

## **Change in baroreflex sensitivity during induction of anaesthesia with propofol**

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A number of studies have demonstrated that general anaesthesia with propofol results in a decrease in baroreflex sensitivity (BRS), and suggested that this is due to inhibition of sympathetic nervous activity (Ebert *et al.*, 1992, Sellgren *et al.*, 1994). These studies have compared pre-anaesthetic measures with measurements taken following induction, once a steady state of anaesthesia has been achieved. It has not been possible with existing techniques to examine the changes in BRS that occur during induction of anaesthesia, as measurements of BRS require stationarity for spectral measures, long time segments for sequence methods or a steady state at which interventions such as drug infusions can be performed. Kim & Euler (1997) have introduced an alternative method of estimating BRS from spontaneous heart rate and blood pressure fluctuations based on complex demodulation (CMD) that is capable of assessing the dynamic changes in cardiovascular variability and baroreflex sensitivity as a function of time, and does not assume stationarity of the signal.

In the current study we investigated the changes in baroreflex sensitivity that occur during induction of anaesthesia using CMD in 12 healthy male patients undergoing elective surgery. The injection of propofol (10mg/ml)  $0.2\text{ml kg}^{-1}$ , followed by an infusion of  $1\text{ml kg}^{-1}\text{ hr}^{-1}$ , was associated with a transient tachycardia which commenced on average 25 s after the start of propofol injection. The HR reached a mean peak of 95 bpm at 47 s following the start of the injection of propofol and returned towards pre-anaesthetic rates, plateauing by approximately 84 s. The tachycardia occurred approximately 5 s prior to the onset of hypotension. Approximately 30 s following the start of injection of propofol, systolic and diastolic blood pressure fell, followed by a fall in pulse pressure at 34 s. Systolic pressure fell from a mean of 135 mmHg to 97 mmHg by 60 s after the start of the injection of propofol. BRS decreased to a minima at 35-40 seconds after the start of injection of propofol. On average BRS decreased 38% relative to preinduction levels. Following the initial minima, BRS increased, but in 8 of 12 subjects remained below preanaesthetic levels, while in 4 of 12 subjects BRS was elevated.

We conclude that CMD is a useful tool for examining dynamic changes in BRS, such as those occurring at induction of anaesthesia. The hypotension associated with the initial induction of anaesthesia with propofol cannot be accounted for by the brief initial decrease in BRS but may be caused either by intrathoracic pooling of blood, direct myocardial depression or vasodilatation.

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Sellgren, J., Ejnell, H., Elam, M., Ponten, J. & Wallin, B.G. (1994) *Anesthesiology*, 80(3):534-44.