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Inadvertent Methylergonovine administration to a newborn: A case report

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ABSTRACT

Previous case reports describe the inadvertent administration of methylergonovine to newborns resulting in rare, life-threatening events including neonatal death. To our knowledge, no case reports exist detailing inadvertent methylergonovine administration in the emergency medicine literature. A newborn infant presented to the emergency department (ED) at hour five of life following methylergonovine administration with periods of apnea and cyanosis. The infant required intubation, mechanical ventilation, and a seven day neonatal intensive care stay. This rare case describes the potential for this error to occur in the community and heightens the vigilance of emergency medicine providers when caring for newborns in their first hours of life.

1. Introduction

1.1. Background

Methylergonovine, an ergot alkaloid, is frequently utilized in the immediate post-partum period for uterine atony and hemorrhage [1]. Available case reports describe the inadvertent administration of methylergonovine to newborns resulting in rare, life-threatening events including neonatal death [1]. The majority of reported errors are discovered in the delivery room shortly following administration with supportive care provided immediately. We report a case of methylergonovine administration to a newborn at a community birthing center. Recently, out-of-hospital planned births have increased [2], a trend that is expected to continue as more expectant mothers wish to avoid the hospital setting in light of the COVID-19 pandemic.

1.2. Case report

A full-term, 40 week female infant presents to the ED at approximately hour five of life following uneventful spontaneous vaginal delivery at a community birthing center. The infant was born to a 22-year old gravida 1, para 0 mother with Apgar scores of 8 at 1 min and 9 at 5 min. No significant perinatal complications were noted. The infant was evaluated as asymptomatic by a midwife prior to discharge home at hour two of life. After discharge, the birthing center discovered a missing vial of methylergonovine 0.2 mg and concluded the infant had received methylergonovine rather than phytonadione intramuscularly (IM) after delivery.

Upon arrival to the ED, the infant was intermittently apneic, unresponsive, with central and peripheral cyanosis. The father reports observing bubbles coming from the infant's mouth but believed that to be normal at the time. Initial vital signs included: temperature of 36.9 °C; pulse 170 beats per minute; blood pressure 92/63 mmHg; oxygen saturation 70% on room air. With mask ventilation, the infant responded well and cyanosis abated, however once ventilation was stopped the infant became apneic and cyanotic again. The infant was successfully intubated with a 3.5 ET tube using direct laryngoscopy.

Initial laboratory testing revealed a leukocyte count of 35,200/mL (15% band forms), blood glucose of 191 mg/dL, and hemoglobin of 16.4 g/dL. As the peripheral white blood cell count was elevated with a bandemia, peripheral blood cultures were drawn and the patient was administered an intravenous bolus of normal saline, 20 mL/kg. The infant was transferred to the neonatal intensive care unit (NICU) for further evaluation and treatment.

Upon arrival to the NICU, the infant was vigorous and attempting to cry and was extubated. The infant was placed on nasal continuous positive airway pressure (NCPAP). The first arterial blood gas obtained in the NICU revealed a mixed metabolic/respiratory acidosis: pH 7.18, PCO2 52 mmHg, HCO3 19.6 mmol/L, PO2 67 mmHg, and base excess

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−9.2 mmol/L. As the infant did have a bandemia with periods of apnea and bradycardia, ampicillin and gentamicin were initiated due to concern of sepsis. A chest radiograph was interpreted as normal. A blood glucose was repeated and was 99 mg/dL, serum electrolytes were within normal limits. Shortly after arrival to the NICU, the infant began having intermittent tonic-clonic activity of all extremities. The infant was administered phenobarbital 20 mg/kg IV and a continuous video EEG was initiated. A therpeutic phenobarbital level of 40 μg/mL was achieved shortly after the initial bolus dose was administered. A continuous EEG was interpreted as abnormal significance III, without seizure activity. Antiepileptic therapy and brain MRI were recommended by the pediatric neurologist. All cultures were negative and antibiotics were discontinued after 48 h. A brain MRI was obtained on NICU day 4 and was interpreted as normal. NCPAP was discontinued on day 4 and the infant was discharged to home on day 7 of life, clinically asymptomatic. At the time of this writing, the infant has been doing well.

2. Discussion

Neonatal death following the inadvertent administration of ergot alkaloids has occurred [3], while others have experienced significant respiratory depression, cyanosis, seizures, hypertonicity, altered splanchnic arterial blood flow, and decreased capillary blood refill [4]. Respiratory depression and ventilation perfusion mismatch are believed to occur as a result of the profound pulmonary vasoconstriction and venoconstriction, secondary to methylergonovine's alpha-adrenergic agonism [5].

The management of methylergonovine toxicity is largely supportive, with an emphasis on supporting the patient's respiratory status as well as preventing seizures. Seizures have been reported in nearly 47% of neonatal ergot toxicity cases and are believed to be a result of direct central nervous system toxicity [5] and cerebral hypoperfusion [6] In our case, the infant required two loading doses and close monitoring of phenobarbital levels over the course of several days. The infant was discharged home on oral phenobarbital therapy with close follow up with pediatric neurology.

3. Conclusion

We describe a case of inadvertent IM administration of methylergonovine to a newborn at a community birthing center. This case describes the potential for this error to occur in the outpatient setting and heightens the vigilance of emergency medicine providers when caring for newborns in their first hours of life.

Declaration of Competing Interest

None.

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