Co-operation with pre-operative cardiovascular monitoring amongst children for chair dental general anaesthesia

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ABSTRACT

INTRODUCTION The Association of Anaesthetists of Great Britain and Ireland (AAGBI) guidelines *Recommendations for standards of monitoring during anaesthesia and recovery* state that cardiovascular monitoring for induction of general anaesthesia should include pulse oximetry and non-invasive blood pressure measurement, but recognise that young patients may not co-operate sufficiently to allow this. The aim of this study was to look at levels of compliance possible for pulse oximetry and non-invasive blood pressure measurement, in a population known to be unco-operative with therapeutic interventions.

PATIENTS AND METHODS A retrospective review of 500 records of patients attending for chair dental general anaesthesia was carried out. It was recorded whether pre-operatively pulse oximetry and non-invasive blood pressure measurement had been allowed in addition to the child's age and sex.

RESULTS Of the children, 52% were male and 48% were female. The age range was 2–15 years. Overall, 448 children co-operated with both pulse oximetry and non-invasive blood pressure measurement. Co-operation appeared to increase with increasing age.

DISCUSSION Of the children, 90% were co-operative with pre-operative monitoring. It could easily be assumed that many of these children, who are referred for general anaesthesia because they are less co-operative than their peers, would not allow proper pre-operative cardiovascular monitoring. This does not appear to be the case.

CONCLUSIONS The majority of children, including the very young, attending for chair dental general anaesthesia, will co-operate sufficiently to allow cardiovascular monitoring during induction of anaesthesia, even though the majority will not tolerate exodontia under local anaesthesia.

KEYWORDS

General anaesthesia – Monitoring – Paediatrics

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The Association of Anaesthetists of Great Britain and Ireland (AAGBI) regard it as essential that a minimum standard of monitoring must be used whenever a patient is anaesthetised. The current AAGBI guidelines entitled *Recommendations for standards of monitoring during anaesthesia and recovery* state that when co-operation allows, monitoring should routinely include pulse oximetry and non-invasive blood pressure measurement (NIBP). These monitors should be attached before the induction of anaesthesia and continued during the 'initial recovery period'. They recognise that during the induction of anaesthesia in children (and in unco-operative adults) it may not be possible to attach all monitoring prior to induction.¹

Current Royal College of Anaesthetists and General Dental Council guidelines restrict the use of general anaesthesia in dentistry. These state that there are three indications for the provision of general anaesthesia in the paediatric patient:

1. Patients in whom it would be impossible to achieve adequate local analgesia and so complete treatment without pain.
2. Patients who, because of problems related to age/maturity or physical/mental disability are unlikely to allow safe completion of treatment.
3. Patients in whom long-term dental phobia will be induced or prolonged.²

Figure 1 Age distribution of children.

Following a departmental audit carried out in 2003, we found that 94% of the children attending for exodontia under chair dental general anaesthesia at Liverpool University Dental Hospital did so because they were deemed to be insufficiently mature to co-operate with treatment under local analgesia.

In order to comply with the AAGBI monitoring guidelines, we routinely aim to initiate cardiovascular monitoring and obtain baseline values prior to induction of chair dental general anaesthesia. For those children who refuse to allow this, we attach the monitors once they are unconscious and document this in their records.

The aim of this study was to look at levels of pre-operative co-operation with pulse oximetry and non-invasive blood pressure measurement, in a population known to be unco-operative with therapeutic interventions.

Patients and Methods

The records of 500 children who had most recently attended for chair dental general anaesthesia at Liverpool University Dental Hospital in 2003 were reviewed retrospectively. It was recorded whether pre-operative pulse oximetry and

Table 1 Co-operation with monitoring

Monitoring technique	Number of patients
NIBP and pulse oximetry	448
NIBP	492
Pulse oximetry	496

non invasive blood pressure measurement had been allowed in addition to the child's age and sex.

Results

Of the children, 52% were male and 48% were female. The age range was 2–15 years. The age distribution is shown in Figure 1. We found that 448 children co-operated with both pulse oximetry and non-invasive blood pressure measurement, with only 52 refusing either or both of these monitoring techniques (Table 1). Of pre-school children (age 2–4 years), 77% were co-operative compared with 96% of primary school age (age 5–12 years) and 100% of teenagers (13–15 years). The 2-year-old age group was the least compliant with 71% allowing monitoring. Co-operation improved with increasing age as shown in Figure 2.

Discussion

The 500 children seen for exodontia under general anaesthesia exhibited a high degree of co-operation with pre-operative monitoring with 90% being fully co-operative. It could easily be assumed that many of these children, who are referred for general anaesthesia because they are less co-operative with dental treatment (than their peers), would not allow pre-operative cardiovascular

Figure 2 Incidence of co-operation at different ages.

monitoring. This does not appear to be the case and we were unable to extrapolate the reason(s) for this from our study. The degree of co-operation improved with increasing age but was high even amongst pre-school children. We had thought that pulse oximetry might be better tolerated than blood pressure measurement as it may appear less threatening. However, there appeared to be little difference in acceptability.

Conclusions

The majority of children, including the very young, attending for chair dental general anaesthesia, will co-operate sufficiently to allow cardiovascular monitoring during induction of anaesthesia, even though the majority

will not tolerate exodontia under local anaesthesia. Thus, it appears that the AAGBI guidelines are achievable for the majority of children presenting for chair dental general anaesthesia. It is important that practitioners do not assume that poor co-operation with dental treatment automatically means that co-operation with other aspects of health care, including monitoring, will be poor.

References

1. Association of Anaesthetists of Great Britain and Ireland. *Recommendations for standards of monitoring during anaesthesia and recovery*. London: Association of Anaesthetists of Great Britain and Ireland, 2000.
2. The Royal College of Anaesthetists. *Standards and Guidelines for General Anaesthesia for Dentistry*. London: The Royal College of Anaesthetists, 1999.

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In the January 2006 issue of the *Annals*, we published the abstracts of the successful applicants for research fellowships. This month we have taken the decision to publish online the abstracts of those who did not receive a fellowship. To view them please visit <http://dx.doi.org/10.1308/003588406X98540>. These abstracts are of an equally high standard to those published in the January issue but, due to limitations of funding, the College is only able to give grants to 20% of applicants.

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