

# **SUDDEN INFANT DEATH SYNDROME**

Sudden Infant Death Syndrome (SIDS) is the diagnosis given for the sudden death of an infant under one year of age that remains unexplained after a complete investigation, which includes an autopsy, examination of the death scene, and review of the symptoms or illnesses the infant had prior to dying and any other pertinent medical history. Because most cases of SIDS occur when a baby is sleeping in a crib, SIDS is also commonly known as crib death.

SIDS is the leading cause of death in infants between 1 month and 1 year of age. Most SIDS deaths occur when a baby is between 1 and 4 months of age. African American children are two to three times more likely than white babies to die of SIDS, and Native American babies are about three times more susceptible. Also, more boys are SIDS victims than girls.

## **What Are the Risk Factors for SIDS?**

A number of factors seem to put a baby at higher risk of dying from SIDS. Babies who sleep on their stomachs are more likely to die of SIDS than those who sleep on their backs. Mothers who smoke during pregnancy are three times more likely to have a SIDS baby, and exposure to passive smoke from smoking by mothers, fathers, and others in the household doubles a baby's risk of SIDS. Other risk factors include mothers who are less than 20 years old at the time of their first pregnancy, babies born to mothers who had no or late prenatal care, and premature or low birth weight babies.

## **What Causes SIDS?**

Mounting evidence suggests that some SIDS babies are born with brain abnormalities that make them vulnerable to sudden death during infancy. Studies of SIDS victims reveal that many SIDS infants have abnormalities in the "arcuate nucleus," a portion of the brain that is likely to be involved in controlling breathing and waking during sleep. Babies born with defects in other portions of the brain or body may also be more prone to a sudden death. These abnormalities may stem from prenatal exposure to a toxic substance, or lack of a vital compound in the prenatal environment, such as sufficient oxygen. Cigarette smoking during pregnancy, for example, can reduce the amount of oxygen the fetus receives.

Scientists believe that the abnormalities that are present at birth may not be sufficient to cause death. Other possibly important events occur after birth such as lack of oxygen, excessive carbon dioxide intake, overheating or an infection. For example, many babies experience a lack of oxygen and excessive carbon dioxide levels when they have respiratory infections that

hamper breathing, or they re-breathe exhaled air trapped in underlying bedding when they sleep on their stomachs. Normally, infants sense such inadequate air intake, and the brain triggers the babies to wake from sleep and cry, and changes their heartbeat or breathing patterns to compensate for the insufficient oxygen and excess carbon dioxide. A baby with a flawed arcuate nucleus, however, might lack this protective mechanism and succumb to SIDS. Such a scenario might explain why babies who sleep on their stomachs are more susceptible to SIDS, and why a disproportionately large number of SIDS babies have been reported to have respiratory infections prior to their deaths. Infections as a trigger for sudden infant death may explain why more SIDS cases occur during the colder months of the year, when respiratory and intestinal infections are more common.

The numbers of cells and proteins generated by the immune system of some SIDS babies have been reported to be higher than normal. Some of these proteins can interact with the brain to alter heart rate and breathing during sleep, or can put the baby into a deep sleep. Such effects might be strong enough to cause the baby's death, particularly if the baby has an underlying brain defect.

Some babies who die suddenly may be born with a metabolic disorder. One such disorder is medium chain acylCoA dehydrogenase deficiency, which prevents the infant from properly processing fatty acids. A build-up of these acid metabolites could eventually lead to a rapid and fatal disruption in breathing and heart functioning. If there is a family history of this disorder or childhood death of unknown cause, genetic screening of the parents by a blood test can determine if they are carriers of this disorder. If one or both parents is found to be a carrier, the baby can be tested soon after birth.

### **What Might Help Lower the Risk of SIDS?**

There currently is no way of predicting which newborns will succumb to SIDS; however, there are a few measures parents can take to lower the risk of their child dying from SIDS.

Good prenatal care, which includes proper nutrition, no smoking or drug or alcohol use by the mother, and frequent medical check-ups beginning early in pregnancy, might help prevent a baby from developing an abnormality that could put him or her at risk for sudden death. These measures may also reduce the chance of having a premature or low birth-weight baby, which also increases the risk for SIDS. Once the baby is born, parents should keep the baby in a smoke-free environment.

Parents and other caregivers should put babies to sleep on their backs as opposed to on their stomachs. Studies have shown that placing babies on their backs to sleep has reduced the number of SIDS cases by as much as a half in countries where infants had traditionally slept on their stomachs. Although babies placed on their sides to sleep have a lower risk of SIDS than

those placed on their stomachs, the back sleep position is the best position for infants from 1 month to 1 year. Babies positioned on their sides to sleep should be placed with their lower arm forward to help prevent them from rolling onto their stomachs.

