Trends in Anaesthesia and Critical Care xxx (2015) 1–4

Contents lists available at ScienceDirect

Trends in Anaesthesia and Critical Care

journal homepage: www.elsevier.com/locate/tacc

COMMENTARY

Cricoid pressure: The case in favour

Vassilis Athanassoglou [a], Jaideep J. Pandit [a, b, *]

[a] Nuffield Department of Anaesthetics, Oxford University Hospitals NHS Trust, Oxford, UK
[b] St John's College, Oxford, UK

Keywords:
Anaesthesia
Intubation
Rapid sequence induction
Regurgitation
Aspiration

SUMMARY

Cricoid pressure (CP) was introduced into anaesthetic practice in the 1960s and has become the standard of care for patients at risk of aspiration during induction. However, the evidence supporting the widespread use of CP to prevent aspiration remains unconvincing. Equally, there is no robust evidence to suggest that CP causes harm, and as such, CP has become an established technique because of a mixture of anecdotal evidence and expert opinion. The future of CP lies in the answer to the question as to whether it is actually effective in preventing regurgitation or whether it is an unnecessary hazard.

1. Introduction

Cricoid pressure (CP), as a means of preventing gastric distension, was first reported by Monro in 1774 during inflation with bellows of the lungs of persons "drowned and seemingly dead" and it was recognised that during resuscitation of near-drowning victims pressure should be applied on the cricoid ring to prevent air from entering the stomach.[1]

There was no further mention of CP until Sellick, in 1961, reported using "occlusion of the upper oesophagus by backwards pressure on the cricoid ring against the bodies of the cervical vertebrae to prevent gastric contents from reaching the pharynx" and thus subsequent aspiration into the lungs during induction of anaesthesia in patients at high risk of aspiration.[2] This came fifteen years after Mendelson, who in 1946, reported the risk of pulmonary aspiration of gastric contents during mask anaesthesia.[3]

Cricoid pressure, or Sellick's manoeuvre, is the application of sustained digital pressure to the cricoid cartilage pushing it backwards and thus compressing the oesophagus between the posterior aspect of the cricoid and the body of C5–6. Sellick's conclusion was based on evidence from lateral neck X-rays. The cricoid cartilage is used because it forms the only complete ring of the larynx and trachea. It has traditionally been considered an integral part of patient safety in rapid sequence tracheal intubation and emergency airway management due to it being intuitively helpful in preventing regurgitation of gastric contents.[4]

Before the routine use of CP, maternal death from inhalation of stomach contents was a leading cause of death from anaesthesia in England and Wales. Although CP was first described in 1961, it was not in widespread use until about 1970. In the Confidential Enquiries into Maternal Death in England and Wales from 1964 to 1969 there were 52 deaths from aspiration.[5] In the last five triennial reports of the Confidential Enquiries into Maternal Death in the UK from 1994 to 2005 there have been only three deaths from aspiration pneumonitis.[5–8] One patient did not have CP applied,[7] and the other aspirated after failed intubation and may have had CP released at that time.[7] There was one death in the Centre for Maternal and Children Enquiries (CMACE) 2011 report, attributed to aspiration of gastric contents.[9] However, in that case aspiration occurred at extubation post caesarean section.[9]

2. The current practice

The goal of CP is prevention of regurgitation of gastric contents, with subsequent aspiration into the lungs. Some authors have described CP as the "lynchpin of physical prevention of aspiration" and a minimum standard of care, implying any clinical trials to 'prove' its worth could be unethical.[10] Its continued use during rapid sequence induction (RSI) is based on anecdotal evidence and expert opinion.[11] It has become the standard of care and it is unlikely that a large randomised controlled trial (RCT) will be done to assess its role in high-risk patients as it would be unethical for half of the subjects at risk to be denied a technique that is regarded as a standard of care. Equally, there is no robust evidence to suggest that CP causes harm, and perhaps this aspect has made it an established technique.[11,12,13]

* Corresponding author. Nuffield Department of Anaesthetics, Oxford University Hospitals, Oxford OX3 9DU, UK. Tel.: +44 1865 221590; fax: +44 1865 220027.
E-mail address: jaideep.pandit@dpag.ox.ac.uk (J.J. Pandit).

