26449 - MINIMUM EFFECTIVE DOSE OF REMIFENTANIL FOR PEDIATRIC LUMBAR PUNCTURE

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INTRODUCTION: The administration of propofol for lumbar puncture (LP) is common in pediatric oncology patients. Propofol has no analgesic properties, and as a result patients often respond to the pain of LP needle insertion. Also, propofol may produce myoclonic movements that can make the procedure more difficult to perform. Remifentanyl is an ultra-short acting opioid which can be used to provide analgesia and sedation for short painful procedures with minimal residual pain. The combination of propofol and remifentanyl may be particularly suitable for short duration procedures. The purpose of this study was to determine the minimum effective dose of remifentanyl required to prevent movement during LP when co-administered with propofol 2.0 or 4.0 mg/kg (P2 or P4).

METHODS: After obtaining REB approval, 24 unpremedicated children aged 3-11 years undergoing elective LP have been studied to date. No topical anesthetic cream was applied to the skin over the lumbar region. Patients were randomly assigned to group P2 or P4 using a random number table. Anesthesia was induced with propofol followed immediately by remifentanyl. The initial dose of remifentanyl in each group was 1.0 µg/kg in group P2 and 0.5 µg/kg in group P4. Subsequent doses of remifentanyl were determined by the Dixon up-and-down method using a dose interval of 0.25 µg/kg.¹ The LP needle was introduced at 90 seconds after propofol administration. Patients were given a rescue bolus of propofol 1.0 mg/kg if required. Occurrence of purposeful movement, duration of procedure, duration of apnea, and episodes of bradycardia or hypotension were recorded.

RESULTS: Patient age, weight, and duration of procedure are shown in the table. Using the Dixon up-and-down method, our preliminary data suggest that the minimum effective dose of remifentanyl that prevents movement when co-administered with propofol 2.0 mg/kg and 4.0 mg/kg is 1.00 ± 0.19 µg/kg and 0.46 ± 0.19 µg/kg, respectively. The duration of apnea for patients who did not move was 56 ± 21 s in group P2 and 49 ± 38 s in group P4. There were no episodes of bradycardia or hypotension in either group.

DISCUSSION: Preliminary data suggest that the administration of propofol and remifentanyl provides effective anesthesia for pediatric patients undergoing LP. Minimum effective doses of remifentanyl when used in combination with propofol 2 and 4 mg/kg are 1.00 ± 0.19 µg/kg and 0.46 ± 0.19 µg/kg, respectively.

REFERENCES: 1. Statistics in Endocrinology. Cambridge, Massachusetts: MIT Press, 1970: 251-267.

	Propofol 2 mg/kg	Propofol 4 mg/kg
Age (yr)	5.3 ± 1.4	5.2 ± 2.7
Weight (kg)	19.1 ± 4.4	21.3 ± 7.7
Duration of procedure (s)	222 ± 42	211 ± 49
Minimum effective dose of remifentanyl (µg/kg)	1.00 ± 0.19	0.46 ± 0.19
Duration of apnea (s)	56 ± 21	49 ± 38