RUH

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Media Release

Obese patients have double the risk of airway problems during an anaesthetic. Study also shows routine monitoring of breathing could reduce deaths in intensive care

A national study by a consultant anaesthetist at the Royal United Hospital Bath NHS Trust has shown that overweight or obese patients are twice as likely to develop serious airway problems during a general anaesthetic as non-obese patients. 'The airway' means the air passages from the outside world to the lungs, which must be kept open to keep the patient alive. The study also shows that the use of a simple breathing monitor, called a capnograph, could significantly reduce deaths and brain damage from such problems in intensive care units (ICUs); it found that absence of a capnograph contributed to 74% of deaths from these events in ICUs during the study.

The report, which is published in two parts online today, Wednesday 30th March 2011, in the British Journal of Anaesthesia [1], is the result of a year long collaboration between the Royal College of Anaesthetists (RCoA) and the Difficult Airway Society

The project, which identified that 2.9 million general anaesthetics are given in the UK each year, monitored all major complications of airway management that occurred in these patients and in ICUs and in emergency departments throughout the UK in 2008-2009. It studied only events serious enough to lead to death, brain damage, ICU admission or urgent insertion of a breathing tube in the front of the neck.

The report has several findings and recommendations; but those on obesity and the monitoring of breathing are among the most striking. In addition to the two-fold increased risk of obese patients developing serious airway problems during an anaesthetic, the study also found that patients with severe obesity [2] were four times more likely to develop such problems. In addition, obese patients were more likely to die if they sustained airway complications in ICU. Some obese patients died from complications of general anaesthesia whilst undergoing procedures that could have been performed under local or regional anaesthesia (where only part of the patient's body is anaesthetised). In some cases this alternative appeared not to be considered.

Dr Tim Cook, a Consultant in Anaesthesia and Intensive Care at the RUH says: "The findings of this report indicate that when airway problems arise in this group of sick patients the consequences are often very severe. The report makes several recommendations to improve the safety of airway management in the ICU. The single most important change that would save lives is the use of a simple

breathing monitor, which would have identified or prevented most of the events that were reported. We recommend that a capnograph is used for all patients receiving help with breathing on ICU; current evidence suggests it is used for only a quarter of such patients. Greater use of this device will save lives."

Dr Nick Woodall, Consultant Anaesthetist at the Norfolk and Norwich Hospital and an author of the report says: "Our findings show that patients who are obese have twice the risk of major airway problems during anaesthesia, compared to non-obese patients. In the very obese this risk is even higher. The report is important for patients and anaesthetists alike. The information will enable obese patients to be better informed about the risks of anaesthesia and to give informed consent. We hope our findings will encourage anaesthetists to recognise these risks and choose anaesthetic techniques with a lower risk, such as a regional anaesthesia, where possible, and also prepare for airway difficulties when anaesthetising obese patients."

The study also looked at how a patient's breathing was monitored whilst they were in intensive care units (ICU). It found that airway problems were more likely to result in death in patients sedated on ICUs than if they occurred during anaesthesia for surgery. Half of the reports of events on ICUs described a patient death from the complication, whereas 12% died when the complication occurred during anaesthesia. Of the events reported from ICU 61% led to death or brain damage, compared to 14% of events during anaesthesia. The most important finding was that the absence of a breathing monitor (capnograph) contributed to 74% of airway related deaths reported from ICUs. The authors say that if the monitor had been used it would have identified problems at an earlier stage and so could have prevented some of the deaths altogether. The capnograph, which detects exhaled carbon dioxide, is used almost universally in anaesthesia but only sporadically in ICUs. Several authors and organisations have recommended that it should be used routinely in ICUs but, at present, this does not appear to be happening.

Dr Cook says: "Despite the finding of this project, it is clear that anaesthesia remains extremely safe. The report estimates that a life-threatening airway complication occurs in less than one in 20,000 general anaesthetics (0.005%) and death in approximately one in 180,000 anaesthetics. Most patients who had complications that were reported to this project had identifiable risk factors such as obesity or head and neck cancer; these patients are at a much higher risk of airway complications than healthy patients undergoing anaesthesia and surgery."

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[1] "Major complications of airway management in the UK: results of the 4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1 Anaesthesia." British Journal of Anaesthesia. doi:10.1093/bja/aer058 and Major complications of airway management in the UK: results of the 4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 2 Intensive Care and Emergency Departments.

British Journal of Anaesthesia. doi:10.1093/bja/aer059

[2] Obesity is defined as a body mass index of >30 and severe (morbid) obesity as >40. Body mass index is calculated as weight in kilogram / (height in metres squared): and expressed in the units kg/m2

Notes for editors

Please acknowledge the journal as a source in any articles.

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The full report is called: “4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society: Major complications of Airway Management in the UK.”

It will be published by the Royal College of Anaesthetists on 29 March 2011 at 23.30 hrs (BST) and will be available on the website at http://www.rcoa.ac.uk/nap4. This project was widely supported by a large number of medical organisations, medical indemnity organisations and by the Chief Medical Officers of all four countries in the UK.

The website of the lead organisations are Royal College of Anaesthetists http://www.rcoa.ac.uk and http://www.rcoa.ac.uk/nap4. Difficult Airway Society http://www.das.uk.com/ and http://www.das.uk.com/natauditproject

Other partners include

National Patient Safety Agency http://www.npsa.nhs.uk/

Intensive Care Society http://www.ics.ac.uk/

College of Emergency Physicians http://www.collemergencymed.ac.uk/

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Technical details

The airway and airway management When doctors talk about the airway they mean the breathing passages from the outside world to the lungs. These are the nose and mouth, the pharynx (throat), the larynx (voicebox), the trachea (windpipe) and bronchi (lung passages). These passages enable oxygen in air to enter the lungs and carbon dioxide to leave the body. The airway must remain open at all times or the patient will suffocate in a few minutes. When a patient is unconscious there is a tendency for the airway to collapse (obstruct) as the muscles keeling the airway open stop working. When a patient is anaesthetised, the anaesthetist (a specialised doctor) keeps the airway passages open by inserting a tube (there are various sorts) into the airway. One of the important roles an anaesthetist has during anaesthesia and surgery is to monitor that the airway is clear and that oxygen levels are normal: monitors assist the anaesthetist and use of a capnograph is routine. In ICU many patients need help with their breathing (ventilation). The patient is usually sedated rather than anaesthetised and a tube is inserted into the trachea via the mouth and larynx (a tracheal tube). Some patients have a hole made in the front of their neck (tracheostomy) and a tube placed directly into the trachea (tracheostomy tube). The tube (artificial airway) stays in place until the patient has recovered enough for it to be removed.