



## CHALLENGES IN ADMINISTERING ANESTHESIA FOR EMERGENCY SURGERY IN PERIPHERAL TEACHING HOSPITALS

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### ABSTRACT

The factors that may hamper adequate anesthesia support to emergency surgery in peripheral teaching hospitals have not been systemically explored in the Indian setting. We conducted a questionnaire-based observational study in two small town teaching hospitals to address the current knowledge gap in the context of non-obstetrical emergency surgery.

**Results:** Data from 65 cases (65.6% males; median age 30 years; 37% referred; 83.1% general surgery cases) were analyzed. Majority hailed from socioeconomically weaker strata and had little formal education. Proper history of the current illness could be obtained from 29.2%. There was lack of awareness regarding major co-morbidities like ischemic heart disease, asthma, epilepsy, diabetes and drug allergy. At presentation, 74% subjects were suboptimal in terms of fluid balance or hemoglobin status. Many cases had to be taken up for surgery without support of chest X-ray, hemogram, serum creatinine, electrolytes and coagulation profile. Availability of anesthesia equipment, emergency drugs and nursing support were satisfactory. However, necessary blood components were not available in all cases. In most instances the attending anesthetist was alone without assistants or peers to call upon in case of need. Senior (consultant) colleagues were available only over phone. ICU support was also not optimum.

**Conclusions:** Anesthesiologists working in peripheral hospitals in India are likely to come across many impediments that our study has documented. Some stem from socioeconomic factors like illiteracy which cannot be resolved in the short-term. However, system related impediments can be removed through administrative will and measures such as increasing staff on emergency duty, emergency investigation support and strengthening of ICU facilities.

### KEYWORDS :

#### INTRODUCTION

Emergency admissions to hospital have increased considerably over the past 15 years around the world.<sup>[1]</sup> A large proportion of these patients, often elderly, present with surgical emergencies. The range of such emergencies encompass traumatic injuries, pathological fractures, various types of acute abdomen (e.g. appendicitis and appendicular perforations, peptic perforations, bowel obstruction, diverticulitis), emergencies specific to pediatric populations (e.g. foreign body obstructions, intussusceptions, malrotation/volvulus of gut or ischemic bowel) and gynecological and obstetrical emergencies.

Lack of adequate anesthesia support may often delay emergency surgery and contribute to suboptimal outcomes even in tertiary care centers located outside of major cities. Even if available, anesthetists may be hampered by various factors like logistical shortcomings, lack of proper medical records and inadequate diagnostic support to assess for critical comorbidities.<sup>[2-4]</sup> For instance, it has been reported that the coexistence of bronchial asthma in the surgical patient has the potential to increase the risk of morbidity and mortality in the perioperative period if not recognized and adequately managed.<sup>[5]</sup> Asthma could easily be missed in illiterate patients without proper medical records presenting for emergency surgery. Aspiration rate is high in emergency patients, particularly those with impaired consciousness. Antacids and prokinetic drugs have not been shown to improve the outcome after aspiration and are to be administered prophylactically. Although rapid sequence induction is considered the standard of care for non-fasting emergency cases, well-controlled trials to support this practice are lacking. We have therefore planned an observational study to address the current knowledge gap in the context of non-obstetrical emergency surgery. We have selected peripheral teaching hospitals as a large number of emergency surgery cases, often complicated, get referred to these hospitals and

resource constraints may be greater. We hope that this background knowledge will help anesthesiologists working in peripheral hospitals to better anticipate and meet such challenges and health administrators to address relevant resource gaps.

#### MATERIALS AND METHODS

The study was designed as a cross-sectional descriptive observational study and was conducted at two medical college hospitals in West Bengal situated outside Kolkata. It conformed to research ethics principles enshrined in the Declaration of Helsinki and the study protocol was approved by the Institutional Ethics Committee. Waiver of informed consent requirement was sought from the committee on two grounds – the study being entirely questionnaire based would involve less than minimal risk to the participants and in an emergency situation many patients will be too incapacitated to comprehend an informed consent document and the attending caregiver may not be the legally acceptable representative – and was granted.

