

A308

TITLE: CONTINUOUS IV DEXMEDETOMIDINE INFUSION AS ANESTHETIC ADJUVANT IN HYSTERECTOMY
AUTHORS: M. Aho M, M.D., O. Erkola, M.D., A. Kallio A, M.D., H. Scheinin, M.D., K. Korttila, M.D
AFFILIATION: Women's Hospital, University of Helsinki, SF-00290 Finland

Introduction: Dexmedetomidine (dex), a novel highly selective α_2 -agonist, has sedative effects.¹ A single intravenous bolus given 10 min before the induction of anesthesia, attenuated the hemodynamic response to intubation and decreased the isoflurane requirements during hysterectomy.² I.v. dex has also diminished the need of thiopental during curettage of uterus.³ In experimental animals dex was able to reduce the MAC concentration of isoflurane by over 90%.⁴ The present study evaluated the usefulness of i.v. dex infusion as anesthetic adjuvant in patients undergoing abdominal hysterectomy.

Methods: The study was approved by the Ethical Committee of the Hospital and comprised 34 consenting healthy women. The first part of the study (14 pts) was an open dose-finding study. After the suitable dose level of dex had been determined, the study was continued as a double-blind placebo-controlled trial (20 pts). Prior to the infusion glycopyrrolate 0.2mg was given i.v. Dex was administered as a 2-speed intravenous infusion, which was started 10 min before the induction of anesthesia. In the dose-finding part, the first infusion regimen consisted of a 120ng/kg/min loading dose for 10 min followed by 6ng/kg/min maintenance dose. The loading dose was increased at 50 ng/kg/min increments, and the corresponding increase for the maintenance dose was 2.5ng/kg/min based on pharmacokinetic parameters according to Wagner.⁵ BP (a-line) and HR were recorded at 1 min intervals from 11 min before induction until 10 min after intubation and thereafter at 2 min intervals. Just prior to the induction vecuronium 0.6 mg and fentanyl 1.0 μ g/kg were administered, and at the induction the loading dose was switched to the maintenance dose, which was continued until the fascial closure. Anesthesia was induced with thiopental 4.0mg/kg and succinylcholine was given to facilitate intubation. After intubation vecuronium 3.0 mg was administered and relaxation was maintained at 85% by administering additional 1.0mg doses of vecuronium. Following intubation anesthesia was maintained with N₂O/O₂ (70/30%). 1.0 μ g/kg of fentanyl was given intravenously to all patients 2 min before the first surgical incision. Isoflurane was administered in order to keep MAP in 15% limits of the baseline values and HR in 20 % limits, or if any signs of light anesthesia as e.g. bucking, lacrimation, sweating, or any movement was observed. Isoflurane was started at 0.5% e.t. concentration and if this was insufficient to return BP or HR to acceptable values within 3 min, the concentration was increased in 0.2% steps up to a maximum of 1.9%. Once isoflurane had been taken into use, the e.t. conc. was recorded at 2 min intervals. Student's t-test was used to compare the need of isoflurane and ANCOVA for hemodynamic parameters in the comparative part of the study.

Results: According to the open dose-finding study, loading dose was chosen to be 170ng/kg/min and maintenance dose 10 ng/kg/min, because only slight hemodynamic changes were noticed during the pre-induction time, and the reduction in the need of isoflurane during surgery was still remarkable.

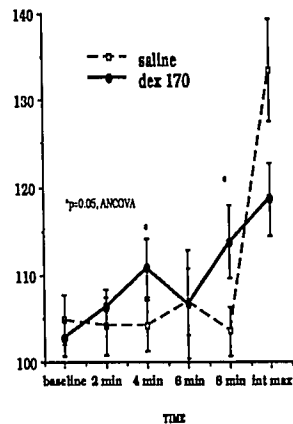
In the comparative part of the study, dex infusion reduced HR and increased mean BP during the loading dose compared to saline. After intubation the maximal increase in HR, but not in blood pressure, was attenuated in the dex group. In the patients treated with dex infusion the reduction in the need of isoflurane during the surgery was about 90 % compared to those treated with saline (p<0.02). In the recovery room there were no differences in the incidence of nausea or vomiting or in the amount of analgesic needed. 4 of 10 patients treated with dex, needed atropine for bradycardia (HR less than 40).

