Rocuronium in paediatric ICU

To the Editor:
Dr. J.D. Tobias' paper describing rocuronium infusion in the paediatric intensive care setting (Can J Anaesth 1996; 43: 353–7) is a valuable addition to the literature. The PICU is as well populated with "therapeutic orphans" as is paediatric anaesthesia and any attempts to provide a scientific basis for the use of drugs in this setting are to be applauded.

Rocuronium use is currently spreading as many hospital pharmacies withdraw vecuronium from general use. Thus many PICUs may be considering the use of rocuronium as a replacement. This is the first publication to describe the use of rocuronium as an infusion for several days' duration.

However, the results should not be over interpreted. As Dr. Tobias points out, the wide age range included in the study may be one factor in the dose variability described. The conclusion that regular monitoring of neuromuscular blockade in this setting is essential is well taken. However, an age-related dose range would be very useful to clinicians. No relationship between age and dose was described – was there one? Also a graphical breakdown of age would be useful in interpreting the data e.g., how many patients fell within the <6 months, <1 year etc. ranges?

Other factors affecting dose include concurrent administration of drugs which may affect metabolism or effect of rocuronium. Since some patients were being treated for elevated ICP these may have been receiving barbiturates. If so were liver enzymes mildly induced (Dr. Tobias excludes LFTs of ≥ twice normal)? A list of concurrent medications would be helpful.

Until, and almost certainly after, we have more extensive information on dose requirements at different age ranges regular neuromuscular monitoring of these patients should be employed.

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REPLY

Thank you for your interest and comments concerning my paper reporting the use of rocuronium for neuromuscular blockade in the paediatric ICU patient.[1] I share your interest in information concerning the appropriate use of new agents in the paediatric ICU population. Unfortunately, as you have pointed out, paediatric ICU patients may be "therapeutic orphans" in that we have limited clinical information concerning the use of many therapeutic agents in this population as opposed to adult patients. While the adult studies may provide a basis for the use of these agents in the paediatric population, considerable differences can occur in children and we should not think of them as merely small adults.

Unfortunately, because of the limited number of patients in the study (n = 20), I am unable to make any definite conclusions concerning differences in dosing requirements in regard to age or concurrent medication use. When analyzed, no differences were noted with regard to age; however, with a sample size of 20 and only four patients <12 months, it is possible that a type II error existed. Likewise, there were only two patients receiving barbiturates and therefore no conclusion can be drawn regarding the effects of barbiturates on rocuronium dosing requirements. In a previous study,[2] we noted an increase in pancuronium requirements (0.056 vs 0.14 $mg \cdot kg^{-1} \cdot hr^{-1}$, $P < 0.05$) in seven of 25 patients receiving anticonvulsants including barbiturates, phenytoin, and carbamazepine.

Regardless of these issues, I concur that whenever neuromuscular blocking agents are used, monitoring of neuromuscular blockade is strongly recommended. Both of our previous studies,[1,2] have demonstrated eight- to 10-fold variations in the doses required to maintain one twitch of the train-of-four. Such variability is to be expected in a population as varied as the paediatric ICU population. This variability may relate to age, underlying illness or the administration of other medications. Additionally, while rocuronium offers the advantage of limited cardiovascular effects, as it is dependent on hepatic metabolism, other agents (atracurium or cis-atracurium) may be more appropriate in patients with hepatic dysfunction.

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1 *Tobias JD.* Continuous infusion of rocuronium in a paediatric intensive care unit. Can J Anaesth 1996; 43: 353–7.
2 *Tobias JD, Lynch A, McDuffee, Garrett JS.* Pancuronium infusion for neuromuscular blockade in children in the pediatric intensive care unit. Anesth Analg 1995; 81: 13–6.

Aseptic meningitis using the needle-through-needle technique

To the Editor:
Cascio and Heath[1] described a case report of meningitis following a combined spinal-epidural technique in a labouring term parturient. They used a 17G Hustead needle (Concord/Portex, Keene, NH 03431) for the epidural and a 25G 12.3 cm long Quincke spinal needle (Becton/Dickinson, Franklin Lakes, NJ 07417) for the spinal by the needle-through-needle technique. Sixteen hours after delivery the parturient's body temperature increased to 38.7° and she complained of a non-positional frontal headache. This was associated with chills, photophobia and mild nuchal rigidity. Diagnostic lumbar puncture revealed cloudy CSF with increased polymorphonuclear white cell count, increased protein and decreased glucose concentrations. All cultures from the CSF remained negative until 72 hr when a single broth culture grew a possible contaminant, streptococcus salivarius with no bacterial growth on the culture plates. Despite that, an empirical diagnosis of bacterial meningitis was made and antibiotics were started with vancomycin 1 g every 12 hr and ceftriaxone 2 g every 8 hr *iv*. The patient was afebrile after 12 hr and asymptomatic by 24 hr.

In their discussion, Cascio and Heath described the two cases of Harding *et al.*[2] However, they did not mention my comment on that article.[3]

Their case can be a case of aseptic meningitis due to metallic micro particles produced by the needle-through-needle technique for combined spinal-epidural anaesthesia. The details of this proposal were described in several letters.[4–6] A