Title of Abstract: Comparison of Dexmedetomidine and Lidocaine in Preventing Cough During Emergence from General Anaesthesia for Thyroidectomy – A Randomised Controlled Trial

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Background: Coughing is a common clinical problem during emergence from general anaesthesia in the presence of a tracheal tube. Emergence cough may result in hypertension, tachycardia, agitation and rarely, haemorrhage from the surgical wound site. Post-operative neck haematoma requiring emergent surgical evacuation is a rare complication of thyroidectomy with a high mortality. Sudden violent cough, sneeze or vomit during extubation may lead to bleeding. Various methods have been tried to decrease these complications. Among the pharmacological methods used, dexmedetomidine has been successfully used to attenuate coughing and haemodynamic responses to tracheal intubation and extubation, in doses ranging between 0.5 mcg/kg to 1 mcg/kg. Lidocaine has also been used in doses between 1 mg/kg to 2 mg/kg to prevent cough during emergence from general anaesthesia. Studies are not available till date comparing these drugs in preventing cough during emergence from general anaesthesia for thyroidectomy.

Aim: Primary: To compare the effect of Dexmedetomidine and Lidocaine in preventing cough during emergence from general anaesthesia for thyroidectomy. Secondary: a) To compare the effect of Dexmedetomidine and Lidocaine in attenuating haemodynamic responses and b) the time taken to awaken from anaesthesia.

Design: Double Blinded Randomised Control Trial

Methods: IRB approval and patients consent were obtained. All anaesthetic agents and techniques were standardised. The primary investigator, the patient and the treating anaesthesiologist were blinded. Patients were randomised in to two arms, Group A received 1 mcg/kg of Dexmedetomidine over 15 minutes and Group B
received 2 mg/kg bolus of Lidocaine. The infusion was started when the closure of muscle layer started and the bolus was given when the MAC reaches 0.3. Vital signs were recorded at specific time points. Any occurrence of cough during emergence, extubation or at post anaesthesia care unit were recorded. Cough was graded from 1 to 4 (no cough, mild, moderate, severe cough). Propofol was used as a rescue measure for moderate and severe cough. Data collected were entered in Epidata software and analysed using SPSS software. Chi-Square test, paired t test, Mann-Whitney test were used.

**Results:** There were 44 patients in each arm, and they were fairly matched in both the groups. The overall incidence of significant coughing at extubation was 12.5%. Dexmedetomidine group had 88.6% with mild to no cough and 86.4% had no cough or mild cough in Lidocaine group. Dexmedetomidine attenuated haemodynamic response during emergence, extubation and post-extubation better while Lidocaine did not produce any exaggerated hemodynamic responses during emergence, extubation and post-extubation. Average time taken to awaken in Dexmedetomidine group was 5.32 minutes more than in Lidocaine group.

**Conclusion:** Both Dexmedetomidine at 1 mcg/kg and Lidocaine at 2 mg/kg are effective and equal in preventing cough during extubation. Dexmedetomidine significantly attenuates haemodynamic response during emergence compared to Lidocaine. Dexmedetomidine helped to prevent early movement and cough towards the end of the surgery, but lidocaine did not always guarantee this. Dexmedetomidine caused significant delay in awakening compared to Lidocaine. Dexmedetomidine is a useful adjuvant to help in smooth extubation for head and neck surgery where one would want to minimise post-operative bleeding, though there is a slight delay in awakening. Future studies comparing different doses of Dexmedetomidine and Lidocaine with a placebo arm may be needed to ascertain and compare the effect of these drugs in preventing cough during emergence from general anaesthesia in surgeries where bleeding in the postoperative period is detrimental.