

Americans was found to be over twice as high as the rate among whites, and African American infants continued to have higher rates of SIDS than whites.

Continuing studies suggested that the side position was being commonly used. It was found that many infants moved from the side to the prone position, and movement from the side to the prone position carried a high risk of SIDS. Additional case-control studies suggested that soft objects and loose bedding as well as overheating were associated with SIDS. These relationships are consistent with the initial finding of an increase of SIDS in colder weather months.

Studies of the infants who slept on their back indicated an increasing in flattening of the head, or plagiocephaly. These changes were shown to be reduced by increasing the amount of "tummy time," or play periods in which infants are placed prone under supervision. Guidelines for tummy time are now part of the evidence-based recommendations.

SIDS continues to be an important cause of infant mortality, and new contributory causes continue to be investigated. SIDS reflects the use of evidence-based public health and the importance of continuing to study and develop new approaches to public health problems.

Discussion Questions

1. Discuss how the problem description component of the evidence-based public health approach suggested hypotheses for the etiology of SIDS.
2. Discuss the types of evidence used to support the relationship between sleeping prone and SIDS as well as the limitations of the evidence.
3. Discuss how the evidence-based recommendations incorporated potential benefits and harms.
4. Discuss how implementation and evaluation worked to establish sleeping on the back as a standard intervention to prevent SIDS.
5. Discuss how the continuing presence of the problem of SIDS has produced a new round of use of the evidence-based public health approach.

OXYGEN USE IN PREMATURE INFANTS AND BLINDNESS

Oxygen seemed like just what premature infants needed to address the underdevelopment of their lungs, which often led to pneumonia and death. Thus in the 1940s, after effective means were developed to administer oxygen to pilots in World War II, physicians began to routinely administer

high-dose oxygen to nearly all premature infants. The unexpected association between high-dose oxygen and blindness only became established after over 10,000 premature infants, including its most famous victim, Stevie Wonder, developed blindness.

The first hint of a problem came in 1942, when a report of five cases of blindness of premature infants in which another cause could be determined appeared in the research literature. Once the condition became known, many more cases were identified that met this definition. The process that produced blindness could be seen upon examining the back of the eye during a clinical examination. Proliferation of blood vessels followed by scarring or fibrosis called retrolental fibrosis (RLF), with subsequent detachment of the retina, could be seen in severe cases that had produced blindness.

Using case-control studies, researchers quickly recognized an association between state-of-the-art medical care provided at the most up-to-date medical centers and blindness due to severe RLF. They examined a range of factors associated with state-of-the-art medical care. Reports of constriction of the retinal arteries in fighter pilots given high-dose oxygen led researchers to look for and find similar findings in infants. They found that longer durations of oxygen administration were associated with longer term and more severe retinal artery constriction.

Reinforcing the accumulating clinical evidence were studies of high-dose oxygen use in a variety of animal species. High-dose oxygen used in premature kittens produced retinal damage similar to RLF. The pattern of constriction of the retinal arteries of kittens while on high-dose oxygen was followed by proliferation of new blood vessels similar to that seen leading to scarring or fibrosis in human infants with RLF.

A cohort study was soon conducted in three hospitals in Melbourne, Australia. One had incubators that could give premature infants air with 2 or 3 times the 20% concentration of oxygen in atmospheric air. The second used a less efficient way of delivering oxygen. The third required patients to pay for supplementary oxygen, so oxygen was rarely used. The medical records for 1948 through 1950 revealed that at the hospitals where oxygen was given most intensively, 19% of premature babies developed evidence of RLF. At the other two, where it was used less aggressively, the rate was only 7%.

A large randomized controlled trial was needed to convince clinicians to restrict the use of oxygen for premature infants, especially because clinicians were concerned that restrictions in oxygen use would result in brain damage and a higher mortality rate. A large randomized controlled trial sponsored by NIH was soon conducted at 18 institutions by

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