REFERENCES

11. Collier C: Total spinal or massive subdural block. Letter in Anaesth Intens Care 10:92–93, 1982

Anesthesiology
63:326–327, 1985

Is There a Risk of General Anesthesia Triggering SIDS? Possibly Not!

DAVID J. STEWARD, M.B.*

Sudden infant death syndrome (SIDS) is the cause of at least 5,000 deaths each year in the United States (1.5–2 deaths per 1,000 live births) and is the leading cause of death between the age of one month and one year of life. The accepted definition of SIDS is “The sudden death of any infant or young child which is unexpected by history and in which a thorough post-mortem examination fails to demonstrate an adequate cause for death.” It is a condition that haunts parents and physicians alike. It is also a condition that alarms the pediatric anesthesiologist, who is concerned that SIDS might be precipitated in the perioperative period. This concern has even prompted some physicians to question whether nonurgent surgery should be deferred in infants who are in the at risk age range for SIDS. This deferral of nonurgent surgery, however, would not affect most infants patients, as most surgical conditions seen in this age group are considered to be at least semi-urgent (e.g., inguinal hernia).

While some factors have been found to be clearly associated with SIDS, the precise identification of those children who are definitely “at risk” is not yet possible. It is also not known whether general anesthesia and surgery might precipitate the occurrence of SIDS in a child who is at risk, in a manner similar to that which has been shown to predispose the ex-premature to perioperative apnea. No studies have correlated the association of general anesthesia and SIDS. It is also not established whether infants who have later succumbed to SIDS had previously been exposed to general anesthesia.

STUDY

This study was approved by the Human Ethics Committee. Medical Records of 35 children who died of sudden infant death syndrome were examined to determine whether any of them had a previous history of receiving general anesthesia at any time. Three infants were found to have required a general anesthetic at some time before their final fatal illness.

REPORT OF THREE CASES

Case 1. A full-term female infant (birth weight—3 kg) of a 17-year-old single mother had an uneventful delivery except for a “cord around the neck.” Neonatal resuscitation was required. Mild physiologic jaundice was present until the infant was four days old, when the child was discharged home with the mother. At age 6 weeks the child was admitted to hospital with a history of vomiting after feeding and a diagnosis of pyloric stenosis. Endotracheal anesthesia with halothane in oxygen was uneventful and the patient was discharged home after 1 week.

At age 16 weeks the child was found in bed with cyanosis and no pulse. Cardiopulmonary resuscitation by ambulance personnel was attempted. Anesthesiology V 63, No 3, Sep 1985

* Professor of Anaesthesia, University of British Columbia.
Received from the Department of Anaesthesia, Children’s Hospital, 4480 Oak Street, Vancouver, British Columbia, Canada, V6H 3V4. Accepted for publication April 23, 1985.
Address reprint requests to Dr. Steward.
Key words: Anaesthesia; pediatric. Complications: SIDS.
successful in restoring cardiac function, but cerebral function was
not regained and the child died 24 h later. Autopsy was performed
and an anatomic diagnosis consistent with SIDS recorded. The
abnormal findings were mild and nonspecific and not adequate to
explain the death.1

Case 2. A female full-term infant had an uneventful delivery and
was healthy until 14 weeks of age, when she suffered second and
third degree burns to 30% of her body surface area. The burns
affected the left side of her face and the thorax. Five general
anesthetics were administered over the next 6 weeks for treat-
ment and skin grafting of the burns. Nitrous oxide and halothane
were given on four occasions and ketamine on one occasion. All these
anesthetics were uneventful, the last one having been given when
the child was 20 weeks of age.

At 26 weeks of age the child was found in bed with cyanosis
and no heart rate. All resuscitation attempts failed. Autopsy was performed
and an anatomic diagnosis consistent with SIDS recorded.

