The Fifth National Audit Project: implications for hospital doctors

The 5th National Audit Project (NAP5) is a partnership between the Association of Anaesthetists of Great Britain and Ireland and the Royal College of Anaesthetists. Accidental awareness is of great importance to patients and anaesthetists: it appears to be one of the commonest adverse outcome for patients to discuss before surgery (along with postoperative nausea and vomiting). In one study, 'awareness with pain' was the outcome (other than death) anaesthetists most wished to avoid for their patients (Macario et al, 1999).

Nonetheless, the incidence of accidental awareness during general anaesthesia remains controversial. Numerous studies where patients are questioned after surgery (using the Brice protocol) to identify accidental awareness during general anaesthesia consistently report an incidence of ~1 in 600 (an average of one case per consultant every 2 years) and that up to 50% of these patients develop significant psychological sequelae or post-traumatic distress disorder (Sandin et al, 2000). Yet very few anaesthetists or departments recognize this extraordinarily high incidence in their routine work.

Only one modern-day study has reported a much lower rate of accidental awareness during general anaesthesia than ~1:600 (Pollard et al, 2007), who reported an incidence of ~1:14 000. One possible explanation of this paradox is that many of the studies predate significant changes in anaesthetic practice such as total intravenous anaesthesia, the availability of depth of anaesthesia monitors and changes in the use of neuromuscular-blocking drugs.

The National Audit Project

The NAP5 structure consists of local coordinators in each trust who upload anonymised information about the patient's general anaesthetic obtained from the chart onto a secure, dedicated website from which these data are analysed. NAP5 received notification of all patient reports of accidental awareness during general anaesthesia between 1 June 2012 and 31 May 2013. It will report in full in early 2014. NAP5 examines only explicit reports of accidental awareness during general anaesthesia and is not designed to captured those who recall awareness but do not report it to their carers, or those who experience wakefulness during anaesthesia or surgery and do not recall it (implicit awareness) (Cook and Pandit, 2012).

NAP5 seeks to answer the following questions:

1. How many patients in a defined population spontaneously report accidental awareness during general anaesthesia?
2. How do these patients present: when, to whom and how?
3. To what extent do recognized risk factors, e.g. obstetrics, trauma, cardiac, paediatrics, total intravenous anaesthesia, depth of anaesthesia monitors, feature in the reported cases?

The project will also aim to extract these and other themes from the cohort by qualitative analysis of reported cases and explore what patient stories tell us about patients' desires and expectations soon after an episode of accidental awareness during general anaesthesia (and, perhaps, how these change with time).

NAP5 will help us to further refine strategies to prevent accidental awareness during general anaesthesia and perhaps identify the optimal process for managing cases of explicit awareness and inform a national strategy. NAP5 will not address questions such as how many cases of awareness can be identified using a Brice protocol or how many cases of implicit awareness are there? Also, NAP5 is not an interventional trial, so there are no questions about whether any particular therapy or monitoring is beneficial. An identical survey in the Republic of Ireland, part of the Irish limb of NAP5, will provide comparative international data for the first time.

Baseline survey

The NAP5 Baseline Survey was the first phase of this project, and consisted of questionnaires sent to each of 8672 senior anaesthetists (consultants and career grades) in the UK NHS (Pandit et al, 2013a,b). There was a huge response rate of 100% of UK NHS trusts, and 82% of senior anaesthetists.

The salient finding was that, for the year 2011, there were 153 new cases of accidental awareness during general anaesthesia made known to trusts. Using known denominator data for the number of general anaesthetics administered in the UK (Woodall and Cook, 2011), this yields an incidence of ~1:15 000, which is perhaps reassuringly low. The career incidence of accidental awareness during general anaesthesia was one case for every ~36 years of practice as a senior.

Most trusts did not know of any reports in 2011, but a handful knew of up to four cases. Two-thirds of cases arose in the 'dynamic', short-lived phases of anaesthesia, i.e. during induction and emergence. Only a third were associated with pain or distress but where this was experienced, it was commoner with awareness during surgery itself. Just 35 patients (23% of the total experiencing awareness) submitted a complaint or a claim for legal redress.

