

Bed sharing and the risk of sudden infant death: parents need clear information

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ABSTRACT

Bed sharing is a major risk factor for sudden infant death syndrome. This risk is increased when the mother smokes or smoked in pregnancy, or when the parent has drunk alcohol or taken drugs. This risk is further increased in younger infants. The mechanism of sudden infant death with bed sharing is unknown, but airway obstruction, thermal stress and head covering have all been suggested. The benefit from bed sharing has only been established for breastfeeding, although other benefits are claimed. There is a small group of infants that has been shown to be at no increased risk of SIDS with bed sharing, namely infants of mothers who do not smoke, who are aged 3 months or more, and whose mothers have not taken alcohol or drugs and do not co-sleep on a sofa. Recommendations on how to bed share safely are not evidence based. Without this knowledge parents cannot make an informed choice on whether or not to bed share. Parents should be advised to place the baby to sleep in its own cot next to the parents' bed for the first six months.

Introduction and historical aspects

The association between bed sharing and sudden infant death has been recognised for thousands of years. Indeed there is reference to it in the Holy Bible: "... this woman's child died in the night; because she overlaid it [1]." Overlaying was the classical belief for the cause of sudden infant death. Until the beginning of the last century it was very common for infants to sleep in the family bed. If the baby died during the night it was natural for everyone to assume that the mother had overlain it [2]. Templeton (1893) described 399 infant deaths in bed with their parents in Dunedin over a 10 year period (1882-1891). The description of these cases was similar to the epidemiological features of sudden infant death syndrome (SIDS). He noted that a disproportionately large number of deaths occurred on Saturday nights, which he attributed to the frequency of alcoholic intoxication on Saturday evenings [cited by Russell-Jones [2]].

The risk of SIDS from bed sharing

The first of the modern epidemiological studies on SIDS examining the association between bed sharing and SIDS was from New Zealand in 1992 [3]. In this nationwide case control study 24.0% of infants died sharing the parental bed compared with 10.5% of controls who bed shared on the reference sleep (odds ratio=2.7; 95% confidence interval=2.0-3.6), and this remained significant after adjustment (OR=2.0; 95% CI=1.4-3.0). We subsequently showed that maternal smoking interacted with infant bed sharing on the risk of SIDS [4]. We concluded that infant bed sharing significantly increased the risk of SIDS, particularly among infants of mothers who smoke. We also showed that the longer the duration of bed sharing

the greater the risk of SIDS [4]. The presence of a dose-response effect supports a causal relationship with SIDS.

Our original findings have been confirmed by others [5-10] and extended (Table 1).

Carpenter and colleagues have shown that infant age interacts with infant bed sharing, such that the youngest infants are at highest risk of SIDS [8]. Furthermore, he showed that in infants not exposed to maternal smoking there was a small but statistically significant increase in risk of SIDS with bed sharing for infants aged less than 3 months [11].

Bed sharing infants who are placed back in their cot are not at increased risk of SIDS [5].

This is important as it suggests the problem relates to bed sharing per se rather than the type of person who bed shares with their infant.

Although most authorities e.g. American Academy of Pediatrics [12], Ministry of Health in New Zealand [13], advise parents to avoid bed sharing with their infant if they have been drinking or taking drugs, the dangers of this combination of behaviours has only recently been convincingly demonstrated [14]. Presumably alcohol and drugs impair the arousal of the adult co-sleeper.

Co-sleeping on a sofa is an important risk factor for SIDS in studies from the UK [14].

However, other studies from US [7], Germany [10] and New Zealand have not supported this observation. Possibly the shape and softness of sofas are different in these countries, which might account for this discrepancy.

Infants sleeping with older siblings are at increased risk of SIDS [4]. There are no data either for or against twins bed sharing (sometimes referred to as co-bedding).

Finally, it needs to be recognised that no bed sharing group has been identified that is associated with a lower risk of SIDS.

Table1. Summary of the risk of SIDS with bed sharing (modified with permission from the New Zealand Medical Journal, 2009 [15]).

- The risk of SIDS with bed sharing is high when the mother smokes or smoked in pregnancy
- The risk of SIDS with bed sharing is higher in younger infants
- There is a small increased risk of SIDS from bed sharing in infants less than 3 months of age whose mothers were non-smokers
- Bed sharing infants who are placed back in their cot are not at increased risk of SIDS
- The longer the infant bed shares during the night the greater the risk of SIDS
- Infants who bed share with mothers who have drunk 2 or more units of alcohol are at risk of death
- Co-sleeping on a couch or sofa is associated with a high risk of SIDS
- Infants bed sharing with older siblings are at increased risk
- There is no evidence that bed sharing is protective against SIDS in any group

The mechanism of SIDS with bed sharing

Several mechanisms have been proposed; these include airway obstruction, thermal stress and head covering. Airway obstruction might be quite subtle. It has been postulated that airway obstruction produced by the jaw being displaced backwards might occlude the upper airways. [16] This is certainly plausible and is more likely than overt “overlying”, which is unlikely except in the rare situation where the parent is so intoxicated that they are unaware that the infant is beneath them. However, thermal stress and head covering are alternative mechanisms proposed. Blackwell et al has postulated that some SIDS deaths are due to uncontrolled inflammatory reaction to infectious agents [17]. Smoking increases the likelihood of bacterial infection. The pro-inflammatory cytokines induced by the infections can cause cardiorespiratory dysfunction, shock and arousal defects [18].

