergence within western industrialized cultures of SIDS. We also discuss how the same underlying cultural beliefs that supported the idea that infants sleep best alone serve presently to permit the acceptance of an inappropriate set of assumptions related to explaining why some babies die unexpectedly while sleeping in their parents beds.[9] These assumptions are that regardless of circumstances, including maternal motivations and/or the absence of all known bedsharing risk factors, even nonsmoking, sober, breastfeeding mothers place their infants at significantly increased risk for SUID by bedsharing.

Subject

Sudden infant death syndrome (SIDS) is a medical syndrome first defined in 1963 and generally described as a "diagnosis by exclusion."[10] There is no animal model of SIDS and it has never been observed to occur naturally in any species other than humans.[2] While the standardization of a SIDS diagnosis has been and continues to be elusive and/or inconsistent, it is most often applied to situations in which an otherwise healthy infant between the ages of 8-16 weeks, especially, but up to 12 months, dies suddenly and unexpectedly presumably during its sleep and upon postmortem examination no apparent internal causal factor(s) explaining the death can be identified.[11,12]

While the general consensus is that there is no single, primary cause of SIDS, its expression depends on, as Kinney and Thach[13] describe it, the simultaneous presence of three factors: 1) some underlying infant vulnerability, likely congenital in origin; 2) some undefined, possibly species-specific characteristic unique to the human infant, especially relevant within a narrow developmental, critical period and, finally; 3) some kind of exogenous stressor. This last factor

could be something stressful or deleterious to which the baby is exposed, or, possibly, something that is missing in the infant's "expected" micro-environment such as mother's breast milk, the delivery of breast milk and/or mother herself and the sensory experiences her presence offers her infant. Altogether this perspective comprises a model for SIDS research known as the "Triple-Risk-Model" proposed in 1994 by Filiano and Kinney[14] but also similarly conceptualized by McKenna.[2]

The congenital or developmental defects implicit to the "Triple-Risk Model" likely express themselves in a myriad of ways. One predominant theory proposes that many SIDS victims exhibit abnormalities in regions of the brain that control breathing and arousals during sleep. Specifically, intensive postmortem neurological studies of their brain tissues reveal a relatively low density of acetylcholine (a neurotransmitter) nerve sites, which, at normal densities, function in critical ways to help re-initiate breathing following a sleep-related apnea or extended breathing pauses. These infants would be classified as having had an "arousal deficiency" before their deaths.[15-17]

Up until the last two decades, research into causes and correlates of SIDS bore little fruit in terms of elucidating preventative measures. However, the most substantial breakthrough in preventing SIDS and/or SUID (to date), perhaps surprisingly, came from adjustment of infant care behaviours. Specifically, modification of common parenting practices involving three of the most fundamental aspects of infant sleep: infant sleep position, feeding method, and where and with whom the infant sleeps (i.e. in a room by himself or in the close proximity of a committed caregiver) has led to significant reductions in the SIDS rates in many European and North American populations.[18,19]

The first indication that infant care practices could promote or reduce infant deaths came in the 1990s when it was discovered that merely placing an infant in the prone rather than supine position tripled an infant's chances of dying.[20] Insights from epidemiological studies from England and New Zealand led to national and international "back to sleep" campaigns in almost all western industrialized countries. Prior to this discovery, in most western industrialized countries SIDS rates ranged between approximately 1.5 to 4 infants per 1000 live births (compared to industrialized counties in Asia, such as Japan, which has the lowest SIDS rates in the world, .05 infants per 1000 live births[21]) with enormous increases amongst minorities, especially impoverished indigenous peoples such as the Maori of New Zealand, the Cree of Northern Canada, and the Aborigines of Australia.[19,22,23] Native peoples in the United States

demonstrated similar exponentially increased SIDS (or SUDI rates, see below), as much as two to seven the times the rates found amongst white Americans.[13,19] Despite significant declines among almost all cultural and/or ethnic groups, SIDS rates still remain the leading cause of death for infants between one month and one year of life in the United States and elsewhere.[13]

