

Premedication with intranasal dexmedetomidine decreases barbiturate requirement in pediatric patients sedated for magnetic resonance imaging: a retrospective study

Panu Uusalo (✉ pijuus@utu.fi)

Department of Anaesthesiology and Intensive Care, University of Turku, Turku, Finland and Division of Perioperative Services, Intensive Care and Pain Medicine, Turku University Hospital, Turku, Finland
<https://orcid.org/0000-0001-5120-8854>

Mirjam Lehtinen

Department of Anaesthesiology and Intensive Care, University of Turku, Turku, Finland

Eliisa Löyttyniemi

Department of Biostatistics, University of Turku, Turku, Finland

Tuula Manner

Department of Anaesthesiology and Intensive Care, University of Turku, Turku, Finland and Division of Perioperative Services, Intensive Care and Pain Medicine, Turku University Hospital, Turku, Finland

Mika Scheinin

Institute of Biomedicine, University of Turku, and Unit of Clinical Pharmacology, Turku University Hospital, Turku, Finland

Teijo I. Saari

Department of Anaesthesiology and Intensive Care, University of Turku, Turku, Finland and Division of Perioperative Services, Intensive Care and Pain Medicine, Turku University Hospital, Turku, Finland

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Abstract

Background: Barbiturates are commonly used in ambulatory sedation of pediatric patients. However, use of barbiturates involve risks of respiratory complications. Dexmedetomidine, a highly selective α_2 -adrenoceptor agonist, is increasingly used for pediatric sedation. Premedication with intranasal (IN) dexmedetomidine offers a non-invasive and efficient possibility to sedate pediatric patients undergoing magnetic resonance imaging (MRI). Our hypothesis was that dexmedetomidine would reduce barbiturate requirements in procedural sedation. **Methods:** We included 200 consecutive pediatric patients undergoing MRI, and analyzed their hospital records retrospectively. Half of the patients received 3 $\mu\text{g}/\text{kg}$ of IN dexmedetomidine (DEX group) 45-60 min before MRI while the rest received only thiopental (THIO group) for procedural sedation. Sedation was maintained with further intravenous thiopental dosing as needed. Thiopental consumption, heart rate (HR) and peripheral oxygen saturation were recorded. **Results:** The cumulative thiopental requirement during MRI was (median and interquartile range [IQR]) 4.4 (2.7-6.0) mg/kg/h in the DEX group and 12.4 (9.8-14.8) mg/kg/h in the THIO group (difference 7.9 mg/kg/h, 95% CI 6.8–8.8, $P < 0.001$). Lowest measured peripheral oxygen saturation remained slightly higher in the DEX group compared to the THIO group (median nadirs and IQR: 97 (95-97) % and 96 (94-97) %, $P < 0.001$). Supplemental oxygen was delivered to 33 % of the patients in the THIO group compared to 2 % in the DEX group ($P < 0.001$). The lowest measured HR (mean and SD) was lower (78 (16) bpm) in the DEX group compared to the THIO group (92 (12) bpm) ($P < 0.001$). **Conclusion:** Premedication with IN dexmedetomidine (3 $\mu\text{g}/\text{kg}$) was associated with markedly reduced thiopental dosage needed for efficient procedural sedation for pediatric MRI.