Discussion: Dexmedetomidine infusion attenuated HR response to intubation and reduced the need of isoflurane during the surgery. In the recovery room, dexmedetomidine treated patients needed atropine more often.

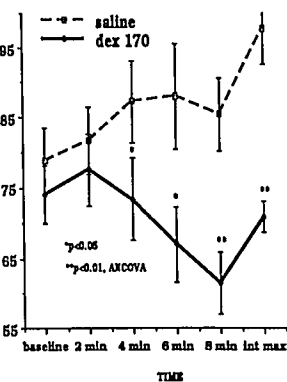
References:

1. Br J Clin Pharmacol 24:443-451,1987
2. Anesth Analg 70:S5, 1990
3. Anesth Analg 70:407-413, 1990
4. Anesth Analg 67:611-615,1988
5. Clin Pharmacol Ther 16:691-700,1974

MEAN BLOOD PRESSURE (mmHg) DURING LOADING



HEART RATE (beats/min) DURING LOADING



A309

TITLE: DEXMEDETOMIDINE REDUCES INTRAOCULAR PRESSURE, INTUBATION RESPONSES AND ANESTHETIC REQUIREMENTS IN OPHTHALMIC SURGERY
AUTHORS: T. Ali-Melkkilä, M.D., M-L. Jaakola, M.D., J. Kanto, M.D., M. Scheinin, M.D., A. Kallio, M.D.

AFFILIATION: Departments of Anesthesiology and Pharmacology, University of Turku, SF-20520 Turku and Orion Corporation, Farmos, R&D, SF-20101 Turku, Finland.

The optimal anesthetic management in ophthalmic surgery should provide low intraocular pressure (IOP), adequate level of anesthesia and cardiovascular stability. Alpha-2-adrenoceptor agonists have been found to reduce intraocular pressure, improve perioperative hemodynamic stability and decrease anesthetic requirement in ophthalmic surgery.¹ We studied the effects of dexmedetomidine (DEX), a new, highly selective and specific alpha-2-adrenoceptor agonist, on IOP, adrenergic hormonal and hemodynamic responses to laryngoscopy and endotracheal intubation and evaluated its effects on anesthetic requirements in patients undergoing elective cataract surgery.

Methods: With written informed consent and Ethics Committee approval, 30 ASA 1-2 patients were randomly and in a double-blind fashion allocated to receive either 0.6 μ g/kg of DEX or placebo i.v. 10 min before induction of anesthesia. Glycopyrrolate 4 μ g/kg was administered prior to induction. Anesthesia was induced with thiopental and maintained with 70/30% N₂O/O₂ supplemented with fentanyl 2 μ g/kg. Pancuronium (0.1 mg/kg) was used as a muscle relaxant before endotracheal intubation. The hemodynamic endpoint of the anesthetic management was to maintain blood pressure (BP) and heart rate (HR) within 20 % limits of the preoperative values. Hypertension or/and tachycardia were treated with isoflurane at 0.5 % increments or with 1 μ g/kg of fentanyl. IOP, HR, BP and plasma catecholamine levels: adrenaline (A), noradrenaline (NA), 3,4,-dihydroxyphenylglycol (DHFG) were recorded at various stages of anesthesia.

Results: The groups were comparable with regard to age, weight, sex and preoperative values of IOP and hemodynamic variables. Before induction of anesthesia DEX was associated with a 34 % (95% confidence interval (CI): 27-43%) reduction in IOP, and 62 % (CI: 57-68%) reduction in plasma norepinephrine (NE) concentrations. Following intubation the maximum HRs were 18% (CI: 3%-33%) and the maximum IOP 27 % (CI: 11-43 %) lower in the DEX group when compared with placebo. DEX reduced the induction dose of thiopental (P<0.05) and the requirement of isoflurane (P<0.05) and/or fentanyl supplementation during anesthesia. The recovery time (response to verbal command after termination of N₂O administration) was shorter in the DEX group (p<0.05).

Discussion: This study demonstrates that DEX may be beneficial as premedication in ophthalmic surgery, because it decreases IOP and attenuates the hemodynamic and sympatho-adrenal responses to laryngoscopy and endotracheal intubation. Furthermore, DEX reduces the requirements of thiopental, fentanyl and isoflurane, and provides faster recovery.

References:

1. Anesthesiology 68:707-716, 1988.
2. Anesthesiology 73:230-235, 1990.