Problem

In the last two decades, efforts have been made to differentiate SIDS deaths from the different, but related, larger class of infant deaths referred to as SUID. This broader umbrella term includes, in addition to SIDS (which account for about 80% of SUID cases) other unexpected deaths of an infant due to either "natural causes" or unnatural causes.[13] The former includes infant deaths resulting from mild infection or toxic response, genetic mutations, and/or inherited disorders such as fatty-acid oxidation. The latter includes homicides, as well as intentional suffocation, estimated at about 5% of SUID deaths, but also suspected or definite accidental suffocations, because of an overlay by another person, or an asphyxial wedging or strangulation, especially where the infant is not found dead in a crib but having been on a structure not specifically designed with infant sleep safety in mind (recliners, waterbeds, couches, sofas and/or adult beds).[9]

These definitional distinctions between SIDS and SUID are significant because they represent an increasing effort to standardize what is and is not considered a true SIDS death and what criteria one uses to arrive at a SIDS diagnosis. A large part of this shift is aimed at trying to separate a true SIDS from a preventable asphyxial death, as, for the most part, it is impossible to distinguish between intentional or non-intentional smotherings upon a SIDS autopsy.[24] Hence, with greater frequency, diagnostic judgments are being made based on deaths scene characteristics and descriptions of the infant's sleep environment.[25]

Indeed, if a baby dies in what is defined as an "unsafe sleep environment," such as all non-crib sleeping deaths, those babies are no longer regarded as SIDS deaths, when in fact, they could be.[9] More problematic is the fact that the SUID diagnosis is being applied abundantly in cases where an infant is found dead sleeping next to a parent on the same surface, no matter what the social or physical circumstances.[26]

Subsequently, by virtue of defining that an adult and infant are unable to safely sleep on the same surface together, such as what occurs during bedsharing, even when all known adverse

bedsharing risk factors are absent and safe bedsharing practices involving breastfeeding mothers are followed, an infant that dies while sharing a sleeping surface with his/her mother is labeled a SUID, and not SIDS.[26] In this way the infant death statistics increasingly supplement the idea that bedsharing is inherently and always hazardous and lend credence, artificially, to the belief that under no circumstance can a mother, breastfeeding or not, safely care for, or protect her infant if asleep together in a bed.[27] The legitimacy of such a sweeping inference is highly problematic, we argue, in light of the fact that when careful and complete examination of death scenes, the results revealed that 99% of bedsharing deaths could be explained by the presence of at least one and usually multiple independent risk factors for SIDS such as maternal smoking, prone infant sleep, use of alcohol and/or drugs by the bedsharing adults.[28] Moreover, this new ideology is especially troubling because it leads to condemnations of bedsharing parents that border on charges of being neglectful and/or abusive.

Recent Research

One of the most prominent recommendations that can be made to parents to reduce their infants' risk of SIDS is to practice mother-infant co-sleeping on separate surfaces (the American Academy of Pediatrics[27] calls this "room sharing"). The finding that mother-infant co-sleeping on separate surfaces confers reduced risk of SIDS but some forms of same surface co-sleeping increase risk (under certain circumstances, see below), has given rise to recent public health campaigns against any and all bedsharing in the United States.[29] However, when examined in detail, epidemiological studies reveal inconsistent findings as to whether or not, to what degree, or under what circumstances bedsharing represents a consistent risk factor for SIDS and/or SUID. Studies are plagued by inconsistent definitions of bedsharing (e.g., categorizing deaths on sofas or recliners as bedsharing deaths) and details of the circumstances within which infants die, leading several studies to show heightened risks for infants when sleeping with an adult,[30-32] whereas studies including appropriate covariates have shown modestly elevated[4,33] or no difference[34] in risk for bedsharing infants amongst breastfeeding, non-smoking mothers.

Complicating overly simplistic, reductionist recommendations against bedsharing, is the recent finding that breastfeeding is an independently protective factor against SIDS. Venneman and colleagues[5] recently demonstrated that infants who are formula fed are twice as likely to die of SIDS than breastfed infants based on a case control study of 333 SIDS cases compared to 998 aged matched controls in Germany, from 1998-2001, consistent with previously published reports.[35] While no studies show that co-sleeping in the form of bedsharing, specifically, is

imperative for breastfeeding enhancement, many studies have shown that in order to get more sleep and to ease caring for their infants the decision to breastfeed often leads mothers to adopt routine bedsharing for at least part of the night[36-40] even where they never intended to do so.[41,42] Indeed, nearly 50% of breastfeeding mothers in the United States and Great Britain adopt bedsharing for some part of the night,[38,43-45] and breastfeeding women are twice as likely to sleep with their babies in the first month relative to mothers electing to bottle-feed.[39]

