USE OF REGIONAL ANAESTHESIA IN A PATIENT WITH ACUTE PORPHYRIA

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SUMMARY

The porphyrias are inherited disorders of haem metabolism, acute attacks of which may be precipitated by anaesthesia, surgery and pregnancy. The principal clinical feature of the disease is an acute neuropathy. A patient with acute intermittent porphyria was given bupivacaine as part of a regional anaesthetic for Caesarean section. The course of anaesthesia was uneventful.

KEY WORDS


Acute intermittent prophyria (AIP) is a rare disorder of haem metabolism, inherited by an autosomal dominant pattern. It is characterized by acute episodes of neuropathy which are precipitated by various factors, including pregnancy [1] and general anaesthesia. However, some authorities recommend that regional anaesthesia should be avoided in these patients [2]. This recommendation is based on the fear of litigation which may arise if the neuropathy worsens after operation. We report on the uneventful use of regional anaesthesia on two occasions in a patient with AIP.

CASE REPORT

First pregnancy

The patient’s first pregnancy in 1984 ended with an intra-uterine death at 32 weeks gestation. Labour was induced with extra-amniotic prostin and maintained with an infusion of syntocinon in 5% glucose. An extradural catheter was sited and analgesia provided by intermittent bolus doses of 0.375% bupivacaine. A second i.v. infusion of 5% glucose was started, as hypoglycaemia is known to precipitate episodes of acute neuropathy in such patients [3]. The infusion regimen was modified to 10% glucose at a slower rate and syntocinon in saline, as the patient developed hyponatraemia (Na 124 mmol litre\(^{-1}\)).

The patient was unable to deliver vaginally and abdominal hysterotomy was performed under general anaesthesia, at the patient’s request. Anaesthesia was induced using the technique described by Allen and Rees [4], with cyclopropane in oxygen, after i.v. morphine 10 mg and droperidol 10 mg. Suxamethonium 100 mg was given to allow rapid intubation of the trachea. Cricoid pressure was applied after the patient lost consciousness. Anaesthesia was maintained with 70% nitrous oxide and relaxation was provided by a further 100-mg dose of suxamethonium.

Anaesthesia and surgery were uneventful and the patient recovered without developing the symptoms of an acute neuropathy. A rudimentary uterine horn was found and excised at the same time. No measurements of urinary porphyrins were made during this admission.

Second pregnancy

Her second confinement occurred 2 years later. She was admitted to hospital at 32 weeks gestation for bed rest and observation, in view of her previous medical and obstetric history. She had been admitted to hospital earlier in the pregnancy with abdominal pain which had settled with i.v. fluids and morphine.

At 35 weeks gestation she again developed
abdominal pain and weakness of her hands, and was treated with i.v. fluids and pethidine. Her urine contained porphobilinogen, uroporphyrin and coproporphyrin. The symptoms persisted until, at 37 weeks gestation, she went into labour spontaneously and was prepared for emergency Caesarean section.

She was given Hartmann's solution 2 litre before hyperbaric 0.5% bupivacaine 2.5 ml was injected intrathecally at the L3-4 space with the patient in the sitting position. She was turned onto her back with 15° left lateral tilt and given oxygen 4 litre min⁻¹ by Hudson mask. Automatic non-invasive arterial pressure and continuous ECG monitoring were used throughout the procedure.

Five minutes later the patient had loss of sensation to pinprick up to a level of T6 bilaterally. Surgery was uneventful and the child was delivered with Apgar scores of 9 at both 1 and 5 min. Syntocinon 10 u was given as a bolus at delivery and a further 10 u given by infusion in 5% glucose. During closure of peritoneum the patient complained of pain and was given two bolus doses of pethidine 25 mg.

Hypotension did not occur during the procedure and no vasopressor drugs were given.

During the immediate recovery period the patient was given an infusion of 5% glucose and pethidine and morphine for pain. The symptoms of abdominal pain which were present before operation persisted for a few days after operation, but resolved gradually over the following 2 weeks, as did the symptoms of weakness in her hands.

**DISCUSSION**

Anaesthesia for Caesarean section remains a challenge. Regional anaesthesia is popular, as it avoids the complications of failed tracheal intubation, aspiration of gastric contents, neonatal depression, maternal awareness and uterine atony [5].

Patients with AIP are at particular risk from general anaesthesia, as most of the i.v. induction agents may induce an episode of neuropathy [6]. Furthermore, as barbiturates are contraindicated and volatile agents should be avoided, the anaesthetist may be using drugs and techniques with which he is unfamiliar. Ketamine and etomidate have been used in patients with AIP [7,8] but there is some animal evidence suggesting that they should be avoided [9,10]. Propofol may be a promising agent for such patients [11], but experience is limited and it has not yet been licensed for use in pregnant women. Enflurane has been shown to be potentially dangerous, the use of halothane is contentious, and experience with isoflurane is limited [12].

The suitability of local anaesthetic agents for use in porphyric patients is determined by clinical experience and data from animal models. Parikh and Moore have developed a rat model which suggests that procaine and bupivacaine are safe agents, but that lignocaine should be avoided [13]. Their study showed that procaine reduced the plasma concentration of delta amino laevulinic acid synthase, and procaine has been reported to have produced remission in a patient with acute porphyria [14]. However, procaine is not used routinely in the treatment of acute episodes of porphyria [15]. Deybach and his colleagues, using a chick embryo model, suggested that procaine was safe, but both lignocaine and bupivacaine could be porphyrinogenic [16]. Extradural procaine and fentanyl have been used during labour in a porphyric patient, who had an uneventful delivery, with no clinical or biochemical evidence of the induction of an acute attack [17].

Although lignocaine should be avoided in porphyric patients, Nakamura, Koide and Takahashi have described its successful use in extradural anaesthesia for Caesarean section [18]. This highlights the problems of interpreting individual case reports in porphyric patients. Exposure to known prophyrinogenic agents does not always produce an acute episode [19], and the outcome of individual case reports must be interpreted in the light of the information from animal models.

Procaine is probably the safest local anaesthetic to use in porphyric patients. Hunton has described its successful use for extradural analgesia in labour [20]. However, most anaesthetists are unfamiliar with its use, and it may not be readily available in an emergency. Although bupivacaine was porphyrinogenic in Deybach's model, it has never been implicated in the induction of an acute attack in man [12].

The use of subarachnoid anaesthesia minimizes the total dose of drug to which the patient is exposed; drugs which appear to be safe can become porphyrinogenic when given in larger doses [10].

The likely causes of the neurological deficit that occurs in AIP have been reviewed recently [3]. It
would appear to be caused by either a deficiency in haem or an increase in delta-amino laevulinic acid synthase, which are directly harmful to nerve tissue. There is no evidence that the use of bupivacaine in a regional anaesthetic technique either precipitates an attack of AIP or is directly harmful to nerve tissue.

In conclusion, regional anaesthesia with bupivacaine is an acceptable technique for Caesarean section in patients with acute intermittent porphyria. There is no evidence to suggest that general anaesthesia is a safer option for porphyric patients.

REFERENCES