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## CASE REPORT

### BRADYCARDIA FOLLOWING PROPOFOL INDUCTION

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#### ABSTRACT

Propofol has been described as a potent hypnotic drug producing anaesthesia within one arm-brain circulation time, possessing a rapid recovery time and causing minimal postoperative sequelae. It has also been associated with dose-dependent fall in blood pressure on induction with a slightly higher incidence and longer period of post-induction apnea. It may be used for adults before an uncomfortable procedure, to relax and reduce awareness but not cause deep sleep. It is also used to reduce awareness and cause sleep for adults who are being treated in an intensive care unit. Our report of A 48yr old female, weight 55 kg and height 152 cm, posted for excision of fibroadenoma of right breast. Her medical history included high blood pressure, diabetes, and gastroesophageal reflux. Medications on admission included telmisartan, omeprazole, metformin. She was asymptomatic on all these medications. She showed that induction with propofol can cause bradycardia. There are several reports in the literature as well which suggested that how during propofol anaesthesia a low heart rate may occur. The bradycardia may be prevented by premedication with atropine.

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## INTRODUCTION

### Case report

A 48yr old female, weight 55 kg and height 152 cm, with fibroadenoma of right breast posted for excision of the same. Patient was asymptomatic a year back when she noticed a swelling in her right breast which was of a peanut size and freely moving beneath the skin. Over a period of year it increased to assize of 3 x 3 cm and then she visited our hospital and advised for surgery. Her medical history included high blood pressure, diabetes, and gastroesophageal reflux. Medications on admission included Tab. Telmisartan 40mg OD, Tab.Omeprazole DS 20mg OD, Tab. Metformin 500mg OD. She was asymptomatic on all these medications. Hb=11gm%, WBC=7,400/mm<sup>3</sup>, Sr. Creatinine 0.6mg/dl, Total Sr.Bilirubin 0.9mg/dl, Sr.Na 141, Sr.K 4.5,Chest X ray = normal,ECG = normal. After a thorough pre-anaesthetic evaluation patient was planned for General Anaesthesia. Preoperatively heart rate was 72 beats/min regular, arterial blood pressure 130/80 mm Hg, and oxygen saturation between 99 to 100% on room air. Rest of the physical examination was unremarkable. Electrocardiogram, pulse oximeter, and non-invasive blood pressure monitors were attached. Patient given inj. Glycopyrrolate 0.004 mg/kg, inj. Midazolam 0.02 mg/kg and inj. Fentanyl 2 mcg/kg as pre-medications; pre-oxygenation was done with 100% oxygen for 3 minutes.

Patient was induced with propofol 2 mg/kg and size 5 number LMA was introduced without any difficulty. Patient was maintained on spontaneous ventilation with oxygen and nitrous oxide. Before the patient was about to be given the proper surgical position, suddenly the ECG showed a gradual change in the heart rate from 80 beats/min to 30 beats/min. The period of severe bradycardia lasted for approximately 20-25 seconds. Her arterial blood pressure was 144/82 mm Hg, and her oxygen saturation was 100% during this period of time. Patient was given intravenous bolus of atropine, and the heart rate increased to 74 beats/min. Surgery was allowed to continue after a certain period of a vigilant monitoring. Throughout the surgery vitals remained stable, with a heart rate varied between 68 to 88 beats/min, blood pressure from 100/70 to 140/88, and oxygen saturation between 99 to 100% on oxygen and nitrous oxide. The entire surgical procedure lasted for 1 hour and 15 minutes without any other intraoperative complications. The patient was then transferred to the PACU in stable condition. During her 2 hour PACU stay, patient remain stable without any episode of bradycardia. A postoperative cardiology consultation was advised in view of a suspicion of any underline cardiac disorder, which has ruled out of any such cause.

## DISCUSSION

Propofol belongs to a class of medications known as hypnotics or anaesthetics. Hypnotics cause sleep and reduced sensitivity to pain by reducing the movement of pain messages through the nerves. They may cause partial or complete unconsciousness. It is used to induce and maintain sleep as part

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of anesthesia during surgery for adults and children 3 years of age and older. Propofol has been described as a potent hypnotic drug producing anesthesia within one arm-brain circulation time at induction doses of 1.5-2.5 mg/kg, possessing a rapid recovery time and causing minimal postoperative sequelae. Dose-response studies have indicated bolus induction doses of 2.0 mg/kg (deGroot *et al.*, 1985; Coates *et al.*, 1985; deGroot *et al.*, 1985; Mattila and Doski 1985; Fragen *et al.*, 1986) and 2.5 mg/kg, (Goodman *et al.*, 1985; Herbert *et al.*, 1985; Aun and Major 1984; Herbert *et al.*, 1985; Bilaine and Desmouts 1985; Gepts *et al.*, 1985) and maintenance infusion rates of 6-9 mg/kg per hour. (deGroot *et al.*, 1985; Coates *et al.*, 1985; deGroot *et al.*, 1985; Mattila and Doski 1985; Fragen *et al.*, 1986; Goodman *et al.*, 1985; Herbert *et al.*, 1985; Aun and Major 1984; Herbert *et al.*, 1985; Bilaine and Desmouts 1985; Gepts *et al.*, 1985) Some reports suggested a significant dose-dependent fall in blood pressure on induction with propofol. It has also been associated with a slightly higher incidence and longer period of post-induction apnea. It may be used for adults before an uncomfortable procedure, to relax and reduce awareness but not cause deep sleep. This is referred to as conscious sedation. Propofol is also used to reduce awareness and cause sleep for adults who are being treated in an intensive care unit. This reduces awareness of surroundings and thus reduces the stress on the body, allowing recovery. (deGroot *et al.*, 1985; Coates *et al.*, 1985; deGroot *et al.*, 1985; Mattila and Doski 1985; Fragen *et al.*, 1986; Goodman *et al.*, 1985; Herbert *et al.*, 1985; Aun and Major 1984; Herbert *et al.*, 1985; Bilaine and Desmouts 1985; Gepts *et al.*, 1985) Propofol, in comparison with other anaesthetics have specific advantages and favourable kinetics. It has a smooth induction characteristics, with good recovery and less adverse effects. Also it has non-hypnotic therapeutic properties. (Deegan and Propofol 1992; Smith *et al.*, 1994; Borgreat *et al.*, 1994) Our report showed that induction with propofol can cause bradycardia. There are several reports in the literature which suggested that how during propofol anaesthesia a low heart rate may occur despite decreased arterial pressure. (Cullen *et al.*, 1987; Claeys *et al.*, 1988; Egan *et al.*, 1991; Thomson and Yate 1987) In 1987, Cullen, Turtle, Prys-Roberts, Way, Dye J concluded that propofol/nitrous oxide anesthesia is not associated with impairment of baroreflex sensitivity, but that central sympatholytic and/or vagotonic mechanisms enable low heart rates to be sustained despite decreased arterial pressures (Cullen *et al.*, 1987).

In another study, in 1988, Claeys, Gepts, Camu showed that the arterial hypotension associated with the induction and infusion of propofol is mainly a result of a decrease in afterload without compensatory increases in heart rate or cardiac output (Claeys *et al.*, 1988). The mechanism of bradycardia may be caused by depression of sympathetic cardio-accelerator tone. (Krassioukov *et al.*, 1993) In most of the studies many other known factors like drugs or maneuver were also present which could cause or precipitate bradycardia, but in our study we saw that how bradycardia occurred on induction with propofol without interference of any other precipitating factors.

### Conclusion

The important implication arising from this case is that propofol should be used cautiously in patients. The bradycardia may be prevented by premedication with atropine.

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