Evaluation of the efficacy of esmolol and Dexmedetomidine on blunting sympathetic stimulation during intracranial procedures.

Asouhidou I, Zosimidis D, Charalampidis D, Katsanevaki A, Patsepas P, Giannaki Ch.

Department of Anesthesia, G.Papanikolaou General Hospital, Thessaloniki, Greece.

Background

Perioperative hemodynamic stability is of utmost importance during intracranial procedures. Elevation of blood pressure can cause bleeding or edema in the operative field, where an elevation of blood pressure during the recovery period is also associated with postoperative hematoma. B-blockers like esmolol, has been used effectively in blocking perioperative hemodynamic changes during intracranial surgery. Dexmedetomidine, a new α_2 -adrenergic agonists which offers sedation and analgesia with no respiratory depression, gains popularity in neuroanesthesia.

This study considers the applicability of these drugs as an adjuvant to neurosurgical case management during fast track anesthesia.

Materials and Methods

Forty-two ASA I-III patients undergoing intracranial tumor or aneurysm surgery were randomly divided in two groups. After induction in anesthesia, group D (n=15) received dexmedetomidine 1 mcg/kg over 10 minutes followed by 0.7mcg/kg/h, where group E (n=15) received esmolol 500mcg/Kg over 5 min following by 300mcg/Kg/min. Bispectral index was used to maintain a similar level of hypnosis in both groups (40-50). The hemodynamic variables at various stages of surgery (HR-heart rate, MAP-Mean arterial pressure), opioids requirements and recovery characteristics were recorded.

Results

There was no episode of hypotension or bradycardia (HR<45/min) in neither group. Emergence from anesthesia was successful in all patients. There were no significant differences between the two groups in extubation times (E=11.7±3.16min and D=12.3min±1.69, p<0.05). The coefficient of variation for MAP did not differ between groups (p>0.05). However HR was lower in the groupD (p<0.05). A significantly smaller proportion of patients in the DEX group required treatment with antihypertensive medications (1 of 21, vs 5 of 21) during the extubation phase. Also, all patients of esmolol group received pre-induction in anesthesia antiemetic therapy, where none patient of Dex group received antiemetic therapy. However none of Dex-group experienced of nausea or vomity.

Discussion

Our study demonstrated that both esmolol and dexmedetomidine could effectively attenuate intraoperative sympathetic overdrive during intracranial procedures. However Dex more effectively prevented the hyperdynamic status throughout the extubation phase.

References

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