

Sudden Infant Death Syndrome

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KEY WORDS

Infant death, SIDS

BACKGROUND

Sudden infant death syndrome (SIDS) is defined as the sudden, unexpected death of an infant before 1 year of age that cannot be explained after a thorough case investigation, including a scene investigation, autopsy, and review of the clinical history

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(Willinger, James, & Catz, 1991). In the United States, about 2,100 infants die of SIDS each year (Mathews & MacDorman, 2013). Risk factors for SIDS have been identified through epidemiologic studies, which demonstrate a strong correlation between infant sleep position, sleeping environment, and SIDS (American Academy of Pediatrics [AAP], 2005). The Back to Sleep campaign started in 1994 with the goals of spreading safe sleep messages within communities and educating caregivers and health care providers on strategies to reduce the incidence of SIDS. The accomplishment of the campaign has been associated with more than a 50% decline in deaths from SIDS since the beginning of the campaign until 2000, but during the past decade, the SIDS rate has remained constant (Centers for Disease Control and Prevention, 2006).

Despite the success of the Back to Sleep campaign, SIDS remains the third-leading cause of infant mortality in the United States (Mathews & MacDorman, 2013), and the majority of these deaths still occur when safe sleep recommendations are not followed (Li et al., 2003; Texas Department of State Health Services, 2011; Trachtenberg, Haas, Kinney, Stanley, & Krous, 2012). The expanded campaign, called "Safe to Sleep," was launched by the National Institute of Child Health and Human Development in 2012. The goal of the campaign is to continue to incorporate new and evolving science-based information on safe infant sleep. As part of their activities, Safe to Sleep campaign personnel revised the educational materials to include the latest AAP recommendations. The newly expanded campaign created the Champion initiative to enlist people across the United States to help share safe sleep messages in their local areas. Safe to Sleep Champions are spokespersons for the campaign who are reaching out to the media and their community, as well raising awareness about the campaign and distributing key information about SIDS and other sleep-related causes of infant death (Safe to Sleep, 2013).

HISTORY AND RISK FACTORS

Epidemiology

- The highest risk is between 2 to 4 months (91% of deaths occur between 1 and 6 months of age).
- Preterm and low-birth-weight infants are at increased risk.
- SIDS has a seasonal trend, with more deaths happening in winter months (overheating may play a role).

Demographic Risk Factors

- Racial and ethnic disparities: African American and American Indian/Alaska native infants have the highest risk.
- SIDS is more likely to occur in male infants at a 3:2 ratio.

Maternal Risk Factors

- Teenage mother (< 20 years old)
- Low educational level
- Lower socioeconomic status
- Poor prenatal/postnatal care
- Maternal smoking during pregnancy and after birth
- Use of illicit substances

Sleeping Position and Sleeping Environment

- Prone and side sleeping: The prone sleep position has been recognized as a major risk factor for SIDS. A side sleep position also confers an increased risk (Hauck et al., 2010; Li et al., 2003). The side position is not very stable; it is easier for the infant to roll to the prone position from the side than from the back (AAP, 2005, 2011).
- Infants who were usually placed supine but were placed on their side or prone for the last sleep (i.e., unaccustomed prone sleeping) are at an even higher risk of SIDS (Li et al., 2003).
- Use of soft bedding or pillows in close proximity to the sleeping infant is a risk factor for SIDS (AAP, 2011).
- Overheating: The risk of SIDS may be associated with the amount of clothing on an infant, the room temperature, and the season of the year. It is unclear whether extra clothing and a cold climate are independent factors or a reflection of the use of more potentially asphyxiating soft objects in the sleeping environment during the cold weather.

The prone sleep position has been recognized as a major risk factor for SIDS.

- Co-sleeping with an adult or another child: The risk of SIDS seems to be particularly high when an infant is co-sleeping with multiple people and may increase when the bed sharer is under the influence of alcohol or is overtired. In contrast, room sharing without bed sharing was associated with a reduced risk of SIDS (AAP, 2005).
- Environmental tobacco smoke exposure

Triple-Risk Model

The triple-risk model is the interplay of multiple factors that lead to SIDS.

- A vulnerable infant
- A critical period of development (0 to 12 postnatal months)
- Exogenous stressors (sleeping position and sleeping environment)

EVALUATION

Physical Examination

SIDS is a diagnosis of exclusion, and a thorough post-mortem examination, the infant's clinical history, the family history, and an evaluation of the death scene should fail to demonstrate an adequate cause of death. Investigators must inquire about previous nutritional or developmental abnormalities, previous unexpected sibling death, history of domestic violence, and involvement with Child Protective Services or law enforcement. A full skeletal survey is performed to detect possible fractures, particularly metaphyseal and rib fractures, which are suspicious signs for child abuse.

Death Scene Investigation

The death scene investigation is pivotal for delineating factors that may have contributed to the infant's death. As part of the scene investigation, families and other relevant witnesses are interviewed in an effort to reconstruct the events prior to the infant's death. Questions include at what time the infant was put to sleep, in what position the infant was placed, and in what position the infant was found. A re-enactment using a doll to represent the infant can be helpful. The scene investigation is best performed soon after the infant's death so that bedding is still in place. Bedding should be examined and photographed because the presence of blood-tinged infant secretions on sheets may indicate evidence of airway occlusion (Berkowitz, 2012).

Autopsy

An autopsy is performed on all infants who die suddenly to eliminate any other possible cause of death. As part of the procedure, the eyes are evaluated for the presence of retinal hemorrhages. Blood samples

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