The end of the rapid sequence induction?

The rapid sequence induction has been a cornerstone of anaesthetic teaching since it was first described in 1970. Although the technique is taught as a standard protocol there is considerable variation in its practice. So, can we reach consensus over what to include in 'the safe, textbook version' of a rapid sequence induction in modern anaesthesia?

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Introduction

The rapid sequence induction has been a cornerstone of anaesthetic teaching since it was described by Stept and Safar in 1970. Many anaesthetists still teach the original 'textbook rapid sequence induction protocol' which includes:

- Maximal preoxygenation
- Predetermined doses of thiopentone and suxamethonium
- Cricoid pressure
- Avoidance of apnoeic ventilation
- Tracheal intubation.

Although the technique is taught as a standard protocol there is considerable variation in its practice.

The case against rapid sequence induction

Of the elements above, the following are specifically described for rapid sequence inductions in the Royal College of Anaesthetists' guide for novice anaesthetists (Hammond and Davies, 2019): choice and dosing of drugs during induction, use of cricoid pressure, and avoidance of ventilation.

The drugs used for rapid sequence induction vary across settings. In obstetric anaesthesia the National Audit Project 6 (NAP) notes that while thiopentone is most common, its use is declining in favour of propofol (likely because of the awareness risk). In the prehospital setting ketamine is almost exclusively used. The use of predetermined doses in rapid sequence inductions is also contentious, reflecting the risks of both under-dosing (awareness and suboptimal airway control) and over-dosing (cardiovascular instability) (Wicker et al, 2014).

Suxamethonium is described as the standard neuromuscular-blocking agent for rapid sequence induction. It was thought by Stept and Safar that the effect of suxamethonium on intragastric pressures during its depolarising phase increased the risk of sudden regurgitation, and this appears to have originally influenced the design of the protocol. Rocuronium (a non-depolarising neuromuscular blocker) has a lower risk of many of the side effects that suxamethonium can induce (including malignant hyperthermia, hyperkalaemia, suxamethonium apnoea and anaphylaxis). In addition, unlike suxamethonium, rocuronium ensures complete sustained paralysis (Yentis et al, 2018), which is a first-line intervention for unanticipated difficult airways.

The debate on the use of cricoid pressure is well established in anaesthesia. At best, the justification for its use is equivocal. The Difficult Airway Society recognises this by recommending early release of cricoid pressure in the difficult airway algorithm. The Difficult Airway Society guidelines also now recommend gentle apnoeic ventilation during rapid sequence induction for patients at risk of desaturation (Frerk et al, 2015).

The widespread use of various modified rapid sequence induction techniques highlights the limitations of the current protocol. With the wide range of individual practices now falling under the umbrella of rapid sequence induction, it is increasingly difficult to identify a single, evidence-based protocol to teach anaesthesia novices. Does this indicate that the time has come to replace it?

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The case for rapid sequence induction

Both NAP 4 and 5 acknowledge the importance of human factors in reported incidents: distractions, lack of clarity over lines of responsibility, errors of training, and education all contribute (Cook et al, 2011). For all its individual controversies, the term 'rapid sequence induction' represents an opportunity for a shared mental model for induction of anaesthesia. This is particularly useful in emergency situations.

The rapid sequence induction aims to produce anaesthesia and airway protection safely in the shortest time interval. Recognising how (and when) to achieve this will always remain an important paradigm in anaesthetic training. For novices, it provides an opportunity to learn about aspiration risk reduction as a care bundle, considering the multitude of measures we can take. It also functions as a decision point to communicate their level of concern about any given patient.

Conclusions

The rapid sequence induction has been used in anaesthesia for nearly 50 years and its many varied faces demonstrate that one single procedure is not what is currently practised in the UK or worldwide. However, there will always be an argument for seeking a single, safe procedure or care bundle to teach for emergency anaesthesia. Perhaps an updated version of the rapid sequence induction can take up the mantle to guide the anaesthetists of the future.

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