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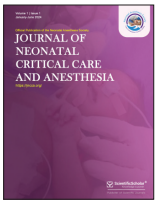

Guest Editorial

Safety in Neonatal Anesthesia, a Major Concern

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Sir Robert Reynolds Macintosh has quoted almost six decades back; "Theme of the clinical academic practice of Anesthesia should be based on the triad of Science, Safety, and Simplicity". The first two words, Science and Safety will hold true at all times. However, Simplicity has to be considered in a different context.

The complexity of surgical conditions in the neonate causes significant physiological perturbations. Hence, providing anesthesia for perioperative management and also for procedures in the non-operative room, that is, remote locations is a daunting task for the anesthesiologist. At the same time, the demand for excellence in anesthesia can be achieved only by incorporating advanced anesthesia machines, monitoring systems, special skills, and various complex procedures. Safety and Quality, these words are interlinked. When the quality of delivery of anesthesia improves, the safety is taken care of. When safety is considered as the primary goal, quality needs to be maintained.

In the neonate with already disturbed physiology due to various surgical scenarios, immaturity of respiratory and cardiovascular systems coupled with increased oxygen demand and cardiac output, increase the risk manifold. Transitional circulation, brain immaturity, fragile blood vessels, and immature thermoregulation can also pose major problems. Maturational trends of hepatic and renal functions and their metabolic and elimination processes differ in every individual from very low birth weight neonates to full-term neonates.

Foundation of safety in neonatal anesthesia is based on four Pillars – Anticipation of problems, ultimate precision, continuous vigilance, and prompt action. Since there is a plethora of various surgical scenarios, one needs to study every neonate individually. The risk gets magnified when neonates have congenital anomalies involving multiple systems. Knowledge of risk assessment tools helps in predicting perioperative risk of morbidity and mortality. Neurological, airway, respiratory, cardiovascular, and others-surgical severity (NARCO-SS) is a specifically designed tool for objective pediatric perioperative risk stratification[1] (NARCO-others include-[hepatic, renal, endocrine, and hematological], SS relates to severity of surgery).

Success can only be achieved by adhering to protocol. (1) Proper evaluation to assess the risk will include obtaining complete history from the time of birth along with family history, carrying out proper physical examination of all systems and syndromic features, airway, musculoskeletal issues, monitoring vital parameters, getting relevant laboratory investigations, and imaging as and when required. (2) Preparation and stabilization of the neonate, preparation of the operating room, also remote locations are essential prerequisites. These will include keeping the operating room warm, preparing precise drug dosages, and precise infusion of warm perioperative fluids and blood products, and use of appropriate anesthesia equipment. (3) Continuous vigilance of physical signs, perioperative monitoring of vital parameters and surgical field is mandatory. (4) Extreme alertness and skills are required to take appropriate prompt action and care whenever there is an adverse event or physiological derangement.

Introducing specific training programs and multidisciplinary teaching programs to sustain and enhance clinical skills to make competent neonatal anesthesiologists will certainly fulfill the aim. Training should include cardiopulmonary resuscitation, management of difficult airway, management of acute severe bleeding; ongoing fluid losses, adverse respiratory events, neonatal ventilation, one lung ventilation, and specific case-based tutoring, that is, venous access, fluid management, pain management, and overall anesthetic management. Simulation-based hands on workshops and providing guidelines and algorithms can aid the learning process for students smoother. Imparting knowledge can be carried out on various platforms by organizing small group lectures, and continuing medical education through seminars, panel discussions, and annual conferences.

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A formal structured institutional checklist regarding clinical scenario and diagnosis, intended anesthetic management and surgical procedure before any surgery or procedure can establish a benchmark for overall perioperative anesthesia safety and quality. Studies have highlighted the role of expertise as the best performance guarantee.[2] Teamwork involving an anesthesiologist, pediatric surgeon, neonatologist, and neonatal intensive care unit staff facilitates smoother perioperative outcomes. Time-to-time communication, sharing data information, and harmonizing efforts certainly help anesthesiologists to minimize the complications and morbidity and cruise through safely in adverse situations.

Complete involvement in the patient with full concentration, gentle handling skills, tender loving care, empathetic motherly attitude, and last but not the least continuous updated KNOWLEDGE, provide the impetus for a successful approach to safety in neonatal anesthesia.

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