Use of Propofol (Diprivan) in Diabetic Patients

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Summary

The use of propofol for the induction of Diabetic patients for relatively short surgical interventions was studied. No remarkable cardiovascular problems were noted. The quick clear headed recovery and the relative absence of nausea and vomiting favoured early resumption of feeding and normal daily routine.

Introduction

The interruption of the daily feeding, energy expenditure and insulin/oral hypoglycaemic agent routine of diabetic patients as caused by surgery should be reduced as much as possible. The use of Propofol with its attendant advantages of quick recovery and absence of nausea and vomiting goes some way in achieving this objective. The doubt however arose if the emulsion vehicle of the drug would in some way interfere with control of blood glucose levels.

Diabetic patients suffer several complications which are of importance to the anaesthetist. Vascular disease affecting the peripheries brings the patient to repeated surgery either for vascular reconstruction or for amputation. Adult onset obese diabetics commonly suffer from ischaemic heart disease and are at real risk of suffering a pre-operative myocardial infarction. Diabetic neuropathy affects both peripheral nerves — which may on occasion present as a chronic pain problem — and the autonomic nervous system with the attendant problems of postural hypotension, disturbances of temperature control and reduced sympathetic ‘warning’ responses to hypoglycaemia. Diabetic nephropathy will of course require a careful choice of drugs i.e. those heavily dependent on renal excretion should be avoided. The safety of Propofol in the presence of these problems requires attention.

The Hospital Management Committee’s approval as well as each patient’s verbal consent were obtained. This initial study was made on 25 consecutive diabetic patients scheduled for elective relatively short procedures not involving the abdomen. (These included cataract extractions, debridement of foot gangrene, carpal tunnel release procedures, dilatation and curettage, cystoscopy, excisions of lipomas and lumps in the breast). No other special requirements were chosen for patients to be included in the sample as this study was made to see if any problems would arise in the normal context of a daily surgical list. Pre-medication in most patients included Nitrazepam 5 to 10 mg the night before and Lorazepam 1 to 2 mg on the morning of the operation.

20 were non-insulin dependent and 5 depended on insulin. Those patients which showed uncontrolled blood glucose in the days pre-operatively (the patients hospitalised for lower limb gangrene) were put on a 12 hourly infusion of 5% Dextrose containing plain Insulin according to a scheme often followed in the hospital.

Blood glucose under 200mg% 6 units
over 200 10 units
over 400 20 units

14 were male and 11 were female.

Age groupings:

Under 50 5
Between 50 – 70 17
Over 70 3

If the patient was seen to be anxious on arrival in theatre i.v. Midazolam was titrated to calm him down. Large ante-cubital veins were specially selected to minimise pain on injection which is variably reported to occur. Atropine was given at 0.005mg/kg. Induction was carried out with Propofol at around 10mg/5 seconds using
1.5mg/kg as a guiding dose. Intubation facilitated with Suxamethonium 1mg/kg and Fentanyl up to 0.001 mg was given if necessary. Manually assisted ventilation with nitrous oxide/oxygen and a low concentration of halothane. In 10 patients Pancuronium 0.1mg/kg was used and IPPV with a Manley Pulmovent ventilator. Prostigmine/Atropine in the standard dose of 2.5mg and 1.2mg respectively were used to reverse relaxation at the end of the procedure. Naloxone or Doxapram were not used to hasten recovery.

Monitoring included an ECG, blood pressure by auscultation and capillary blood glucose sampling by Haemoglucotest test strips every 10 – 15 minutes up to 1 hour post-operatively.

Untoward effects at induction, maintenance and recovery were carefully noted.

Results

No patient complained of pain on injection of Propofol. 1.5mg/kg of Propofol was in the majority of cases enough for a smooth induction. Lorazepam and/or Midazolam may of course have helped in lowering the dose of drug needed. In 4 cases mild muscle ‘twitchings’ occurred at induction mainly in the facial and shoulder muscles and lasting less than a minute. Blood pressure and heart rates did not vary more than ± 10% from the baseline obtained before induction.

No unexpected problems occurred during maintenance. Depth of anaesthesia was to a large extent varied by controlling the concentration of Halothane from 0.3 to 1%.

No patient vomited and only 4 patients complained of nausea. These had had fentanyl supplementation.

The blood glucose did show a tendency to rise but this was in keeping with and to the extent usually seen as a normal response to the stress of surgery.

Conclusion

No unexpected untoward events occurred in this pilot series and the anticipated advantages of using Propofol in diabetic patients were to a large extent realised. Most patients had their i.v. infusion removed within an hour of the operation as fluids offered were retained. The infusion was kept going in those cases where blood glucose control needed continued attention.

A controlled study using Propofol as the main anaesthetic both for induction and maintenance, and for longer operations, is needed to further elucidate the problems, if any, associated with the use of a fat emulsion during anaesthesia for diabetics.