Use of monitoring

There are available several monitors of brain function, designed to attempt to detect awareness during anaesthesia ('depth of awareness' monitors). They generally work by detecting the electroencephalogram and analysing its pattern to distinguish between being awake *vs* being anaesthetized. Strikingly, the baseline survey discovered that only two-thirds of UK hospitals possess any type of depth of awareness monitor. Further, only a quarter of UK anaesthetists use a depth of awareness monitor, even for selected cases (only ~2% use it routinely).

This rejection of depth of awareness monitoring warrants explanation, espe-

cially since the National Institute for Health and Clinical Excellence has recommended increased use of such monitoring (Pandit and Cook, 2013). One possibility is that anaesthetists know that the monitors cannot reliably tell when a patient is anaesthetized, and there is uncertainty as to whether the use of such monitors reduces the incidence of awareness (Pandit and Cook, 2013).

Prospective data

The prospective phase of NAP5, analysing the data from the local coordinators, will provide shaper data about several issues described above. It will provide an additional estimate of incidence, this being based on regular, active searching for cases that are reported across the hospital specialties (and perhaps missed by the anaesthetic department). Indeed, GPs have been alerted to NAP5's activity, via collaboration with the Royal College of General Practitioners.

Outcomes

NAP5 will also provide clearer accounts of patient experiences and an in-depth exploration of causal factors in the episode. Some cases are expected to arise as a result of some interruption in delivery of adequate anaesthetic agent to the patient, whether this was by putative human factors or machine or equipment failure. However, in some cases there may have been irreproachable conduct and delivery of agent, yet the patient may have nonetheless been aware. It is also hoped that the data will provide an estimate of the use of depth of awareness monitors and whether any accidental awareness during general anaesthesia events occurred despite the use of these monitors.

The NAP5 project is the largest ever study of the topic of accidental awareness during general anaesthesia and the final project report should provide new data and insights of value for patients, their anaesthetists and those commissioning their services. BJHM

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Cook TM, Pandit JJ (2012) NAP5: accidental awareness during general anaesthesia. *Bulletin of the Royal College of Anaesthetists* **72**: 29–31
Macario A, Weinger M, Truong P, Lee M (1999) Which clinical anesthesia outcomes are both common and important to avoid? The perspective of a panel of expert anesthesiologists. *Anesth Analg* **88**: 1085–91
Pandit JJ, Cook TM (2013) National Institute for Clinical Excellence guidance on measuring depth of anaesthesia: limitations of EEG-based technology. *Br J Anaesth* **110**: 325–8
Pandit JJ, Cook TM, Jonker WR, O'Sullivan E (2013a) A national survey of anaesthetists (NAP5 Baseline) to estimate an annual incidence of accidental awareness during general anaesthesia in the UK. *Anaesthesia* **68**: 343–53
Pandit JJ, Cook TM, Jonker WR, O'Sullivan E (2013b) A national survey of anaesthetists (NAP5 Baseline) to estimate an annual incidence of accidental awareness during general anaesthesia in the UK. *Br J Anaesth* **110**: 501–9
Pollard RJ, Coyle JP, Gilbert RL, Beck JE (2007) Intraoperative awareness in a regional medical system: a review of 3 years' data. *Anesthesiology* **106**: 269–74
Sandin RH, Enlund G, Samuelsson P, Lennmarken C (2000) Awareness during anaesthesia: a prospective case study. *Lancet* **355**: 707–11
Woodall N, Cook TM (2011) A national census of airway management techniques employed during anaesthesia in the UK: results of the first phase of the 4th National Audit Project at the Royal College of Anaesthetists. *Br J Anaesth* **106**: 266–71

KEY POINTS

- The incidence of accidental awareness during anaesthesia, known to anaesthetists, is rare at ~1:15 000 general anaesthetics.
- Most experiences are brief, occurring at anaesthetic induction or emergence.
- Only a third of the experiences are associated with pain or distress.
- Only a quarter of anaesthetists ever use brain monitoring for depth of anaesthesia.
- However, the incidence of awareness reported in other prospective trials where patients are directly questioned post operatively is higher, at 1–2:1000, and this needs further examination.