CRITICAL INCIDENTS – AWARENESS UNDER ANAESTHESIA

FINAL FRCA COURSE

DR M BISHOP

8/9/21

INTRODUCTION

- Resources
- Definitions
- Incidence
- Risk factors
- Consequences
- Prevention
- Management

RESOURCES

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PDF [600 KB] Figures

Accidental awareness under general anaesthesia: Incidence, risk factors, and psychological management

M.C. Kim • G.L. Fricchione • O. Akeju

Published: January 20, 2021 • DOI: https://doi.org/10.1016/j.bjae.2020.12.001

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PDF [67 KB] Figures

Awareness during anaesthesia

Jonathan G Hardman, BMedSci BM BS DM FANZCA FRCA • Alan R Aitkenhead, BSc BM BS MD FRCA

Open Archive • DOI: https://doi.org/10.1093/bjaceaccp/mki049

NAP5

5th National Audit Project of
The Royal College of Anaesthetists and the
Association of Anaesthetists of Great Britain and Ireland

Accidental Awareness during General Anaesthesia in the United Kingdom and Ireland

Report and findings

September 2014

Editors
Professor Jaideep J Pandit
Professor Tim M Cook

The Royal College of Anaesthetists

Association of Anaesthetists of Great Britain and Ireland

NAP National Audit Project

DEFINITIONS

- Awareness is the ability to **perceive sensory information** of the surroundings while under general anaesthesia, which may include sensation of pain
- **Explicit awareness** = Ability to consciously recall events that occurred during GA
  - May be associated with/without pain
  - Spontaneous recall/upon questioning
- **Implicit awareness** = Ability to subconsciously recall events that occurred during GA
  - May affect behaviour/performance

INCIDENCE

NAP 5

- Approx. ***1 in 19,600***
- Very variable depending on type of surgery, type of patient group looked at.
  - If no NMB used: 1 in 136,000
  - If NMB used: 1 in 8,600
  - Obstetrics: 1 in 670
  - Cardiothoracics: 1 in 8,600
- **73%** of certain/probable reports of AAGA were preventable

Incidence reported by patients:

- 1-2 in 1000

RISK FACTORS

- ***Anaesthetic factors***
  - Induction and emergence phases
  - Transition from anaesthetic room to theatre (“Mind the Gap”
  - TIVA (lack of monitoring of depth/inadequate dose)
  - RSI
  - Thiopentone
  - Use of muscle relaxants
  - Drug error – wrong drug, inadequate dosing etc.
  - Transition from volatile to TIVA (or back)
  - Junior anaesthetist

RISK FACTORS

- ***Patient factors***
  - Young adult
  - Obese
  - Female
  - Previous history of awareness
  - Resistance to anaesthetic (alcoholic, pyrexic, hyperthyroid)
  - Unstable/moribund
  - Use of recreational drugs (opioids, amphetamines, cocaine)
  - Difficult airway

RISK FACTORS

- ***Surgical factors***
  - Cardiothoracic + bypass
  - Obstetric
  - Emergency surgery
  - Neurosurgery
  - High volume blood loss

RISK FACTORS

- ***Equipment factors***
  - Lack/failure of monitoring of depth (BIS, entropy)
  - Lack/failure of gas analysis
  - Failure to monitor IV cannula (TIVA)
  - Failure to use nerve stimulator
  - Failure to monitor patient condition during procedure (ie. signs of awareness)
  - Breathing system malfunction/disconnection
  - Vaporizer error – empty, contaminated, mis-calibrated

→ ***Not*** risk factors: ↑ASA grade, physical status, ethnicity, nitrous oxide use

CONSEQUENCES

- Many patients first reported AAGA during preparations for subsequent procedure
- 47% of cases described AAGA in a neutral way
- 53% of cases described AAGA as distressing
  - Pain
  - Paralysis

CONSEQUENCES

- **Patient -** Mostly Psychological
  - Insomnia (including nightmares)
  - Depression/anxiety
  - PTSD / Flashbacks (43%)
  - Avoidance of future medical intervention
  - ASD (Acute Stress Disorder)
- **Medical**
  - Medicolegal
  - Professional

CONSEQUENCES

- **Risk factors for developing PTSD:**
  - Poor social support
  - History of PTSD
  - Prior mental health treatment
  - Dissociation related to surgery
  - Perception that patient’s life was in danger during surgery
  - Intraoperative awareness

SIGNS OF AWARENESS + POSSIBLE CONFOUNDING FACTORS

Sign of Awareness	Factors Masking Sign
Tachycardia	Heart block, β blocker, hypothyroidism, autonomic neuropathy
Hypertension	Heart block, β blocker, hypothyroidism, vasodilators, epidural analgesia, blood loss, autonomic neuropathy
Sweating	Anti-muscarinics (atropine/glycopyrrolate)
Tear Production	Anti-muscarinics, eye tape/ointment
Movement/Grimacing	Neuromuscular blocker, sheets covering
Tachypnoea	Neuromuscular blocker
Pupillary dilatation/reactivity	Anti-muscarinics, opioids, ocular pathology, eye tape/ointment

