# Dexemedetomidine Use inside Operation theatre- *Case study*

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State of the Art Safety Standards in RA
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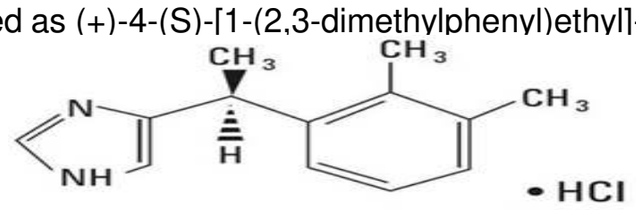
## Background

Anesthesia for short procedures or ambulatory surgery as (awake fiber-optic bronchoscopy, ophthalmic procedures, back injections, awake craniotomy and other minor procedures) has several challenges to an anesthetist. The patient must be sedated to a state where patient can tolerate the surgical procedure, alert responding and co-operative like in awake craniotomy for neurocognitive testing. 1
Adequate anesthesia and analgesia have to be achieved to level that patient is alert, comfortable, responding without pain. The depth of sedation, anxiolysis should be titrated to avoid adverse events as obtunded airway, affection of respiration, high carbon dioxide, coughing, low blood pressure and other hemodynamic abnormalities. 2, 3

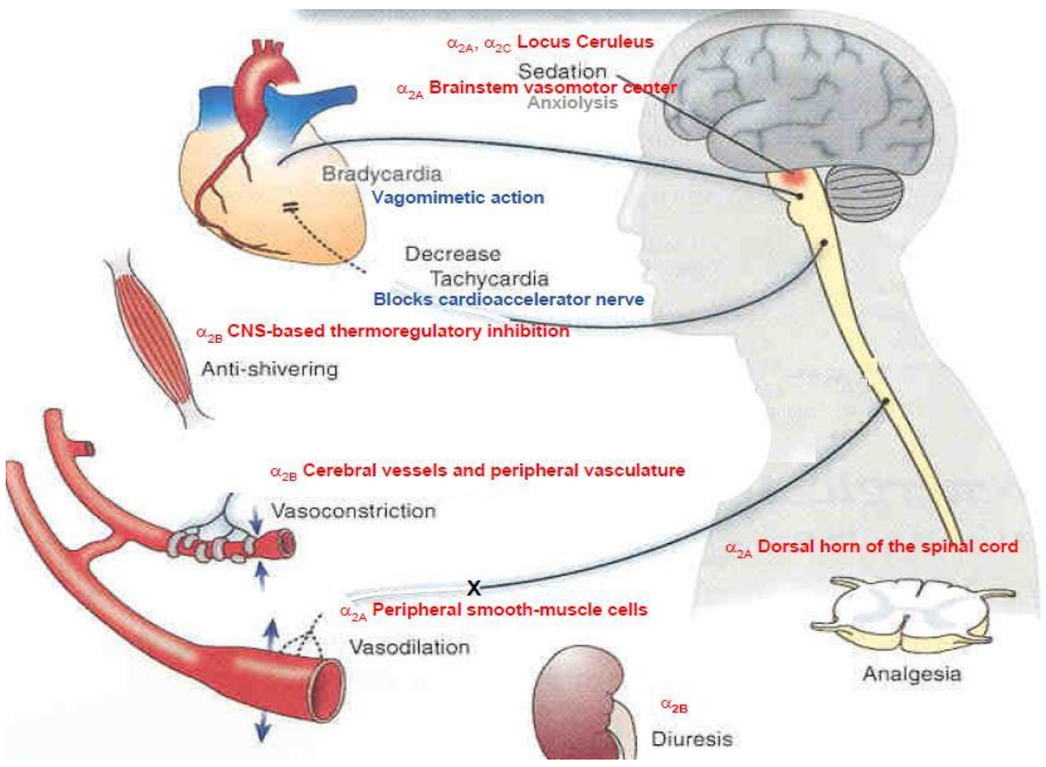
Dexemedetomidine has some characters of ideal anesthetic for perioperative use as rapid start of action and termination with low lipid solubility, easy to give by infusion, achieve a well balanced sedation, can maintain airway reflexes, and less effect on respiration. 4

