

Commentary on Neonatal Surgical Mortality

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COMMENTARY

Neonatal surgical mortality has steadily fallen over the last five decades. Improved survival does not appear to be related to the introduction of new operative procedures. Most of the basic procedures were developed by 1960. Eight developments appear to be responsible:

- The growth of pediatric surgery resulted in widespread availability of neonatal surgeons and dissemination of knowledge about new-born surgical emergencies.
- The parallel growth of pediatric anesthesia, beginning in 1946, provided specialized intraoperative management of the neonate.
- Understanding neonatal physiology is the key to successful management; major advances occurred between 1950 and 1970.
- New inventions revolutionized patient care; the transistors (1947) made it possible for medical devices to sense, amplify and control physiologic responses and opened the communication and computer age.
- Neonatal mechanical ventilation had a prohibitive mortality and was seldom utilized; the development of CPAP and a continuous flow ventilator in the 1970s allowed safe ventilatory support.
- Total parenteral nutrition (1968) prevented starvation that frequently affected infants with major anomalies.
- The effective treatment of infection began with the clinical use of penicillin (1941); antibiotics have reduced mortality but infants suffering from the septic syndrome have a

prohibitive mortality; cytokine, proinflammatory agent research, and the development of anti-inflammatory and blocking agents in the 1980s have not affected mortality.

- The establishment of new-born intensive care units (1960) provided an environment, equipment, and staff for effective physiologic management.

The principal causes of neonatal surgical mortality are now complications of premature, uncorrectable abnormalities of the heart, lungs, kidney, and central nervous system, inborn errors of metabolism, and infection. There has been a significant reduction in premature deaths, particularly in infants below 1,000 g. Unfortunately, there has been no progress in preventing prematurity. Prevention of prematurity alone would have a profound effect on all new-born mortality. At present it is not possible to predict what the effect of improved prenatal diagnosis of congenital abnormalities will have. Three approaches are available or being developed when the diagnosis of malformation is made before birth. Abortion is an option fraught with ethical, philosophic, and religious controversy. Fetal surgery is still in its pioneering stage as a practical method of treating anomalies. A few centres have had success with intrauterine correction of carefully selected abnormalities. Gene therapy holds great promise but is still at the experimental stages. New antibiotics are rapidly being developed but resistance is a biologic phenomenon that will not be prevented by new drugs. Immunotherapy and blocking the inflammatory cascade has not proven effective in treating the septic syndrome. However, considerable progress has been made in understanding the inflammatory process and may bring us closer to an effective treatment for overwhelming sepsis and multiple organ failure in the future.

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