Title: PEDIATRIC COMPLICATIONS IN THE POSTOPERATIVE PERIOD: NOT A SMALL PROBLEM

Authors: C. Bell, M.D., R. Hines, M.D., P. Barash, M.D., G. Watrous, R.N., T. O'Connor, M.D.

Affiliation: Department of Anesthesiology, Yale University School of Medicine, Yale-New Haven Hospital, New Haven, CT 06510

A notion exists that those pediatric patients who may be at increased risk for development of postoperative complications can be identified preoperatively. Anticipated risks, particularly apnea, bradycardia, and subglottic stenosis appear to be more prevalent among pediatric patients with a past medical history of prematurity and/or previous respiratory disease. In addition, recent studies have demonstrated that all pediatric patients, event those without identifiable risk factors are susceptible to hypoxemia in the postoperative period.[1] However, information on the overall incidence of complications during the PAR stay in pediatric patients and their relationship to intraoperative events is lacking. Therefore, the following prospective study was designed as part of our ongoing quality assurance program to investigate the incidence of complications in pediatric patients occurring intraoperatively and in the post anesthesia recovery room (PAR).

Methods. Following approval of the Human Investigation Committee, a prospective study of 653 consecutive pediatric patients (ages 0-10 years) entering the PAR was performed. For basis of comparison the patients were separated into Group A (age < 1 year, N = 182), Group B (age 1-2, N = 126), and Group C (age 2-10, N = 365). All patients were ASA status I, II, or III. Any patient requiring direct admission to the intensive care unit was excluded. Data was collected using a standard form developed to determine the incidence of intraoperative and PAR complications. Reportable complications were defined as: hypertension, hypotension, dysrhythmia, nausea and vomiting, drug reaction, respiratory difficulty (minor and major), cardiac events, and alterations in mental status. Defined criteria were used for each of the above complications. Intraoperative events were recorded by the anesthesiologist assigned to the case. PAR complications were recorded by the nursing staff. Data are expressed as percentage or mean + standard deviation. Statistical analysis was performed using chi square and student t-test.

Results. The overall PAR complication rate was 14.2%. The duration of anesthesia had no statistically significant effect on the complication rate or length of PAR stay. However, type of operative procedure did correlate with intra- and postoperative morbidity. In Group A (< 1 year) the highest incidence of intraoperative complications was seen in patients undergoing orthopedic procedures (14.2%, $P < 0.05$) and abdominal procedures (8.3%, $P < 0.05$). Within this age group, the highest PAR complication rate was found among ENT patients (38.3%, $P < 0.02$). Complication rate was not effected by ASA status in Group A patients. One patient from this group required an unscheduled ICU admission for a postoperative airway problem.

In Group B (age 1-2 years), patients undergoing orthopedic procedures had the highest incidence of intraoperative complications. Among Group B patients, an increase in the PAR complication rate was found following ENT (28.6%, $P < 0.05$), orthopedic (23%, $P < 0.05$) and abdominal operations (19%, $P < 0.05$). Once again, ASA status had no effect on the rate of intraoperative or postoperative complications in these patients.

In Group C (age 2-10 years), patients undergoing ENT procedures experienced the highest incidence of both PAR and intraoperative complications, 45.8% and 60% respectively ($P < 0.01$). In Group C more complications were seen among ASA I and II patients than was observed in ASA III patients ($P < 0.01$).

Conclusions. These data identify pediatric patients who may be at an increased risk for the development of intraoperative and immediate postoperative complications. Specifically, age had no significant affect on the incidence of overall complication rates. In fact, the lowest PAR complication rate was observed in children < 1 year of age (Group A)(Table 1). ENT procedures traditionally assumed to have a low postoperative morbidity, were associated with the highest PAR complication rate. Of note, the older child (i.e., 2-10 years) appears to be at an increased risk for postoperative ENT problems despite the larger, more well developed airway.

Our data demonstrates that anticipation of PAR complications in children should not be based solely on age or ASA classification. Procedures involving the head and neck and airway may increase morbidity even in healthy pediatric patients.

Table 1: Pediatric Complication Rates

	Overall	PAR	OR
Group A (< 1 year)	18.1%	12.6%	6.6%
Group B (1-2 years)	19.0%	16.7%	4.8%
Group C (2-10 years)	18.6%	16.2%	4.1%

Reference

1. Motoyama EK, Glazener CH: Hypoxemia after general anesthesia in children. Anesth Analg 65:267-72, 1986.