Many parents place babies on their stomachs to sleep because they think it prevents them from choking on spit-up or vomit during sleep. But studies in countries where there has been a switch from babies sleeping predominantly on their stomachs to sleeping mainly on their backs have not found any evidence of increased risk of choking or other problems.

In some instances, doctors may recommend that babies be placed on their stomachs to sleep if they have disorders such as gastroesophageal reflux or certain upper airway disorders which predispose them to choking or breathing problems while lying on their backs. If a parent is unsure about the best sleep position for their baby, it is always a good idea to talk to the baby's doctor or other health care provider.

A certain amount of tummy time while the infant is awake and being observed is recommended for motor development of the shoulder. In addition, awake time on the stomach may help prevent flat spots from developing on the back of the baby's head. Such physical signs are almost always temporary and will disappear soon after the baby begins to sit up.

Parents should make sure their baby sleeps on a firm mattress or other firm surface. They should avoid using fluffy blankets or covering as well as pillows, sheepskins, blankets, or comforters under the baby. Infants should not be placed to sleep on a waterbed or with soft stuffed toys.

Recently, scientific studies have demonstrated that bedsharing, between mother and baby, can alter sleep patterns of the mother and baby. These studies have led to speculation that bedsharing, sometimes referred to as co-sleeping, may also reduce the risk of SIDS. While bedsharing may have certain benefits (such as encouraging breast feeding), there are not scientific studies demonstrating that bedsharing reduces SIDS. Some studies actually suggest that bedsharing, under certain conditions, may increase the risk of SIDS. If mothers choose to sleep in the same beds with their babies, care should be taken to avoid using soft sleep surfaces. Quilts, blankets, pillows, comforters, or other similar soft materials should not be placed under the baby. The bedsharer should not smoke or use substances such as alcohol or drugs which may impair arousal. It is also important to be aware that unlike cribs, which are designed to meet safety standards for infants, adult beds are not so designed and may carry a risk of accidental entrapment and suffocation.

Babies should be kept warm, but they should not be allowed to get too warm because an overheated baby is more likely to go into a deep sleep from

which it is difficult to arouse. The temperature in the baby's room should feel comfortable to an adult and overdressing the baby should be avoided.

There is some evidence to suggest that breast-feeding might reduce the risk of SIDS. A few studies have found SIDS to be less common in infants who have been breastfed. This may be because breast milk can provide protection from some infections that can trigger sudden death in infants.

Parents should take their babies to their health care provider for regular well baby check-ups and routine immunizations. Claims that immunizations increase the risk of SIDS are not supported by data, and babies who receive their scheduled immunizations are less likely to die of SIDS. If an infant ever has an incident where he or she stops breathing and turns blue or limp, the baby should be medically evaluated for the cause of such an incident.

Although some electronic home monitors can detect and sound an alarm when a baby stops breathing, there is no evidence that such monitors can prevent SIDS. A panel of experts convened by the National Institutes of Health in 1986 recommended that home monitors not be used for babies who do not have an increased risk of sudden unexpected death. The monitors are recommended, however, for infants who have experienced one or more severe episodes during which they stopped breathing and required resuscitation or stimulation, premature infants with apnea, and siblings of two or more SIDS infants. If an incident has occurred or if an infant is on a monitor, parents need to know how to properly use and maintain the device, as well as how to resuscitate their baby if the alarm sounds.

### **How Does a SIDS Baby Affect the Family?**

A SIDS death is a tragedy that can prompt intense emotional reactions among surviving family members. After the initial disbelief, denial, or numbness begins to wear off, parents often fall into a prolonged depression. This depression can affect their sleeping, eating, ability to concentrate, and general energy level. Crying, weeping, incessant talking, and strong feelings of guilt or anger are all normal reactions. Many parents experience unreasonable fears that they, or someone in their family, may be in danger. Over-protection of surviving children and fears for future children is a common reaction.

As the finality of the child's acute death becomes a reality for the parents, recovery occurs. Parents begin to take a more active part in their own lives, which begin to have meaning once again. The pain of their child's death becomes less intense but not forgotten. Birthdays, holidays, and the anniversary of the child's death can trigger periods of intense pain and suffering.

Children will also be affected by the baby's death. They may fear that other members of the family, including themselves, will also suddenly die. Children often also feel guilty about the death of a sibling and may feel that they had something to do with the death. Children may not show their feelings in obvious ways. Although they may deny being upset and seem unconcerned, signs that they are disturbed include intensified clinging to parents, misbehaving, bed-wetting, difficulties in school, and nightmares. It is important to talk to children about the death and explain to them that the baby died because of a medical problem that occurs only in infants in rare instances and cannot occur in them. The National Institute of Child Health and Human Development (NICHD) continues to support research aimed at uncovering what causes SIDS, who is at risk for the disorder, and ways to lower the risk of sudden infant death.

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