Comparison of Sedation with Dexmedetomidine *vs.* Propofol Target Controlled Infusion in Patients Undergoing Hand Surgery Under Brachial Plexus Block

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Introduction. Fear, anxiety and discomfort – these are the negative sensations that are frequently experienced by patients undergoing regional anaesthesia (RA) without sedation. In order to reduce displeasure of being awake during RA, sedation is widely used. The newest sedative in clinical practise is Dexmedetomidine that causes a natural sleep like sedation. The evidence of the use of Dexmedetomidine during RA remains limited. We stated a hypothesis that sedation with Dexmedetomidine is equal to widely used in clinical practice Propofol.

Aim, Material and Methods. The aim of the study was to compare sedations with Dexmedetomidine and Propofol during brachial plexus block. This is a randomised prospective study of two groups of 25 ASA I–II patients. Sedation with Dexmedetomidine was a loading dose of 1 µg/kg over 10 min and an infusion of 0.1–0.6 µg/kg/h until the end of surgery. Sedation with Propofol Target Controlled Infusion maintained Effect Site concentration of 1.8 ± 0.7 µg/ml. Target depth of sedation using Narcotrend EEG monitor was 50–70, Richmond Agitation Sedation Scale (RASS) level was −2 to −3. Sedation was evaluated by answers from questionnaires.

Results. In Dexmedetomidine (D) group mean age of patients was 46.6 ± 15 years, mean BMI – 25 ± 4.3, mean duration of surgery – 81.0 ± 57.8 min. In Propofol (P) group mean age of patients was 52.0 ± 15.0 years, mean BMI – 25.1 ± 4.6, mean duration of surgery – 64.0 ± 33.4 min. After first 10 minutes of sedation, HR decreased from 74.9 ± 10.0 to 62.8 ± 7.9 x/min in group D ($p < 0.01$), but no significant HR decrease in group P was observed. HR was significantly higher in group P throughout sedation 68.6 ± 11.6 vs. 61.3 ± 11.6 x/min ($p < 0.01$). No incidence of bradycardia or hypotension that required treatment was found in either group. Respiratory rate (RR) was similar between groups throughout the sedation. All patients maintained spontaneous breathing, no patient required assisted ventilation. In order to maintain Sp02 over 95% 12/25 (48%) patients in group D and 14/25 (56%) patients in group P required O2 inhalations. In group D, no patients required positional maneuvers or oropharyngeal airway insertion to achieve correct airway, in group P 5/25 (20%) patients required positional maneuvers, 1/25 (5%) required oropharyngeal airway insertion to achieve correct airway. After loading dose, mean Narcotrend EEG index (NI) decreased from 97.3 ± 2.1 to 66.1 ± 25.9 in group D ($p < 0.01$), and from 97.5 ± 3.6 to 61.2 ± 19.5 in group P ($p < 0.01$). At NI, target range of 50–70 patients in group D were waking up from moderate noises and falling back asleep without necessity to increase the dose of Dexmedetomidine, patients in group P were not waking up from similar noises. From questionnaires all patients from both groups were satisfied with sedation.

Conclusions. Patients undergoing sedation for hand surgery were comparable in Dexmedetomidine and Propofol groups, had similar age and BMI. Propofol Target Controlled Infusion sedated patients had statistically significantly higher HR ($p < 0.01$) throughout sedation, no patient in either group had bradycardia or hypotension that required treatment. Respiratory rate was similar in patients undergoing sedation with Dexmedetomidine or Propofol Target Controlled Infusion, all patients maintained spontaneous breathing. To support adequate ventilation, patients sedated with Propofol required O2 inhalations and airway positional maneuvers more frequently than patients sedated with Dexmedetomidine. At the target depth of sedation of 50–70 Narcotrend Index patients sedated with Dexmedetomidine were waking up from moderate noises and falling back asleep with no necessity to increase the dose of Dexmedetomidine. Patients sedated with Propofol Target Controlled Infusion, did not wake up from similar noises.