

# **The cardiovascular effects of adrenaline-containing local anaesthetic infiltration into the nasal mucosa of patients undergoing endoscopic trans-sphenoidal pituitary surgery: a prospective observational study**

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## **Background**

Local anaesthetic and adrenaline solution is often infiltrated into nasal mucosa prior to endoscopic trans-sphenoidal pituitary surgery to decrease blood loss and reduce postoperative pain. In patients undergoing sinus surgery this has been shown to produce a marked decrease in mean arterial pressure (MAP) 90 s after infiltration<sup>1,2</sup>, although this effect has never been studied using continuous cardiac output measurement.

## **Method**

After ethical approval and consent, 15 patients undergoing endoscopic trans-sphenoidal surgery were recruited. A LiDCOrapid [LiDCO; Cambridge, UK] CO monitor was connected to a radial arterial line and a standard propofol/remifentanyl anaesthetic titrated to a BIS 40 - 55 was given. Cardiovascular indices were monitored for 30 s prior to, and 240 s following the administration of anaesthetic solution (4 ml 4% articaine with 1:200,000 adrenaline) [Septanest, Septodont; Maidstone, UK]. Data analyses were done using SigmaStat v3.11 [Systat Software; San Jose, California]. Data were not normally distributed and so a Mann-Whitney U test with a post-hoc Dunn test were performed.

## **Results**

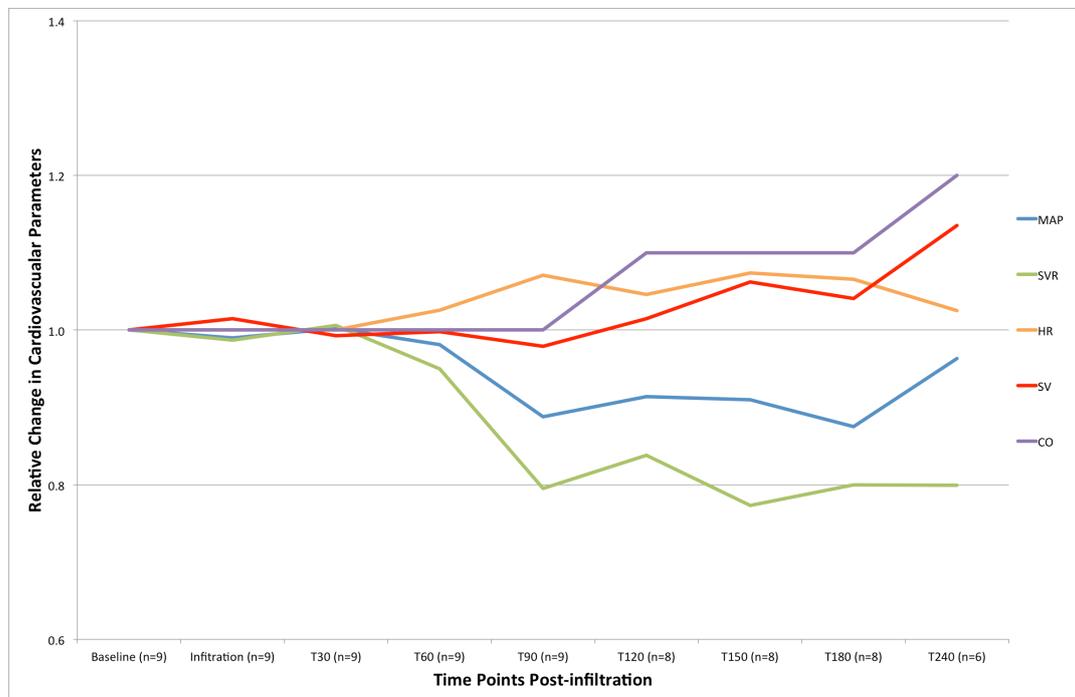
Two patients were excluded as data could not be downloaded, leaving 13 for analysis. Mean (SD) age was 56.5 (16.5) years, with eight being male. A significant drop in MAP [defined *a priori* as >20% from baseline) was seen in nine patients (69.2%) from 90 s post-infiltration; the CVS parameters (systemic vascular resistance, stroke volume, heart rate and cardiac output) of these patients were indexed (baseline assigned as 1) and analysed, with significant deviations from baseline within 240 s following infiltration seen in all parameters ( $P < 0.05$  for all compared to baseline) (Fig. 1).

## **Conclusion**

Nasal infiltration of local anaesthetic and adrenaline solution in patients undergoing endoscopic trans-sphenoidal surgery for pituitary tumours results in a >20% decrease in MAP

in over 50% of cases. Our data suggest this is due to a fall in SVR, possibly due to adrenaline-induced  $\beta_2$ -mediated vasodilatation.

**Figure 1: Changes from baseline in cardiovascular parameters post-infiltration.**



## References

1. Yang JJ, Li WY, Jil Q, et al. Local anesthesia for functional endoscopic sinus surgery employing small volumes of epinephrine-containing solutions of lidocaine produces profound hypotension. *Acta Anaesthesiol Scand.* 2005;49:1471-6.
2. Yang JJ, Zheng J, Liu HJ, et al. Epinephrine infiltration on nasal field causes significant hemodynamic changes: Hypotension episode monitored by impedance-cardiography under general anesthesia. *J Pharm Pharm Sci.* 2006; 9:190–197.