PREVENTION

- ***ENSURE ADEQUATE DOSE OF ANAESTHETIC***
  - Consider benzodiazepine
  - Minimise use of NMBs

- ***CLINICAL MONITORING***
  - Anaesthetist presence
  - Eye position
  - Pupil dilatation / reactivity
  - Sweating
  - Lacrimation
  - Tachypnoea
  - Movement
  - Reaction to airway manipulation

- ***GENERAL MONITORING***
  - RR, HR, BP, TV/MV
  - End-tidal volatile concentration
  - TIVA effector-site / plasma-site concentration
  - TOF
- ***DEPTH OF ANAESTHESIA MONITORING***
  - Processed EEG monitors – Entropy, BIS
  - Auditory evoked potentials

ANAESTHETIC MANAGEMENT

- Speak to Consultant
- Speak to patient with witness (Cons) present – history of events + experiences esp. pain
- Review notes + identify possible cause
- Apologise to patient + explain what happened
- Reassure as able
- Contact GP + surgeon
- Incident form
- Contact medical defence advisor
- Debrief with senior regarding areas to improve
- Consider referral for ***psychological/psychiatric support***

MODIFIED BRICE QUESTIONNAIRE

- What is the last thing you remember before your surgery?
- What is the first thing you remember after waking up?
- Can you recall anything between going under anaesthesia and waking up?
- Did you dream anything during surgery? If so, was it disturbing?
- What did you find most unpleasant about the surgery?
- Did you have problems going to sleep or waking up?

LONG-TERM MANAGEMENT

- Psychotherapeutic (1st line)
  - CBT
  - Eye movement desensitisation and reprocessing
  - Group therapy
- Pharmacological (2nd line)
  - SSRIs – for ASD/PTSD
  - Consider anticonvulsants (carbamazepine, topiramate) or atypical antipsychotics (olanzapine, quetiapine)
    - Limited evidence

OLDER METHODS OF DEPTH OF ANAESTHESIA MONITORING

- Isolated forearm technique
- Forehead galvanometry
- Oesophageal motility
- EEG
- Auditory evoked potentials

?

SUMMARY

- Awareness of risk factors + methods of prevention
- Careful clinical monitoring + maintenance
- Take all claims of AAGA seriously and seek further information
- Referral for psychological support is vital

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CRQ

a) What is the estimated incidence of accidental awareness under general anaesthesia (AAGA)? (1 mark)

_____

You are informed by a midwife that a patient whom you recently anaesthetised for a lower segment caesarean section under general anaesthesia may have suffered AAGA. You visit her on the surgical ward the following day.

b) A questionnaire has been devised to help reliably detect AAGA. What is the name of this questionnaire? (1 mark)

_____

c) List four of the questions from this questionnaire that you would ask this patient to reliably detect AAGA (4 marks)

1. _____

2. _____

3. _____

4. _____

CRQ

d) Complete the following table listing some risk factors that predispose a patient to AAGA (4 marks)

Type of Risk Factors	**Example**
Drug-related risk factors	1. _____ 2. _____
Patient-related risk factors	1. _____ 2. _____
Surgical subspecialties at risk other than obstetric patients	1. _____ 2. _____
Organisational risk factors	1. _____ 2. _____

CRQ

e) List four specific strategies, recommended in the NAP5 handbook from the Association of Anaesthetists, that should reduce the risk of AAGA during induction (and maintenance) of anaesthesia in healthy parturients (4 marks)

1. _____

2. _____

3. _____

4. _____

f) In the context of AAGA, what is meant by the term “mind the gap”? (1 mark)

_____

CRQ

CHAPTER 4 | **NAP5 Executive Summary**

Recommendation 47

Consideration should be given to reducing the risk of AAGA in healthy parturients by:

(a) The use of increased doses of induction agents.

(b) Rapidly attaining adequate end-tidal volatile levels after induction without delay.

(c) Use of nitrous oxide in adequate concentrations.

(d) Appropriate use of opiates.

(e) Maintaining uterine tone with uterotonic agents to allow adequate concentrations of volatile agents to be used.

CRQ

After meeting with the patient, you believe she has experienced AAGA.

g) List the four cardinal signs that should be looked for within the first 24 hours to help determine the impact of this experience (4 marks)

1. _____

2. _____

3. _____

4. _____

h) If these cardinal signs of impact are detected, what should be the next most appropriate course of action? (1 mark)

_____