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Introduction:

Anesthesia mortality declined in developed countries, but remains significantly higher in developing nations (1:150-600 vs 1:25,000-250,000). Few studies address pediatric anesthesia care in developing countries. A survey in Uganda reported only 13% of anesthetists had the capacity to provide safe pediatric anesthesia². Pediatric perioperative mortality increased in the last decade, with a much higher rate in developing countries, where a lack of training, monitoring, and equipment are typical². Sierra Leone is one of the poorest countries in the world and ranks poorly in infant mortality³. We conducted a survey of anesthesia practice prior to deploying an anesthesia machine designed for austere settings.

Methods:

With IRB approval, we conducted a prospective observational study of anesthesia practice at Connaught Hospital and Princess Christian Maternity Hospital (PCMH) in Freetown, Sierra Leone between 6/12 and 2/13. Data collected included preoperative assessment, anesthetic technique, monitors used, equipment failure, and 30-day morbidity and mortality rates.

Results:

Connaught Hospital has 12 nurse and 1 physician anesthetists; PCMH has 10 nurse and 1 physician anesthetists. We observed 92 pediatric anesthetics. The average patient age was 8.6 years (1 month-18 years), with 10% infants. The majority were ASA 1 (60%) or ASA 2 (34%), with emergencies comprising 10% of cases. Multiple surgical procedures were observed with herniorrhaphy (35%) and Cesarean sections (15%) the most common. In the 15 C-sections observed, 3 newborns died (20%), but otherwise no patients died in this study. Pulse oximetry was used in 81% of cases and blood pressure monitoring 47%; oxygen was provided in 85% of cases. There were 9 power outages and 1 machine malfunction.

General anesthesia was administered in 79% of the observed cases (55% inhalational and 15% TIVA). Regional anesthesia was performed on 12% of patients (all spinals except for 1 peripheral nerve block). Local anesthetic only was given to 2 patients. During GA, face mask was used 59% of the time, ETT used in 33%, and a LMA was placed rarely (0.03%). Oral airway use was common (55%). In 3 cases, spinal anesthesia was converted to GA intra-op. Halothane was the predominant inhalation agent (>99%). Ketamine was the most common IV agent (62%) followed by diazepam/midazolam (46%). Atropine was administered commonly (75%) and succinylcholine was used in 23% of GA cases.

Conclusions:

Anesthesia care providers were predominantly nurse anesthetists. In a significant number of patients, blood pressure and pulse oximetry were not utilized. Equipment malfunctions were not uncommon (11% of cases). A review of current local practice is being used to guide the implementation of system changes to improve patient outcomes and engage local providers in an austere environment.

References:

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