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Procedural Sedation and Analgesia in the Emergency Department: What Are the Risks?

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Practicing emergency medicine physicians routinely administer agents to provide sedation and pain control. An experiment, in effect, is conducted each time this is done; in this experiment we ask, "what are the risks and benefits of achieving our endpoint of this experiment." To best answer this question, the emergency physician must be aware of the risks involved with the procedure as well as the side effects and toxicity associated with the agents used for sedation and pain control. This article will describe the major adverse events the clinician will likely encounter in the emergency department (ED) when conducting procedural sedation and pain control, and will discuss factors that contribute to untoward events.

Epidemiology of procedural sedation and analgesic adverse events

There are many difficulties in determining the prevalence or incidence of adverse events related to procedural sedation and analgesia (PSA) in the ED. There is no uniform definition of an "adverse event." Adverse events following PSA reported in the literature include hypoxia, apnea, stridor, laryngospasm, bronchospasm, cardiovascular instability, paradoxic reactions, emergence reactions, emesis, and aspiration [1]. Prolonged sedation

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may also be considered an adverse event. In addition, delayed side effects after a patient is discharged to home may also be of significance and may often be overlooked [2]. Malviya et al [2] found that motor imbalance, agitation, and restlessness were not uncommon findings at home in children who were sedated for a diagnostic procedure. Adverse events are also likely to vary with the type of facility where PSA is used, the specialty of the physician administering PSA, patient age and comorbidity, level of patient monitoring, and patient assessment before PSA. One recent pediatric study identified that adverse events after PSA were more likely in nonhospital-based facilities with inadequate or inconsistent monitoring, inadequate presedation medical evaluation, medication errors, and lack of an independent observer [3]. Despite these apparent differences in patient population, hospital facilities, and specialty practicing PSA, the incidence of major adverse events such as respiratory compromise, hypotension, laryngospasm, or dysrhythmias has been reported to be less than 1% in most studies [1]. Incidence of minor events with mild or minimal clinical impact (eg, nausea, pruritis, transient hypoxia) tends to vary depending on the study and the drugs used in the study population. With respect to minor adverse events, a risk–benefit analysis that focuses on whether patients would accept a small risk of suffering an adverse event, given that their pain was adequately managed, might be necessary.

The authors' opinion is that adverse events related to PSA are likely to occur despite the best of scenarios. However, this incidence is likely to be low if proper precautionary measures are taken as outlined by standardized guidelines such as the American College of Emergency Physicians (ACEP) Clinical Policy for PSA in the ED [1]. Inadequate use of sedation and analgesia resulting in a high failure rate (eg, >20%) will result in significant patient dissatisfaction and reduction in patient's quality of life. Arguably, there might be a slight reduction in the overall incidence of adverse events if a higher PSA failure rate is accepted to be the norm. However, a higher incidence of PSA failure with only a marginal reduction in adverse events is unlikely to be desirable by the patient. A more cogent approach might be to provide adequate sedation with appropriate presedation evaluation, monitoring, and preparation for treatment of any potential complication. Given the advanced training of the emergency physician in airway management, vascular access, resuscitation, and pharmacology (of PSA and PSA reversal drugs), the incidence of adverse events are not likely to be higher when an adequate amount, type, and combination of PSA drugs are used with the goal of lower failure rate in mind. The armamentarium of PSA agents available to clinicians today makes the scenario of increased patient satisfaction without increased adverse events possible by allowing for avoidance of agents with unpredictable and life-threatening side effects [4].

Pena et al [5] found the adverse event rate PSA was 2.3% in an urban pediatric ED, although none required intubation or admission. There were