http://dx.doi.org/10.1016/j.tacc.2015.02.001
2210-8440/

However, in recent years it has come under considerable scrutiny and some criticism, with some authors even arguing for its abandonment.[14] There have been two systemic reviews in the past that concluded that there was no evidence for or against the application of CP.[15] Three reviews on rapid sequence induction and CP have all pointed out that there are no published randomized controlled trials comparing the incidence of regurgitation on induction, with and without CP in patients at high risk of regurgitation.[14,16,17] Cook et al. found that 11% of anaesthetic assistants surveyed had experienced regurgitation in their patients despite application of CP.[18] Fenton and Reynolds (2009) in their study of the application of CP and maternal outcome in patients undergoing caesarean sections in Malawi argue that its efficacy in saving lives is difficult to establish. They concluded that there was no evidence that CP prevented regurgitation and saved lives.[19] However, Vanner, in an editorial, gave a more balanced view. He argued that CP has led to the reduction of deaths from regurgitation and aspiration in the UK.[20] There are often anecdotal arguments that French anaesthetists do not apply CP; however, a survey of French anaesthetists in 1998 showed that the overwhelming majority do routinely apply CP.[21] Moreover, a French RCT comparing the effectiveness of CP in the incidence of regurgitation in high-risk patients showed no regurgitation in the CP group compared with three patients in the non CP group.[22]

Advocates of CP contend that its incorrect application is the main reason for the reported problems rather than any fundamental deficiency of the method.[1,15] Incorrect timing, the use of excessive force, and compressing the thyroid cartilage instead of the cricoid cartilage are examples of misuse of CP. Advocates also stress the added benefit of the ability of CP to prevent gastric insufflation when mask ventilation is needed before tracheal intubation.[23] Vanner and Asai noted that especially the force used in CP was a relevant factor in its success in preventing regurgitation of gastric contents.[24]

3. How big is the problem of aspiration?

Since the initial comprehensive review of the incidence of pulmonary aspiration, in obstetric patients, by Mendelson in 1946,[25] several large retrospective observational studies have been published.[25–29] Most of these reports concentrated on either the paediatric population[25,26] or mixed populations[28,29] and only one study focused on the adult surgical/obstetric population.[27]

The incidence of aspiration in the general surgical population has been reported in three large studies. Olsson et al. found an aspiration incidence of 1:2131 during anaesthesia in 185,385 patients, with a mortality rate of 1:45,454. Forty-seven per cent of the patients who aspirated developed pneumonitis and 17% required lung ventilation.[28] In a study of 85,594 adult surgical patients by Mellin-Olsen et al. calculated the incidence of pulmonary aspiration being 2.9:10,000, all in patients undergoing general anaesthesia. The incidence was four times greater in emergency cases.[29] A retrospective review of >200,000 patients in the Mayo Clinic revealed an aspiration rate of 1:3,216, with a mortality rate of 1:71,829.[27]

In children, the risk of regurgitation and pulmonary aspiration may be greater but it is rarely associated with pneumonitis.[30,31] With regards to obstetric anaesthesia, patients undergoing Caesarean section under general anaesthesia have at least twice the risk of pulmonary aspiration when compared with the general population. An Italian study quoted an incidence of aspiration between 1:1431 and 1:1,547, whereas a more recent study reported aspiration in 1:900 patients undergoing Caesarean section.[32,33]

4. The key questions

To decide whether or not the practice of CP should be continued or not we need to be able to answer two questions: 1) Does CP prevent stomach inflation during manual lung ventilation? and 2) Does CP prevent regurgitation and aspiration?

4.1. The evidence for CP preventing stomach inflation

The initial supporting evidence for CP came from relatively small cadaveric studies. Yet, the difference between a cadaveric response to regurgitation and the response of an anaesthetised human is poorly defined.[34] The interplay between the upper oesophageal sphincter, lower oesophageal sphincter, and intragastric pressure is a complicated dynamic process that cannot be replicated in non-responsive tissue. The tone of the sphincters and the degree of intragastric pressure varies significantly between cadavers, patients in cardiac arrest, obtunded emergency patients and elective patients.[35–38]

The application and success of CP involves many variables, including the operator and patient. The effectiveness of CP in preventing regurgitation is likely to vary on the method of application, as well as the ventilation technique and other patient-specific variables. Imaging studies suggest that the differing results of CP may be due to variability in the anatomic relationships between the cricoid ring, the oesophagus, and the vertebral body. On CT and MRI imaging the application of CP increased the lateral displacement of the oesophagus.[39,40] Considering the mobility of the larynx relative to the oesophagus, coupled with operator variability, CP is unlikely to provide uniformly effective oesophageal compression. There is solid evidence that cricoid pressure is applied inconsistently.[41,42] In other words, the argument as to whether CP is effective or not should revolve around whether it is employed correctly or not (i.e, without excessive force, at the correct location, at the appropriate time). CP should be highly patient-dependent and the focus should be taken away from the prescriptive application of force on the cricoid ring.