Figures

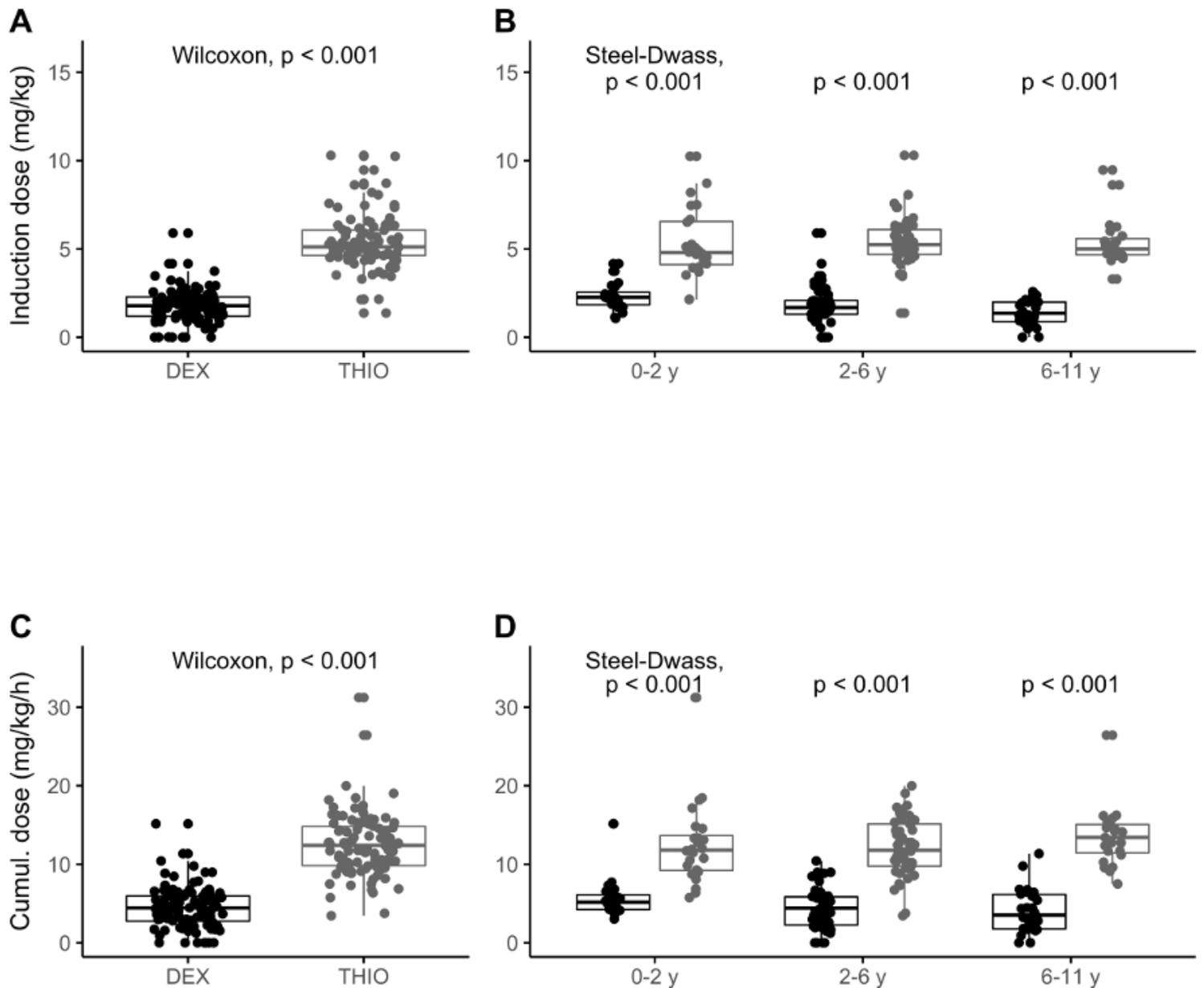


Figure 1

Induction doses and cumulative dosing of thiopental in three clinically relevant age groups. Difference between dexmedetomidine (DEX) and thiopental (TIO) groups was tested with Wilcoxon test for induction dose of thiopental (mg/kg) (A) and for cumulative dose of thiopental (mg/kg/h) (C). Difference in induction dose of thiopental (mg/kg) (B) and cumulative dose of thiopental (mg/kg/h) (D) between three clinically significant age groups of dexmedetomidine group (DEX1, DEX2 and DEX3) and thiopental group (THIO1, THIO2, THIO3) were tested using Kruskal-Wallis test and continued with pairwise comparisons which were corrected with Steel-Dwass method for all pairs.

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