Implications

Given the mutually-reinforcing, positive relationship between mother-infant bedsharing and breastfeeding behaviour (and breastfeeding's role in reducing risk of SIDS), safe bedsharing may actually exert a protective effect against SIDS, although this remains speculative. What is clear is that breastfeeding alone reduces the risk of SIDS and leads many mothers to practice at least occasional bedsharing. The decision to bedshare, in turn, further reinforces and increases breastfeeding in both the short term (feeds per night and total feeding time) and long term (number of months breastfeeding is maintained).[1] In total, this positive bedsharing-breastfeeding connection renders reductionistic and unqualified recommendations against the practice of bedsharing among nonsmoking, non-drug-using mothers especially problematic.[1,29]

Lost in the often contentious debate regarding the safety of bedsharing is the notion that unlike prone, solitary infant sleep or bottle-feeding with formula or cow's milk, mothers sleeping next to their babies and breastfeeding is an evolved suite of behaviors tracing to humans' phylogenetic roots as both primates and mammals.[1] Bottle-feeding and prone infant sleep are both uniquely Western behavioral norms that derived from historically contingent constellations of cultural practices and belief systems.[46] These two behavioral patterns have never had anything to do with promoting species-appropriate mother-infant biology. Consequently, in light of seminal scientific findings and medical recommendations, it was somewhat easy for public health campaigns to reduce the incidence and practice of prone sleep and bottle-feeding.[18] On the contrary, bedsharing (or co-sleeping, more broadly) and breastfeeding (in combination) are embedded in the fundamental, co-regulatory biology and behavioral repertoires of the mother-infant human dyad. They will not be easily eradicated nor should the relationship between mother-infant sleep bedsharing and breastfeeding be summarily and trivially dismissed without thorough scientific evaluation.

Conclusion

It is clear that bedsharing can, indeed, be particularly dangerous and should be avoided when drugs and alcohol are used, when mothers are smokers (before and after pregnancy), when other children are in the bed, if breastfeeding is not involved (as it changes the position of the infant in relationship to the mother's body and the sensitivity of each to the other), or if soft mattresses or heavy blankets are used.[4,34,47-51] It is also clear that co-sleeping on a sofa, a couch or a recliner is highly dangerous and should always be avoided.[48,49,52] For families that cannot arrange a safe bedsharing, however, separate surface co-sleeping (a bassinet next to the bed, or the crib or an attached cradle, a form of roomsharing) provides similar benefits without any risk. At the same time, an informed, breastfeeding mother who makes the conscious decision to practice bedsharing, should be supported in her choice to bedshare and should be given all the safety information that present research has to offer.

Breastfeeding mother-infant dyads are biologically designed (emotionally, socially and physiologically) to sleep next to each other, and the fact that their proximity settles infants, increases sleep for both, and enhances breastfeeding makes this arrangement hard for parents to steadfastly avoid. The fact that this behaviour provides these significant benefits to mothers and infants makes it problematic to recommend, without careful consideration, how or if bedsharing should never be supported, and whether it is prudent to deprive parents of safety information as how to minimize bedsharing risks. In several regards the process by which recommendations against any and all bedsharing are being formulated violates the rules of evidence-based medicine. According to Sackett,[53] public health recommendations that emerge following the rules of evidence-based medicine should be formulated by reference to multiple lines of research evidence that moves beyond the exclusive use of epidemiological findings. Moreover, to be maximally successful public health recommendations must respect and be conscious of the values, ideologies and practical possibilities of those for whom recommendations are intended.[29]

Substantial lines of evidence from studies of human biology and evolutionary anthropology explain the underlying reasons why breastfeeding mothers are inclined to sleep with their infants.[1] In terms of SIDS research and public health campaigns on bedsharing, incorporating an evolutionary, anthropological approach, calling on diverse lines of evidence, to explore the practice of bedsharing and its interaction with breastfeeding and the mother-infant relationship, shifts the starting point from "How to eliminate bedsharing?" to "Why do parents bedshare?" and "How can those practicing bedsharing do it safely?"

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