There are at least two aspects to ‘success’ of CP. First, is the extent to which a certain applied force demonstrably occludes the oesophagus without causing other forms of anatomical disruption to neighbouring tissues. Second is whether this anatomically optimal result yields a beneficial functional result in preventing gastric distension or regurgitation.

Sellick, in his original description, suggested that correct application of CP would prevent gastric insufflation during bag-valve-mask ventilation. He found that gastric inflation was unlikely to occur if inflation pressure did not exceed 15–20 cm H_2O.[2]

There is a relationship between the pressure required to ventilate the lungs and that forcing air in the stomach. Airway pressures below 16 cm H_2O, even without CP, rarely lead to insufflation of air in the stomach.[43,44] Application of CP increases the applied airway pressure that is needed before air enters the stomach.

Studies have shown that CP prevented gastric insufflation in adults and children being ventilated with high tidal volumes and inspiratory pressures.[43–45] Provided peak inspiratory pressure does not exceed 35 cmH_2O, ventilation with bag-valve-mask should not lead to gastric insufflation. CP applied during facemask ventilation prior to laparoscopic cholecystectomy was shown to prevent gastric insufflation.

4.2. The evidence for CP preventing regurgitation and aspiration

Cadaveric studies showed that CP consistently prevented saline or water leakage into the pharynx from the oesophagus at oesophageal pressures from 50 cm H_2O of up to 100 cm H_2O.[35,36]

Please cite this article in press as: Athanassoglou V, Pandit JJ, Cricoid pressure: The case in favour, Trends in Anaesthesia and Critical Care (2015), http://dx.doi.org/10.1016/j.tacc.2015.02.001

Sellick in 1962 conducted another observational study where a patient undergoing oesophagectomy under general anaesthesia, had his oesophagus distended with saline up to pressure of 100 cm H_2O.[46] CP was being applied and no regurgitation was observed.[46] Neelakanta documented in an elective patient that on release of CP gastric fluid appeared in the patient's mouth.[38]

There have not been any clinical trials looking into whether CP protects against aspiration. However, there are case reports and surveys that indicate that aspiration occurred despite CP being applied.[44–48] However, it is impossible to determine whether aspiration occurred due to the technique itself or the incorrect application of the technique as there are numerous anatomic studies showing how the oesophagus is displaced when CP is applied and thus is incompletely occluded.[39,40] The potential for lateral positioning and displacement of the oesophagus relative to the cricoid cartilage possibly explains a number of case reports, where despite seemingly appropriate application of CP during RSI, regurgitation and aspiration, occurred nevertheless.

In the UK all maternity units surveyed in 1994 routinely applied CP during induction of general anaesthesia in the last trimester of pregnancy.[49,50] The anaesthetic Activity Survey of the 5th National Audit Project (NAP5) estimated 8-9000 caesarean sections under general anaesthesia in England.[51] If one assumes approximately the same denominator each year, then according to the results from the CMACE reports failure of CP has not resulted in a maternal death in many tens or hundreds of thousands of caesarean sections under general anaesthesia.[20]

5. Lessons from NAP4

In NAP4, aspiration was shown to be the single commonest cause of death in anaesthesia events.[52] NAP4 identified a total of 42 aspiration events (out of 114,904 general anaesthetics). Of these 34 occurred during anaesthesia, six on the intensive care unit and two in the emergency department. There were 11 adverse events in total, of which there were 9 deaths and two cases of brain damage all in anaesthesia cases. The majority of cases occurred during maintenance of anaesthesia (14 of the 42); however, one event occurred even before induction of anaesthesia (after tracheal tube was placed by fibreoptic intubation), two events before (during induction of anaesthesia) and seven during airway management. It is also important to mention that nine cases of primary aspiration occurred before induction as well as before and during airway management emphasising the need for consideration of a quick method of induction of anaesthesia to minimise the time the airway is unprotected.

NAP4 identified several cases where the omission of RSI was responsible for patient harm and death from aspiration of gastric contents or blood. The investigators concluded that: “Rapid sequence induction with cricoid force does not provide 100% protection against regurgitation and aspiration of gastric contents, but remains the standard for those patients at risk.”