Case 3. A male full-term infant had an uneventful delivery and
did not require resuscitation. Birth weight was 2.72 kg. At 11 days
of age he was admitted to hospital with a soft swelling in the neck,
and at 3 weeks of age a cystic hygroma was excised from over the
erector spinae muscle in the neck. At 5 weeks of age a further
resection of cystic hygroma from the posterior aspect of the neck
was performed. Endotracheal anesthesia with nitrous oxide and
halothane was uneventful for each operation.

Two weeks after the second operation, when the child was 7
weeks old, he was discovered to have cyanosis and no heart rate in
bed. Resuscitation was unsuccessful. At autopsy an anatomic diag-
nosis consistent with SIDS was recorded; there was no evidence of recur-
rence of the cystic hygroma and no suggestion of any direct airway
compression in the neck.

DISCUSSION

The three cases described above illustrate just one simple fact: An infant may undergo an uneventful
general anesthetic but succumb to sudden infant death
syndrome at a time remote from this anesthetic experi-
ence. Thus, a general anesthetic in a potential SIDS
victim will not of necessity trigger SIDS in the periop-
erative period. Indeed, the experience of pediatric anes-
thesiologists is that sudden unexpected death of an
infant in the perioperative period is a very rare phenom-
enon. It must be stressed that this was a retrospective
study and the number of patients involved is small.
These facts do not however completely detract from
the finding that some infants who subsequently died of
SIDS had a history of uneventful general anesthesia.

Current theories of the mechanism of SIDS are varied,
but those that center upon a defect of respiratory
control are favored by many authorities.4 Histologic
findings suggestive of repeated episodes of hypoxia are
frequently found in SIDS victims.5 Knowledge of the
fact that anesthetics and ancillary drugs also may interfere
with this control of ventilation make it dangerously easy
to conclude that general anesthesia might further pre-
dispose the child to SIDS. On the other hand, however,
some factors active in the perioperative period might
serve to decrease the likelihood of SIDS. Discomfort
from a surgical wound and the repeated attentions of
the nursing staff or the infant’s mother might induce a
level of arousal that precludes seriously prolonged apnea
leading to hypoxia.

If indeed there is no causal relationship between
general anesthesia and SIDS, what would be the random
chance of such a pair of events occurring within the
same week? Inguinal hernia, a common surgical condition
in infants, occurs in approximately 1:200 children. Sudden
infant death syndrome may occur as frequently as once in 500 infants. If there is no association between
the two diseases, the chance of one infant suffering both
is 1 in 200 × 500 = 1:100,000. If there is no tendency
for one disease or its treatment (e.g., general anesthesia
for herniotomy) to trigger the other (i.e., SIDS) then
the risk of both conditions occurring within the same 1
week of life is even more remote. SIDS has a peak
incidence in the second and third months, a period of
8 weeks. If a child required herniotomy during the same
period, the probability of SIDS occurring by chance in
the same week as the herniotomy becomes 1 in 200
× 500 × 8 = 1 in 800,000. Thus, the chance association
of sudden infant death syndrome and hernia repair
would indeed be a very rare phenomenon.

In summary, a review of the surgical history of a
group of 35 children who died of SIDS revealed that
three of them had previously undergone surgery with
general anesthesia. The perioperative course was un-
ventful in each case. If, on the basis of this finding, it
is speculated that surgical operation and general anes-
thesia do not trigger SIDS in an at-risk child, then
the chance association of SIDS with a surgical procedure,
though it could occur, would be a very rare event
indeed. This must not, of course, lead the anesthesiologist
to relax his or her vigilance in treating patients who
may be particularly “at risk” for apnea or SIDS. It is
hoped that further prospective studies will define more
closely the true risks of general anesthesia for infants.

REFERENCES


2. Spitzer AR, FOX WW: Sudden infant death syndrome (SIDS)
guidelines for averting tragedy. Postgrad Med 75:125–138,
1984

3. Stewart DJ: Preterm infants are more prone to complications
following minor surgery than are term infants. Anesthesia
56:304–306, 1982

306:959–963, 1982

5. Kelly DH, Shannon DC: Sudden infant death syndrome and
near sudden infant death syndrome: A review of the literature