Head covering is associated with a very high risk of SIDS even in infants sleeping alone [19]. In a study of low risk infants 55% of those who bed shared had their head covered with a blanket above the eyes compared with just 2.5% of those sleeping in a cot [20]. 80% of head covering episodes occurred by inadvertent movement of the adult co-sleeper as they changed position during sleep [21].

Thermal stress has been shown to be a risk factor for SIDS, but this is predominantly among infants who sleep prone [22, 23]. Bed-sharing infants are in a significantly warmer environment than solitary sleeping infants (bedding plus being close to an adult) and more likely to become face covered - a potentially significant heat stress. In overnight home studies, bed sharing infants had a significantly higher rectal temperature than infants sleeping alone [24]. Hyperthermia was not seen, but the mechanism is more likely to be associated with thermal stress than hyperthermia per se. Over 50% of normal healthy infants carry *Staphylococcus aureus* in the nasopharynx that are capable of producing pogenic toxins, but

only when the temperature is between 37 and 40°C [18]. The temperature of the solitary sleeping infant is below this but may reach these levels when co-sleeping.

Airway obstruction, thermal stress or head covering might interact with arousal defects, such as can be produced by *in utero* smoke exposure, or by gene polymorphisms.

Postulated benefits of bed sharing

There are many reasons parents give for bed sharing. These include breastfeeding, better parent and infant sleep, convenience, infant monitoring and safety [25].

Bed sharing results in more frequent suckling [26]. It is associated with a longer duration of breastfeeding, but the effect is small. However a causal relationship has not been shown [27]. It is also argued that it improves mother-infant bonding, but there are no studies reporting this relationship. One might speculate that improved bonding from bed sharing should result in less abuse of infants, but the ecological evidence does not support this contention [16].

Communities with high bed sharing rates do not have lower child abuse rates. Parents report they bed share to promote their sleep [28], but again there is no direct evidence to support this contention. Studies examining infant sleep/wake patterns have shown that bed sharing infants have an increased number of awakenings when compared to solitary sleeping infants.

Whether this is beneficial or possibly harmful has not been established.

Knowledge about the association of bed sharing and SIDS

There are many surveys of infant care practices, including bed sharing, and of the factors affecting these behaviours. In the United States routine bed sharing is associated with young maternal age, black or Asian ethnicity, low income, and infants less than 8 weeks of age [29]. Physicians in the US mainly recommend infants sleep in a cot or bassinette but 8% recommend co-sleeping [30].

Parental knowledge about risk factors for SIDS in New Zealand is poor with only 46% of respondents stating that bed sharing is a risk factor for SIDS [31].

A survey from Canada reported that regular or occasional bed sharing was prevalent (72%), even though 89% of respondents agreed that sleeping with baby had some risks. Worryingly 13% of those who had bed shared reported that they had rolled into or partway onto their infant [302]. The authors concluded that health professionals should promote a separate sleeping surface for infants.

Can bed sharing be done safely?

Some authorities have tried to provide guidelines for bed sharing safely, such as the Norwegian SIDS Organisation [33], which advises: “If you choose to bed share, do it safely by:

- making sure the bed is big/wide enough
- the baby has his/her own blanket/duvet
- making sure the baby can't roll out of the bed or get caught between the bed and the wall.

Such advice is not evidence based.

There is a small group that has been shown to be at no increased risk with bed sharing, namely infants of mothers who do not smoke, who are aged 3 months or more, and whose mothers have not taken alcohol or drugs and do not co-sleep on a sofa.

In New Zealand the wahakura safe bed sharing project is a Maori initiative. Wahakura is a woven flax basket in which the baby sleeps and the basket can be taken into the parental bed. It comes with a set of rules or advice covering back sleeping, keeping the face clear, using a firm mattress without pillows, maintaining a smoke free environment and an “every place-every sleep” consistency of sleep environment. Although this project is yet to be evaluated the wahakura is an option alongside the cot, the bassinet and the clip-on for the mother who smokes.

Recommendations

Most authorities recommend: “Place the baby to sleep in its own cot next to the parents’ bed for the first six months.” In some countries there is a recommendation to avoid all bed sharing, although some disagree and advise avoiding bed sharing only if there are other risk factors present such as smoking or alcohol use.

Irrespective of one’s own personal belief, I would argue that parents have the right to know what risks they are exposing their infants to. Without knowledge of the risks parents cannot make an informed choice, although it could be debated whether ordinary parents can really weigh up the cost, that is the risk of the loss of the baby (and associated guilt and the possible break-up of their marriage) against the comfort of not having to get up and put baby back in

the cot. As a minimum health professionals have the responsibility to provide evidence based advice.

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