The finding that a majority of cases (13 cases) of primary aspiration occurred in patients during maintenance of anaesthesia with supraglottic airway devices is relevant to arguments concerning CP. The data suggest that (a) tracheal intubation should better have been employed and (b) aspiration is an ever-present risk.

NAP4 found no cases where CP was reported to lead to major complications. The experts conceded that RSI with CP does not provide 100% protection from regurgitation and aspiration, but felt it should remain the standard of care for high risk patients. In other words, the experts who reported for NAP4 accepted the problems with CP, but did not recommend avoiding it. Only when intubation fails did they recommend that CP should be reduced or removed to facilitate oxygenation.

6. Medicolegal

Adverse effects in anaesthesia clearly have medicoloegal implications for all those involved. According to Lerman guidelines in anaesthesia endorse CP and its omission legally represents poor practice.[15]

The case of M. v East Hertfordshire Health Authority 1991 probably settled the medicolegal status of CP, at least in the UK (*anaesthetics.ukzn.ac.za/Libraries/.../A_Dunpaths_fmm_booklet.sfl-b.ashx*).[53] Mr M, a 68 year old man, presented for emergency correction of an irreductable inguinal hernia. The anaesthetist, although aware of the history of vomiting, failed to apply cricoid pressure during induction. M regurgitated the contents of his stomach which entered his lungs and pneumonitis resulted. M recovered after a prolonged period in intensive care, but was left symptomatic with breathlessness and had to give up work. The lawsuit was settled in his favour for £42,500. The judge argued that “We cannot assert that CP is not effective until trials have been performed, especially as it is an integral part of anaesthetic technique that has been associated with a reduced maternal death rate from aspiration since the 1960's.”

Marcus has reported that lawsuits on behalf of patients who aspirate their stomach contents during or shortly after surgery are nearly twice as likely to involve the death of the patient as other malpractice claims related to anaesthesia http://www.anesthesiologynews.com/ViewArticle.aspx?d_id=1&a_id=15888&ses=ogst). A publication from the American Society of Anesthesiologists closed claims practice group reported that CP was ‘used’ in half of claims relating to aspiration.[54] Claims for aspiration in which CP was applied were settled for lower amounts than those in which it was omitted. This clearly indicates that the majority of anaesthetists as well as hospitals, lawyers and patients still accept it as the standard of care during RSI and its use is still considered mandatory in patients at high risk of regurgitation.

7. Summary

This article was written as a pro- and con-debate, with us tasked to take the side of pro- CP. Readers will easily see that we have in fact taken a balanced stance.

Aspiration remains an important risk and cause of mortality. CP was designed to prevent aspiration during induction: yet is it not 100% effective and it is often administered suboptimally. Further research should define the components of an RSI (e.g. should mask ventilation be used whilst awaiting full muscle relaxation, etc) and also the degree to which administered a 40N pressure has the same effect in all patients. It is unlikely that an RCT can be conducted, but large datasets like NAP4 may be useful is ascertaining benefit.

Role of funding

No external funding received.

Conflict of interest

No competing interests were declared by the authors.

References

1. Patten SP. Educating nurses about correct application of cricoid pressure. *Assoc Perioper Registered Nurses J* 2006;**84**:449–61.
2. Sellick BA. Cricoid pressure to control regurgitation of stomach contents during induction of anaesthesia. *Lancet* 1961;**19**:404–6.
3. Mendelson CL. The aspiration of stomach contents into the lungs during obstetric anaesthesia. *Am J Obstetrics Gynecol* 1946;**52**:191–205.

Please cite this article in press as: Athanassoglou V, Pandit JJ, Cricoid pressure: The case in favour, Trends in Anaesthesia and Critical Care (2015), http://dx.doi.org/10.1016/j.tacc.2015.02.001

