

Are opioids safe for use in obstetric general anaesthesia?

The use of opioids during caesarean section has historically been avoided because of concerns regarding neonatal compromise. There is now more evidence regarding the safety and benefits of opioids in obstetric general anaesthesia, so should opioids be used during induction of anaesthesia for caesarean section?

Introduction

Induction of anaesthesia for the non-parturient patient typically includes the use of opioids to improve intubation conditions and provide initial analgesia for the impending surgical stimuli. More recently, this has expanded to include rapid sequence induction. While opioids have long been integral to pain management for the parturient during labour and the postnatal period, use of opioids during induction of general anaesthesia for caesarean section has historically been avoided to protect the neonate from adverse effects. As more evidence emerges regarding their safety and efficacy, should the use of opioids for induction of general anaesthesia in obstetrics become more routine?

Should opioids be avoided at induction?

The lipid solubility of opioids means that they can readily cross the maternal–placental blood barrier. In combination with the fetus' reduced capabilities for elimination and excretion, this has led to opioids being linked to depression of the newborn's respiratory system and CNS (Karbasy and Derakhshan, 2016), typically expressed in studies as reduced 1- and 5-minute Apgar scores. As a consequence of neonatal respiratory depression, opioid use during delivery has been associated with an increased risk of the neonate requiring airway intervention or admission to neonatal intensive care (White et al, 2019). Other neonatal consequences of opioid use relate to umbilical cord blood gas analysis, whereby higher umbilical artery oxygen tensions have been reported and theorised to indicate impaired oxygen consumption by the fetus (Gin et al, 2000).

Moreover, undesirable maternal outcomes have been reported. Alongside increased rates of failed intubation (Odor et al, 2021), thought to be secondary to the physiological changes of pregnancy, the use of opioids for rapid sequence induction has also been theorised to prolong the return of spontaneous ventilation (Lindsay and Bengler, 2015), presenting additional negative sequelae.

Should opioids be given at induction?

Following the introduction of shorter-acting opioids, such as alfentanil and remifentanil, and subsequent studies into their potential adverse effects on the neonate, evidence suggests that using short-acting or low-dose opioids for induction of anaesthesia in obstetrics not only avoids adverse neonatal outcomes, but may provide some benefits, particularly relating to maternal factors. As effective sympatholytic agents (Odor et al, 2021), opioids are able to obtund the maternal haemodynamic response (and subsequent release of catecholamines) to laryngoscopy and noxious stimuli may cause better uteroplacental perfusion and fetal oxygenation during rapid sequence induction of the parturient (Karbasy and Derakhshan, 2016).

Furthermore, the ability to attenuate arousal to high intensity stimuli may theoretically help to reduce the risk of anaesthesia awareness under general anaesthesia. This has a higher incidence and is of greater concern in obstetric populations, as demonstrated in the 5th National Audit Project in the UK and Ireland (Pandit et al, 2014).

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Following the historical concern regarding neonatal neuronal and respiratory depression, newer and shorter-acting opioids, such as alfentanil and remifentanil, have been reported to have no effect on neonatal outcomes (White et al, 2019). In addition, Karbasy and Derakhshan (2016) found no significant effect on the Apgar scores and outcomes of neonates following parturient rapid sequence induction with fentanyl at a maximal dose of 1 mcg/kg, given 2 minutes before induction.

Conclusions

In spite of historical recommendations to avoid opioids during induction of general anaesthesia for caesarean section, given their associated adverse outcomes for the neonate, more recent evidence suggests that the use of shorter-acting or low-dose opioids is not only safe for general anaesthesia for caesarean section, but may be beneficial for the parturient woman and neonate.

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