Now, it has been found that DEX without any known active or toxic metabolites therefore; it is USA Food and Drug Administration (FDA) approved for sedation via IV bolus and continuous administration up to 24 h on intubated patients and for procedural anxiolysis in locations outside the critical care unit (ICU) and operation theatre. 2, 5
Precedex (Dexemedetomidine hydrochloride) in 0 .9% Sodium Chloride Injection is a clear solution tolerable for intravenous injection after dilution.
Dexemedetomidine HCL is the S-isomer of medetomidine and is chemically characterized as (+)-4-(S)-[1-(2,3-dimethylphenyl)ethyl]-1H-imidazole monohydrochloride. 6
Precedex has an empirical formula is $C_{13}H_{16}N_2 \cdot HCl$ and the structural formula is:




Statement of the Problem: *A prospective, randomized clinical trial* (case study) done for procedural sedation in non-intubated patients prior to or during surgical procedures.

** Clinical effects of DEX on various α2 -adrenergic receptors (physiological view). Fig. 3. (18, 19)




## Methodology

- 41 patients of either sex, aged 18 to 60yrs of ASA grade I and II were used as a sample; all adults over 18 years (most surgical patents coming at that time).
- All pediatrics, patients with multiple comorbidities, Patient's refusing; known or admitted alcohol or drug abusers, allergic to the drugs involved in the study and prisoners were excluded.
- 41 Patients were randomized to receive a Loading dose of 0.5 to 1 mcg/kg IV over 10 minutes then maintenance IV infusion in dosage regimen of 0.2 to 0.4 mcg/kg/hour IV, titrate to effect.
- Start loading dosage of 0.5-1 mcg/kg IV over 10 minutes then Maintenance 0.2-0.4 mcg/kg/hour IV titrate to effect.
- 35 patients did not need any midazolam adjuvant as sedative during procedure. Other 6 patients needed only 2mg iv boluses.
- Generally initiate at 0.5-1 mcg/kg over 10 minutes, followed by a maintenance infusion initiated at 0.6 mcg/kg/hour and titrated to achieve desired clinical effect with doses ranging from 0.2 to 1 mcg/kg/hour.

## Results

Research study is *a prospective* case study.
Study was done on adults over 30 years (target population) with total 41 cases in number.

- Precedex administration for sedation of non-intubated patients prior to and/or during surgical and other procedures under monitored anesthesia care was evaluated in randomized clinical trial including safety and efficacy. Precedex in patients undergoing awake fiber-optic intubation prior to a surgical or diagnostic procedure also was included in the study.
- 41 Patients were randomized to receive a Loading dose of 0.5 to 1 mcg/kg IV over 10 minutes then maintenance IV infusion in dosage regimen of 0.2 to 0.4 mcg/kg/hour IV, titrate to effect.
- 11 patients of total 41 cases in the study had marked bradycardia with slow heart rate reached 30 to 40 beats per min and lower blood pressure (systolic blood pressure dropped to 80 to 90 mmHg) on monitor. Other 30 cases got good smooth deep sedation without complications.
- It was found to be noted adverse effect but tolerable controlled not affecting surgery or study outcome.
- It was found that giving rapid bolus over short time can cause rapid affection on heart rate and blood pressure; that's why tapered IV infusion was preferred mode of DEXA administration with good monitoring of vital signs and giving IV fluids with standby pressor agents beside patient.
- Most of patients responded well to IV fluids, pressor agents as ephedrine or phenylephrine with oxygen therapy during procedure.

| Scoring Questionnaire at 24hrs post. Op: | |
|---|---|
| 1. How did you feel Precedex sedation: | Excellent – Good – Fair – Poor |
| 2. Do you think that sedation dosage was less or more: | Needed less- Right amount- Needed more |
| 3. Do you remember anything during procedure / any awareness: | No – Yes |
| 4. Do you remember any events before, during, with recovery from procedure: | Yes- No |
| 5. Any discomfort you got during procedure: | No – Yes |
| 6. Overall, using visual analog scale, where how you rate your satisfaction with sedation? | 0 = complete Dissatisfaction<br>10 = complete Satisfaction |

## Conclusion

Dexemedetomidine is a very useful medication enlisted in the family of drugs used in anesthesia. It can be utilized in a wide range of applications as discussed before at the same time requiring caution during its use. High cost is its limiting factor.
Decreases in heart rate and blood pressure were modest, predictable and well treated. Some patients were arousable, responding to calls. DEX produced good sedation with anxiolysis and lowered need for other sedatives.

## References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