4. Levitan RM, Kinkle WC, Levin WJ, Everett WW. Laryngeal view during laryngoscopy: a randomized trial comparing cricoid pressure, backward-upward rightward pressure, and bimanual laryngoscopy. *Ann Emerg Med* 2006;**47**:548–55.
5. Department of Health *Report on confidential enquiries into maternal deaths in England and Wales 1964–1966*. London: HMSO; 1969.
6. Confidential Enquiry into Maternal and Child Health. Why mothers die 1997–1999. The fifth report of the confidential enquiries into maternal deaths in the United Kingdom. London: RCOG; 137–138.
7. Confidential Enquiry into Maternal and Child Health. Why Mothers Die 2000–2002. The sixth report of the confidential enquiries into maternal Deaths in the United Kingdom. London: RCOG; 128.
8. Lewis G, editor. *The confidential enquiry into maternal and child health (CEMACH). Saving mothers' lives: reviewing maternal deaths to make motherhood safer: 2003–2005. The seventh report on confidential enquiries into maternal deaths in the United Kingdom*. London: CEMACH; 2007.
9. Centre for Maternal and Child Enquiries (2011). Saving mothers' lives: reviewing maternal deaths to make motherhood safer: 2006–2008. *BJOG An Int J Obstetrics Gynaecol* 2011;**118**:1–203. http://dx.doi.org/10.1111/j.1471-0528.2010.02847.x.
10. Rosen M. Anesthesia for obstetrics. *Anaesthesia* 1981;**36**:145–6.
11. Walz JS, Zayaruzny M, Heard SO. Airway management in critical illness. *Chest* 2007;**131**:608–20.
12. Kluger MT, Short TG. Aspiration during anaesthesia: a review of 133 cases from the Australia Anaesthetic Incident Monitoring Study (AIMS). *Anaesthesia* 1999;**54**:19–26.
13. Sakai T, Planinsic RM, Quinlana JJ, Handley LJ, Kim T-Y, Hilmi IA. The incidence and outcome of perioreative pulmonary aspiration in a university hospital: a 4-year retrospective analysis. *Anesth Analgesia* 2006;**103**:941–7.
14. Neilipovitz DT, Crosby ET. No evidence for decreased incidence of aspiration after rapid sequence induction. *Can J Anesth* 2007;**54**:748–64.
15. Lerman J. On cricoid pressure: 'May the force be with you'. *Anesth Analgesia* 2009;**109**:1363–6.
16. Ellis DY, Harris T, Zideman D. Cricoid pressure in the emergency department rapid sequence tracheal intubations: a risk-benefit analysis. *Ann Emerg Med* 2007;**50**:653–65.
17. Brimacombe JR, Berry AM. Cricoid pressure. *Can J Anaesth* 1997;**44**:414–25.
18. Cook TM, Godfrey I, Rockett M, Vanner RG. Cricoid pressure: which hand? *Anaesthesia* 2000;**55**:648–53.
19. Fenton PM, Reynolds F. Life-saving or ineffective? An observational study of the use of cricoid pressure and maternal outcome in an African setting. *Int J Obstetric Anaesth* 2009;**18**:106–10.
20. Vanner RG. Cricoid pressure. *Int J Obstetric Anesth* 2009;**18**:103–5.
21. Tourtier JP, Compain M, Petitjeans F, et al. Acid aspiration prophylaxis in obstetrics in France: a comparative study of 1988 vs. 1998 French practice. *Eur J Anaesthesiol* 2004;**21**:89–94.
22. Oehlkern L, Tilmant C, Gindre G, et al. Is cricoid pressure efficient? The first evidence. *Anesthesiology* 2003;**99**:A1235.
23. Holmes N, Martin D, Begley A-M. Cricoid pressure: a review of the literature. *J Perioper Pract* 2011;**21**:234–8.
24. Vanner RG, Asai T. Safe use of cricoid pressure. *Anaesthesia* 1999;**54**:1–3.
25. Borland LM, Sereika SM, Woelfel SK, Saitz EW, Carrilo PA, Motoyama EK. Pulmonary aspiration in pediatric patients during general anesthesia: incidence and outcome. *J Clin Anesth* 1998;**19**:95–102.
26. Warner MA, Warner ME, Warner DO, et al. Perioperative pulmonary aspiration in infants and children. *Anesthesiology* 1999;**90**:66–71.
27. Warner MA, Warner ME, Weber JG. Clinical significance of pulmonary aspiration during the perioperative period. *Anesthesiology* 1993;**78**:56–62.
28. Olsson GL, Hallen B, Hambraeus-Jonzon K. Aspiration during anaesthesia. A computer-aided study of 185 358 anaesthetics. *Acta Anaesthesiol Scand* 1986;**30**:84–92.
29. Mellin-Olsen J, Fasting S, Gisvold SE. Routine preoperative gastric emptying is seldom indicated. A study of 85,594 anaesthetics with special focus on aspiration pneumonia. *Acta Anaesthesiol Scand* 1996;**40**:1184–8.
