# Should anaesthetists routinely give dexamethasone as a perioperative antiemetic?

Use of dexamethasone was traditionally confined to chemotherapy-induced nausea and vomiting, but it is now commonly used in the perioperative setting by anaesthetists, both for its antiemetic properties and its ability to reduce airway swelling. Dexamethasone is a synthetic glucocorticoid which is 25 times more potent than hydrocortisone. As well as its immunosuppressive and anti-inflammatory properties, there is concern that the potential for hyperglycaemia and development of insulin resistance postoperatively may increase morbidity and mortality.

## The case for dexamethasone

Avoidance of postoperative nausea and vomiting is important as it is one of the side effects of surgery most feared by patients and can be severely incapacitating. Interruption of oral analgesia caused by postoperative nausea and vomiting can cause significant problems with analgesia. For patients at both moderate and severe risk of postoperative nausea and vomiting, dexamethasone is recommended for use at induction of anaesthesia by the Enhanced Recovery After Surgery programme (NHS Institute for Innovation and Improvement, 2008). The exact mechanism for the antiemetic effect of dexamethasone is poorly understood, but dexamethasone works synergistically with 5HT receptor antagonists to enhance the overall antiemetic effect following a general anaesthetic, or a spinal with concurrent opiates.

Dexamethasone also has analgesic benefits. In a meta-analysis of dexamethasone's effect on postoperative analgesia, patients receiving dexamethasone had less postoperative pain, required fewer postoperative opioids, had longer time to first analgesic dose, needed less rescue analgesia, and had shorter post-anaesthetic care unit stays (Waldron et al, 2013). The addition of dexamethasone to local anaesthetic mixtures for regional blockade helps to prolong their analgesic effects (Desmet et al, 2013).

Dexamethasone used for antiemesis has the added benefit of providing 'steroid cover' for patients requiring a general anaesthetic while they are on steroids for adrenal insufficiency or their long-term anti-inflammatory effects (rheumatoid arthritis). The anti-inflammatory effects are also beneficial in reducing potential airway oedema and obstruction or stridor post extubation, particularly in the paediatric population (Malhotra et al, 2009).

## The case against dexamethasone

The mean prevalence of diabetes in all hospitalized inpatients is 15% (NHS Diabetes, 2013). The potent glucocorticoid activity of dexamethasone is associated with an increased risk of developing insulin resistance, and hyperglycaemia. A single dose of dexamethasone in the perioperative period raises blood glucose levels (Dieleman et al, 2012), but the potential impact of this is not known. Perioperative glycaemic control is linked to postoperative outcomes, with high glucose levels associated with poor outcomes. Furthermore, data suggest that there is an increased risk of mortality in those with poor postoperative glycaemic control, with the highest risk in those not previously known to have diabetes (Frisch et al, 2010).

Additionally, dexamethasone should be used with caution in patients with known malignancy. If given to a patient with a high grade, large volume tumour, it may precipitate tumour lysis syndrome. The lysis of the tumour causes a severe metabolic disturbance secondary to the release of the breakdown products. The immunomodulatory effects of dexamethasone also impair the action of natural killer cells, which have a role in the response to malignancy, therefore theoretically worsening the tumour prognosis.

Dexamethasone has weak mineralocorticoid activity which can lead to sodium retention and potassium excretion. This may contribute to excessive postoperative water retention (putting any surgical anastomosis at increased risk). It can also cause perineal irritation when given intravenously.

## Conclusions

Dexamethasone has been used for many years as a proven antiemetic, and is incorporated into many protocols for the routine prevention of postoperative nausea and vomiting. It is also the drug of choice to treat or prevent airway oedema. However, emerging evidence suggests that dexamethasone has the potential to worsen postoperative outcomes by causing a short-term rise in blood glucose levels. Anaesthetists should question whether the benefits of administering corticosteroids outweigh the potential side effects of transient hyperglycaemia, and ensure that patients are not being harmed by the use of what has always been deemed to be a 'safe' drug. **BJHM**

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