Should non-steroidal anti-inflammatory drugs be given to neurosurgical patients?

Non-steroidal anti-inflammatory drugs (NSAIDs) feature prominently in the armoury for treating postoperative pain. Importantly, they help to reduce the necessity for, and hence the side effects of, opioid analgesics.

The most common opiate-related side effects, i.e. sedation, respiratory depression, and nausea and vomiting, are particularly undesirable in patients following neurosurgical procedures in whom both a rapid, postoperative assessment of neurological status, and tight physiological control of intracranial pressure are warranted.

The routine administration of NSAIDs in neurosurgical patients is not common practice among neuroanaesthetists, primarily because of a concern about the antiplatelet effects of these drugs. NSAIDs cause a prolongation of bleeding time and, as such, may increase perioperative bleeding. Any haemorrhage after major surgery is undesirable, but it is particularly concerning following intracranial surgery where postoperative haematomas carry a high risk of morbidity and mortality. The overall risk of using NSAIDs in this setting remains unclear.

The case for NSAIDs

NSAIDs undoubtedly reduce pain intensity, improve postoperative analgesia and have a sparing effect on morphine consumption. As shown by the meta-analysis by Marret et al (2005), these drugs are also associated with a reduction in the side effects of morphine: nausea is reduced by 12%, vomiting by 32% and sedation by 29%. Despite the fact that there are numerous studies demonstrating platelet dysfunction after the administration of NSAIDs, there are no prospective randomized controlled trials linking NSAIDs causally to postoperative bleeding following neurosurgical procedures.

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The case against NSAIDs

In 1994, Palmer et al conducted a retrospective study of 6668 patients who had undergone neurosurgical procedures, to examine the incidence of, and risk factors associated with, postoperative haematoma formation. This study reported a 1.1% incidence of haematoma. Within this group, the prior administration of antiplatelet agents (aspirin and NSAIDs) was the most commonly associated risk factor for the development of the haematoma. The devastating consequences of suffering a postoperative haematoma were also highlighted by this paper: 55% of patients with this complication either died or were severely disabled at 6 months after surgery.

Although newer NSAIDs, the selective cyclo-oxygenase-2 (COX-2) inhibitors have the advantage of causing less platelet dysfunction and bleeding as a result of the absence of the COX-2 isoenzyme in platelets (Hegi et al, 2004), these drugs have attracted unprecedented publicity because of theoretical concerns about a possible increase in cardiovascular adverse events. Two of these agents have been withdrawn from the market, and as a result, enthusiasm for the use of the available selective COX-2 inhibitors has been dampened. One may also argue that the availability of intravenous paracetamol which too has opiate-sparing effects (Remy et al, 2005) without antiplatelet activity has reduced the need to use NSAIDs following neurosurgery.

The compromise

The question as to whether to administer NSAIDs probably lies in the timing of administration in relation to surgery; when is it safe to do so?

In a retrospective study by Taylor et al (1995), of 2305 patients undergoing intracranial procedures, there was a 2.2% incidence of postoperative haematoma. Of these over 90% clinically deteriorated within 6 hours of surgery representing continued active bleeding at the operation site. In these first 6 hours, NSAID administration may be hazardous; however, one could also argue that, after this period, the risk of giving a NSAID is minimal if the patient has been neurologically stable.

Conclusions

A recent survey (Sebastian and Hunt, 2006) found that there is no consensus about the use of NSAIDs following intracranial surgery among the 36 neurosurgical centres in the UK and Ireland. Although over two thirds of centres do not use NSAIDs routinely, in the remaining centres that do, 54% administered these drugs either intraoperatively or immediately following the procedure.

In the absence of further evidence from a prospective randomized controlled clinical trial, the question of use of NSAIDs following neurosurgery remains open to debate, but their use after 6 hours may be a reasonable compromise. **BJHM**

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