INVITED COMMENTARY

Clonidine in paediatric anaesthesia

Martin Jöhr

Clonidine is an α2-agonist which, in the past, was primarily used in adults as an anti-hypertensive agent, an indication for which it is rarely used today. Since the early 1990s, clonidine has become increasingly popular with paediatric anaesthetists as a sedative agent, as an additive to neuraxial and peripheral nerve blocks, for miscellaneous indications such as the prevention of post-operative agitation and for the treatment of post-operative shivering. Although in adults clonidine is used primarily to achieve haemodynamic stability and a blunted stress response, in children the primary focus is on the quality of recovery from anaesthesia. In both groups, clonidine is used for prolongation of a regional block. A considerable amount of clinical experience with the compound now exists in both adults and children.

Pre-medication with midazolam may reduce separation and induction anxiety, but it has no clear benefit in the early recovery period. Later in the post-operative course there may be some beneficial behavioural effects, but despite this, its failure to improve the emergence period has recently led to its value as a routine pre-medicant for paediatric patients being challenged. To some extent clonidine offers advantages as an alternative in this role, prompting a recent meta-analysis enthusiastically entitled "premedication with clonidine is superior to benzodiazepines." This is certainly correct regarding its effects in the recovery period, but data are less supportive concerning the quality of induction of anaesthesia. Only two articles are included in this meta-analysis: in one, the quality of induction was clearly less satisfactory with clonidine, and in the second, a steal-induction combined with parental presence was feasible and led to a high degree of satisfaction. Anxiety at the time of separation from the parents and at mask induction was reported to be higher with clonidine compared with midazolam. In addition, the subjective experience of a child treated with clonidine has not yet been studied in detail. In adults, pre-medication with clonidine causes unpleasant side-effects such as a dry mouth, and every third patient would prefer not to receive the same pre-medication again.

From the clinician’s point of view, clonidine can be a useful pre-medicant, achieving a good quality of induction in most patients, provided that the slow onset of sedation is acceptable and the ambience is sufficiently peaceful to permit steal-induction. Standard operating procedures have to be adapted when an institution switches from midazolam to clonidine pre-medication.

The prerequisite for a quiet and peaceful recovery is perfect analgesia. However, even in the pain-free child, emergence agitation, which often fulfils the criteria for delirium, does occur. Various compounds have proven to be efficient in its prevention, for example opioids, ketamine, propofol and, most importantly, clonidine. For the prevention of emergence agitation, clonidine can be administered orally or rectally, as well as during anaesthesia by the intravenous or caudal route.

The addition of clonidine to local anaesthetics has the advantage that the duration of caudal spinal peripheral nerve blocks can be prolonged. Systemic clonidine medication reduces the anaesthetic requirement and also enhances post-operative analgesia. In paediatric patients, the duration of caudal block is much the same irrespective of whether clonidine has been given by intravenous or caudal administration. Preference should probably be given to the caudal route, because a specific segmental neuraxial effect of clonidine has been shown convincingly.

The optimal dose of clonidine is largely unknown; in one study, caudal clonidine 3 μg kg−1 resulted in a zero incidence of emergence agitation, but at this dose haemodynamic side-effects can occur. In this issue of the European Journal of Anaesthesiology, Ghosh et al. show that the addition of a smaller dose of clonidine, 1 μg kg−1, to caudal bupivacaine 0.25%, is enough to significantly reduce the incidence of emergence agitation.

Clinicians often feel that it is difficult to reproduce these excellent research results with clonidine in their

This Invited Commentary accompanies the following article:

daily practice. This may be explained by the fact that most studies included only motor aspects (movement, agitation and posture) in the scoring system for measuring emergence agitation, whereas the most obvious and disturbing clinical aspect, inconsolable crying, was not evaluated.

Already today, the α2-agonist clonidine is of great benefit and is widely used in paediatric anaesthesia, especially for improving the quality of recovery. It can also be used to help achieve peaceful induction, but the results in this regard are less persuasive. In the future, the role of combinations (e.g. with benzodiazepines) to improve the quality of induction, the optimal dosing, the subjective experience of the children, as well as the role of newer and shorter acting α2-agonists has to be elucidated. There is still a long way to go.

Acknowledgements
The author would like to thank Professor Thomas M. Berger for his help in editing the manuscript.

Financial support and sponsorship: none.

Conflict of interest: none.

This article was checked and accepted by the Editors, but was not sent for external peer-review.

References