Patients attending emergency were eligible to participate in the study if they were at least 1 year of age and were posted for emergency surgery procedure under anesthesia. Obstetric emergency delivery cases were excluded (because of the high obstetric case load they would have accounted for disproportionately large number of cases). The other exclusion criterion was lack of caregiver to verify relevant information or to provide such information when the patient is incapacitated or minor.

The questionnaire used in this study comprised a mix of closed and open-ended responses. It was subjected to face and content validation by two senior anesthesiologists and was pilot tested in one medical college hospital. It was administered to the patient along with the caregiver through face-to-face interview. Therefore, no translation to vernacular

version was needed. The presence of the caregiver was deemed essential because many patients were too stressed to respond coherently, and the information had to be verified from another source.

Being an observational study, we did not go in for a formal sample size calculation. However, we planned to recruit at least 100 subjects over a period of 6 months. Regarding statistical analysis, data were summarized by routine descriptive statistics, namely mean and standard deviation for numerical variables when normally distributed, median and interquartile range (IQR) when skewed, and counts and percentages for categorical variables. Statistica version 8 (Tulsa, Oklahoma: StatSoft Inc.) and MedCalc version 11.6 (Mariakerke, Belgium: MedCalc Software) software were employed for statistical analysis.

## RESULTS

We screened 120 subjects Seventeen subjects were excluded because of multiple missing data items. Therefore, analysis has been done for 65 participants. Of these, 64.62% were males. Hindus and Muslims, the two major religious groups in the catchment area of the hospitals, had nearly 50:50 representation in the sample. Education-wise, 35.38% were illiterate and only 23.08% had progressed beyond primary education. The great majority (83.08%) had family income below Indian Rupees 6000/- per month.

The age range of the participants was wide (3 – 75 years) with median age 30 years and IQR 17 – 50 years. The time of onset of the symptoms that prompted hospitalization ranged from 2 to 168 hours prior to first assessment at the tertiary care level, with median (IQR) of 24 (13 – 48) hours. Total 72.31% underwent emergency surgery under general anesthesia, rest receiving spinal anesthesia. Of the 65 participants, 83.08% were considered primarily general surgery cases; 9.23% obstetric related cases (emergency operative deliveries were excluded, as already stated), 6.15% ENT cases and 1.54% orthopedic cases. The duration of surgery ranged between 10 to 210 minutes with median (IQR) of 60 (30 – 60) minutes.

In case of most study subjects (73; 81.54%) no referral was considered necessary. Outcome-wise, 57 (87.69%) subjects had uneventful recovery from the anesthesia episode; 5 (7.69%) recovered with some sequelae such as delayed reversal or postoperative nausea & vomiting, and 3 (4.62%) faced a stormy recovery in terms of recurrent apneic spells or suboptimal airway reflexes. Only 1 subject (1.54%) required postoperative ICU admission.

## DISCUSSION

Several impediments to satisfactory anesthesia outcome have been identified in our observational study. While both genders have been well represented, the great majority of our study participants hailed from socioeconomically weaker section of the society and had received little or no formal education. This is a direct contributing factor to other obstacles such as inability to give a proper history of the current illness in nearly 70% cases and lack of awareness regarding major comorbidities, including ischemic heart disease, bronchial asthma, epilepsy, diabetes mellitus and drug allergy. However, reassuringly, 100% were aware of their blood pressure status. Large number of patients in the emergency setting may have hyperglycemia and it has been estimated that blood glucose levels exceeding 200 mg/dL in the first 24 h after admission are associated with greater mortality in emergency trauma patients.<sup>[9]</sup> Fortunately, glucose levels can be readily measured and corrective action taken. Contrast this situation with Hepatitis B and HIV status. Understandably, the great majority of study subjects were unaware of their status in this regard, and these subjects had to be taken up for surgery with such status still unknown because of the lack of emergency testing. Therefore, this poses a grave risk to all healthcare providers, including anesthetists.

