Evaluation of the stability and efficacy of a propofol-rocuronium mixture

To the Editor:

Alternative strategies to reduce the onset time of nondepolarizing muscle relaxants, such as priming,[1] administering large doses[2] and using the timing principle[3,4] have not been completely succesful. We have used a propofol- rocuronium mixture for the rapid induction of anesthesia. First however, we tested whether a propofol-rocuronium mixture is stable.

UV spectra were obtained on a Shimadzu UV 2100 sec spectrophotometer (10 mg·100 mL^{-1} in acetonitrile). A model 600 Waters pump was connected to a 200 µL loop injector and a µBondapak CN column (150 mm × 3.9 mm internal diameter; Waters assoc. Milford, MA, USA). Model 481 Waters UV detector and Unicam ProGC Data Station were used. Compounds were detected at 220 nm. The peak height was used for quantitation. The mobile phase was acetonitrile-water (60:40, v/v). The flow rate, injection volume and detector response were 0.7 $mL \cdot mL^{-1}$, 5 µL and 15 µL and 100 mV, respectively.

High pressure liquid chromatography (HPLC) method: standard stock solutions were freshly prepared with acetonitrile including 60 $\mu g \cdot mL^{-1}$ rocuronium bromide and 100 $\mu g \cdot mL^{-1}$ propofol. The external standard solutions were prepared with acetonitrile at a concentration of 60 $\mu g \cdot mL^{-1}$ for rocuronium bromide and at a concentration of 100 $\mu g \cdot mL^{-1}$ for propofol.

Standard propofol peak height with a standard deviation of 0.38 and standard rocuronium bromide peak height with a standard deviation of 0.25 were established. Peak heights of propofol and rocuronium bromide in propofol-rocuronium bromide (5:3) stock solutions were determined at zero, two, four, six, 18, 24, 48 and 72 hr, respectively, in comparison to peak heights of the freshly prepared external standards at the same concentration level. We conclude that a 5:3 mixture of propofol and rocuronium bromide was stable up to 48 hr after mixing. Propofol concentration in the mixtures stored at ambient temperature showed degradation 72 hr after mixing. Propofol concentration in mixtures stored at 37°C showed degradation four hours after mixing.

After Ethic's Committee approval and patient written informed consent, 35 patients, ASA class I–II, undergoing elective surgery were included in this study. All patients received fentanyl 1 $\mu g \cdot kg^{-1}$ followed by three minutes of preoxygenation. Anesthesia was then induced with the propofol (2 $mg \cdot kg^{-1}$) - rocuronium (0.6 $mg \cdot kg^{-1}$) mixture *iv* over 30 sec. All patients were intubated on the first attempt. The intubating conditions were evaluated using a score described by Viby-Mogensen.[5] Intubating conditions at 60 sec were determined as excellent in 26 patients and good in nine patients. We have not determined any adverse effect of this mixture.

We concluded that anesthesia induction with a propofol-rocuronium mixture provides excellent or good intubating conditions at 60 sec. It could be an effective and alternative technique for rapid induction of anesthesia.

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Streptococcal meningitis after spinal anesthesia: report of a case

To the Editor:

A 66 yr-old male underwent uneventful spinal anesthesia for right inguinal herniorhaphy. He had been taking medication for coronary arterial disease and hypertension.

During induction of spinal anesthesia the puncture site was found to be normal and sterilized with Povidon iodine (PI; Merkez Laboratuarlari Ilac San, Istanbul, Turkey). A sterile dressing pack and disposable needles

and syringes were used. A 25-gauge Quincke disposable spinal needle (Spinocan, Braun Melsungen AG, Germany) was inserted into the L4–5 spinal space and 10 mg hyperbaric bupivacaine and 10 μg fentanyl were injected into the subarachnoid space. A satisfactory spinal block was achieved. One day after surgery, the patient complained of nausea, vomiting, fever and somnolence. On neurologic examination and laboratory testing, lethargy, suspect nuchal rigitidy, a body temperature of 38°C and a leukocyte count of 18.000 mm^{-3} were observed. Analysis of cerebrospinal fluid (CSF) indicated leukocytosis, increased protein level and decreased glucose. Soon after blood and CSF cultures were obtained, empirical therapy including vancomycin and ceftazidime was started. The causative agent was identified as Streptococcus salivarius by CSF culture. On the third day of treatment, the patient regained consciousness.

Bacterial meningitis is a rare but serious complication of spinal anaesthesia.[1] Veringa *et al.*[2] reported a case of meningitis caused by Streptococcus salivarius that occurred iatrogenically after lumbar puncture. They identified the source of infection by isolating the same bacteria from the throat of the neurologist.

Bacteria can reach the CSF by two different routes. First, bacteria present in the patient's blood at the time of lumbar puncture may gain access to the subarachnoid space. Second, a break in aseptic technique could result in the introduction of exogenous organisms into the CSF. In our case there were no signs of bacteremia. In addition, anesthesiologists who perform regional anesthesia always wear a cap, face mask and sterile gloves, clean the skin with PI, and use sterile needles and drugs. In this case, the only possibility of a breech in aseptic technique relates to the multiple-use of PI solution. Birnbach *et al.*[3] claim that PI may become contaminated with multiple use and that it is less effective than PI from previously unopened bottles. On the other hand, multiple-use PI solution for asepsis has been in use at our institution with no adverse effect. Ezri *et al.*[4] reported that bacterial meningitis after spinal anesthesia can occur without any apparent risk factors.

In conclusion, it is important to consider bacterial meningitis after spinal anesthesia despite the lack of apparent causative factors. In the case presented, contamination possibly resulted from disinfection with multiple-use PI solution.

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