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Correspondence

Ketamine tolerance and hallucinations in children

Dr Stevens and Dr Hain have described a case of tolerance to rectal ketamine (*Anaesthesia* 1981; **36:** 1089–93). They discuss the ill understood fact that the dysphoric effects of ketamine are not usually a problem in small children.

I would like to report on a boy aged 3 years who recently underwent radiotherapy for nephroblastoma. He was anaesthetised daily with an intramuscular injection of ketamine, two hours after oral premedication with trimeprazine tartrate 1.7 mg/kg and atropine 0.02 mg/kg as is the current practice in the Royal Aberdeen Children's Hospital for providing anaesthesia for radiotherapy. The development of tolerance to ketamine is a common occurrence in these circumstances the increase in dose required is usually only of the order of 30% to 40%.

The child was anaesthetised successfully on 12 occasions using only 5 mg/kg of ketamine but, on the thirteenth occasion, this dose failed to induce sleep, and about 5 minutes after the injection, he became obviously hallucinated. He held an animated, if one-sided, conversation with several elephants, while reaching out his hands and grasping at the air. He did not appear to lose awareness of his surroundings, and tried to include his somewhat alarmed father in the conversation. He was not distressed but rather he was cheerful, and apparently quite unperturbed by the appearance of elephants in the anaesthetic room. The episode was terminated by the induction of general anaesthesia with halothane and nitrous oxide in oxygen and the radiotherapy proceeded without incident. He recovered consciousness quietly about 10 minutes later with no sign of anxiety. His parents questioned him carefully later, but he had no recollection of anything

All correspondence should be addressed to Dr J.N. Lunn, Editor of *Anaesthesia*, Department of Anaesthetics, The Welsh School of Medicine, Heath Park, Cardiff CF4 4XW, United Kingdom.

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after the injection of ketamine. He denied dreaming.

The induction dose of ketamine was subsequently increased to 7.5 mg/kg, and the trimeprazine tartrate omitted from the premedication. The remaining seven anaesthetics were unremarkable.

This case shows clearly that hallucinations may occur in small children given ketamine. It has been suggested that the lack of reports of dreaming or hallucination in children is due to inability of the child to communicate the experience.[1] In this instance, the boy's parents were in no doubt that this was not the case since he had been able to describe having had nightmares at home.

It is interesting to note that an experience which might have been disturbing to an adult caused a child no distress. Perhaps herein lies a clue to the mystery. The fact that there was amnesia for the experience must also be an important observation.

Department of Anaesthesia, Aberdeen Royal Infirmary, Foresterhill, Aberdeen

FIONA M. MACLENNAN

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Ketamine for the relief of bronchospasm during anaesthesia

We wish to present a recent experience of using ketamine to relieve the bronchospasm developed during induction of anaesthesia in two non-asthmatic patients.

The first patient was a woman aged 35 years scheduled for an emergency laparotomy who had an uncontrollable postpartum haemorrhage. She was not an asthmatic. Her blood pressure was 120/90 mmHg, pulse rate 100 per minute and the lungs were clear. She was given 100% oxygen for about 5 minutes before anaesthesia. Atropine 0.5 mg and thiopentone 250 mg were administered intravenously followed by 100 mg of suxamethonium chloride and she was intubated with a cuffed endotracheal tube; when manual ventilation was attempted, however, resistance to the inflation of the lungs was encountered. Auscultation revealed an extensive wheezing all over the lung fields and ventilation with 100% oxygen was instituted. The patient then began to recover consciousness and 100 mg of ketamine was given intravenously to deepen the anaesthesia. The wheeze completely disappeared after about 5 minutes and inflation of the lungs became easy. Anaesthesia was maintained with 2 litres of oxygen and 4 litres of nitrous oxide per minute supplemented by 0.5% halothane and when the patient recovered from the suxamethonium fazadinium bromide was administered intravenously for muscle relaxation. The wheeze did not recur during the course of anaesthesia. The surgical procedure lasted 1 hour and 30 minutes and muscle relaxation was reversed with 2 mg of neostigmine and 1 mg of atropine. The patient recovered from anaesthesia and the tidal volume was then 380 ml/minute. The lungs were clear and the wheeze was not heard during the rest of the stay in hospital.

The second patient was a woman aged 30 years who had to undergo an elective laparotomy for a malignant ovarian tumour. Her blood pressure was 100/70 mmHg and pulse rate 84 per minute. The pre-anaesthetic evaluation of the patient revealed no abnormality and the relevant investigations were within normal limits. Thirty minutes after premedication with 10 mg of diazepam and 0.5 mg of atropine, anaesthesia was induced with 150 mg of thiopentone, and 45 mg of fazadinium bromide was administered. Manual ventilation with oxygen and nitrous oxide was attempted but there was resistance to inflation of the lungs. Auscultation revealed bilateral wheezing. It was thought that light anaesthesia might be responsible and therefore 15 mg of pentazocine was given intravenously but this did not improve the condition. Aminophylline 250 mg and, later, hydrocortisone 100 mg were administered intravenously to relieve the bronchospasm; neither of these drugs produced the desired effect. Ketamine 50 mg was administered intravenously during this period and a slow response was observed; after about 5 minutes the wheezing had completely disappeared. Anaesthesia was maintained with 2 litres per minute of oxygen and 2 litres per minute of nitrous oxide supplemented by 0.5% halothane. The surgery lasted 1 hour and the muscle relaxant was reversed with 2 mg of neostigmine and 1 mg of atropine. The patient fully recovered from anaesthesia, the tidal volume was 350 ml. The wheezing was not observed again during the rest of the postoperative period. The postoperative X-ray of the chest was normal.

It has been shown that ketamine is a useful anaesthetic agent in asthmatic patients.[1] It has also been demonstrated that the bronchospasm refractory to conventional therapy was eased by the administration of ketamine.[2] It is also interesting that our second patient did not respond satisfactorily to the conventional antispasmodic therapy but that the use of ketamine in this patient was highly effective.

Department of Anaesthesia, A.B.U. Teaching Hospital, Zaria, Nigeria

P. RAJANNA
J. NARAYANA REDDY
P. K. GUPTA

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