Emergency anesthesia is associated with increased risk of pulmonary aspiration of gastric contents unless tackled by rapid sequence induction.<sup>[6,7]</sup> Aspiration risk is particularly high in those who also have impaired consciousness. Stress, pain, raised catecholamine levels, and administration of opioids delay gastric emptying and further increase risk. To reduce aspiration risk, it is important for subjects to remain nil by mouth for at least 6 hours with regard to solids and 2 hours with regard to fluids. In our series, this precondition was violated in around 15% of the patients. While it is true that decision about when to operate needs to be based on clinical urgency and not hours of fasting and fasting does not provide a watertight guarantee against aspiration, the practice does reduce risk and therefore is recommended in guidelines.<sup>[10]</sup>

traoperative hypotension may be associated with increased mortality.<sup>[11]</sup> Intraoperative hypoxia is also associated with a poorer outcome, though the association may not be as strong as that for hypotension.

However, necessary blood components were not available in all cases and situation had to be managed by skillful fluid resuscitation. Adequate nursing support was available in 100% cases. However, in most instances the attending anesthetist was alone without assistants or peers to call upon in case of need. Senior (consultant) colleagues were available only over phone. Experienced consultants from other disciplines were not available in all required instances. The worst situation was regarding non-technical support manpower (e.g. OT boys, ward boys, security staff) who were non-available or missing in many instances. ICU support was also not available in all cases when it was deemed necessary, increasing the load upon the anesthesia care team. The lack of trained assistants and support from colleagues has been stated in an earlier report from rural India.<sup>[2]</sup>

Our study has its share of limitations. The sample size is relatively small, and our sampling strategy was purposive rather than random sampling. We had to exclude several subjects since the history of the present illness as well as past history could not be obtained properly and there was lack of accompanying family caregivers from whom the information could be reliably verified. The small sample size also precluded subgroup analysis such as comparisons between the two study hospitals.

Anesthesiologists working in resource constrained settings in India are likely to come across many impediments with potential negative influence on the outcome. Our study has documented these impediments prospectively through direct interactions with patients posted for emergency surgery in two rural hospitals, and their caregivers.

## REFERENCES

1. Wittenberg R, Sharpin L, McCormick B, Hurst J. Understanding emergency hospital admissions of older people. Oxford: CHSEO; 2014.
2. Bumb SS, Dodammani A, Jadhav H. Use of anesthesia in rural India: constraints that come across. *Int Res J Clin Med* 2016; 1: 17-9.
3. Singh PM, Kumar A, Trikhia A. Rural perspective about anesthesia and anesthesiologist: A cross-sectional study. *J Anesthesiol Clin Pharmacol* 2013; 29: 228-34.
4. Dienne P, Diète-Spiff K, Chukwuma N. Practice of anaesthesia and surgery in a rural clinic: meeting the challenge. *Turkish J Fam Med Prim Care* 2014; 8: 48-54.
5. Lawal I, Bakari AG. Reactive airway and anaesthesia: challenge to the anaesthetist and the way forward. *Afr Health Sci* 2009; 9: 167-9.
6. Wig J, Ghai B, Makkar JK. Emergency anaesthesia for unprepared patients: a Review. *Ind J Anaesth* 2008; 52(Suppl5):676-87.
7. Gray LD, Morris C. The principles and conduct of anaesthesia for emergency surgery. *Anaesthesia* 2013; 68 (Suppl 1): 14-9.
8. Idriss A, Shivute N, Bickler S, Cole-Ceasay R, Jargo B, Abdullah F, et al. Emergency, anaesthetic and essential surgical capacity in the Gambia. *Bull World Health Organ* 2011; 89: 565-72.
9. Laird AM, Miller PR, Kilgo PD, Meredith JW, Chang MC. Relationship of early hyperglycemia to mortality in trauma patients. *J Trauma* 2004; 56: 1058-62.
10. Søreide E, Ljungqvist O. Modern preoperative fasting guidelines: a summary of the present recommendations and remaining questions. *Best Pract Res Clin Anaesthesiol* 2006; 20: 483-91.
11. Pietsopaoli JA, Rogers FB, Shackford SR, Wald SL, Schmoker JD, Zhuang J. The deleterious effects of intraoperative hypotension on outcome in patients with severe head injuries. *J Trauma* 1992; 33: 403-7.