30. Engelhardt T, Webster NR. Pulmonary aspiration of gastric contents in anaesthesia. *Br J Anaesth* 1999;**83**:453–60.
31. Phillips S, Daborn AK, Hatch DJ. Preoperative fasting for paediatric anaesthesia. *Br J Anaesth* 1994;**73**:529–36.
32. La Rosa M, Piva L, Dindelli M, Pagnoni B. Aspiration syndrome in Cesarean section. Our experience from 1980 to 1990. *Minerva Anestesiol* 1992;**58**:1213–20.
33. Soreide E, Bjornestad E, Steen PA. An audit of perioperative aspiration pneumonitis in gynecological and obstetric patients. *Acta Anaesthesiol Scand* 1996;**40**:14–9.
34. Stept WJ, Safar P. Rapid induction/intubation for prevention of gastric-content aspiration. *Anesth Analgesia* 1970;**49**:633–6.
35. Fanning GL. The efficacy of cricoid pressure in preventing regurgitation of gastric contents. *Anesthesiology* 1970;**32**:553–5.
36. Salem MR, Joseph NJ, Heyman HJ, et al. Cricoid compression is effective in obliterating the esophageal lumen in the presence of a nasogastric tube. *Anesthesiology* 1985;**63**:443–6.
37. Vanner RG, Pryle BJ. Regurgitation and oesophageal rupture with cricoid pressure: a cadaver study. *Anaesthesia* 1992;**47**:732–5.
38. Neelakanta G. Cricoid pressure is effective in preventing esophageal regurgitation. *Aneesthesiology* 2003;**99**:242.
39. Smith KJ, Dobranowski J, Yip G, Dauphin A, Choi PT-L. Cricoid pressure displaces the esophagus: an observational study using magnetic resonance imaging. *Anaesthesiology* 2003;**99**:60–4.
40. Smith KJ, Ladak S, Choi PT, et al. The cricoid cartilage and the esophagus are not aligned in close to half of adult patients. *Can J Anesth* 2002;**49**:503–7.
41. Meek T, Gittins N, Duggan JE. Cricoid pressure: knowledge and performance amongst anaesthetic assistants. *Anaesthesia* 1999;**54**:59–62.
42. Stanton J. Literature review of safe use of cricoid pressure. *J Perioper Pract* 2006;**16**:250–7.
43. Lawes EG, Campbell I, Mercer D, et al. Inflation pressure, gastric insufflation and rapid sequence induction. *Br J Anaesth* 1987;**59**:315–8.
44. Moynihan RJ, Brock-Utne JG, Archer JH, et al. The effect of cricoid pressure on preventing gastric insufflation in infants and children. *Anesthesiology* 1993;**78**:652–6.
45. Petito SP, Russell WJ. The prevention of gastric inflation—a neglected benefit of cricoid pressure. *Anaesth Intensive Care* 1988;**16**:139–43.
46. Sellick BA. The prevention of regurgitation during induction of anaesthesia. *First Eur Congr Anaesthesiol* 1962;**89**:1–4.
47. Whittington RM, Robinson JS, Thompson JM, et al. Fatal aspiration (Mendelson's) syndrome despite antacids and cricoid pressure. *Lancet* 1979;**2**:228–30.
48. Williamson R. Cricoid pressure. *Can J Anesth* 1989;**36**:601.
49. Howells TH, Chamney AR, Wraight WJ, et al. The application of cricoid pressure: an assessment and a survey of its practice. *Anaesthesia* 1983;**38**:457–60.
50. Cook TM, McCrirrick A. A survey of airway management during induction of general anaesthesia in obstetrics: are the recommendations of the confidential enquiries into maternal deaths being implemented? *Int J Obstetric Anesth* 1994;**3**:143–5.
51. Sury MRJ, Palmer JHMG, Cook TM, Pandit JJ. The State of UK anaesthesia: a survey of National Health Service activity in 2013. *Br J Anaesth* 2014. http://dx.doi.org/10.1093/bja/aeu292.
52. Fourth National Audit Project. *Major complications of airway management in the UK. Report and findings of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society*. March 2011.
53. M. v East Hertfordshire Health Authority. *Clinical negligence cases: anaesthesia claim*. Available from:. 1991. www.ffw.com/feature/clinicalnegligence-cases–;-an.aspx [Accessed May 2011].
54. Bailie R, Stephens L, Warner M, Warner M, Domino K. Liability and risk factors associated with aspiration: closed claims analysis. In: *ASA annual congress*; 2010. abstract a789.

Please cite this article in press as: Athanassoglou V, Pandit JJ, Cricoid pressure: The case in favour, Trends in Anaesthesia and Critical Care (2015), http://dx.doi.org/10.1016/j.tacc.2015.02.001