Reviewer’s report

Title: A randomised, controlled crossover comparison of the C-MAC videolaryngoscope with direct laryngoscopy in 150 patients during routine induction of anaesthesia

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Reviewer: David Ray

Reviewer’s report:

The authors describe the use of a new videolaryngoscope (the C-MAC) and compare its performance with direct laryngoscopy in 150 patients. The article is original, interesting, and adds to the current information available about alternative laryngoscopy techniques. The paper suggests that the C-MAC may be a useful addition to the range of airway devices but there are a number of limitations which the authors should address:

Major compulsory revisions:

1. The authors’ conclusion that the C-MAC may serve as a standard intubation device is not supported by their data. The laryngoscopic view obtained using the C-MAC is usually as good as, or better than using direct laryngoscopy. However, tracheal intubation is not as good as using direct laryngoscopy - from the authors own data 26% of patients required more than 1 attempt to successfully intubate the trachea using the C-MAC compared with only 4% using the standard Macintosh laryngoscope (Fishers exact test P=0.0007). In addition a gum elastic bougie was used in 12% of patients intubated using the C-MAC compared to 2% using direct laryngoscopy. Although the median times taken to intubate were similar for all devices, these data suggest that the laryngoscopic view may be improved but tracheal intubation may be more difficult (this is consistent with the performance of many other videolaryngoscopes). This may reflect the subjective assessment of the handling of the C-MAC (38% very good, 13% poor) compared to 57% very good and 7% poor for the standard Macintosh laryngoscope. Technical difficulties (dazzling and fogging of the lens) were experienced in 13 of 150 (9%) uses of the C-MAC, suggesting an important limitation with the current C-MAC technology. The authors should temper their conclusions and enthusiasm for the C-MAC accordingly.

2. It is not clear from the manuscript what the primary outcome measure was - was it laryngoscopy view or time taken to intubate the trachea? Similarly there is no information on how the authors decided on the number of patients they required to study.

3. It is not clear whether the "optimal" views obtained at laryngoscopy were with or without external laryngeal manipulation.

Minor essential revisions:
1. It is not entirely clear from the text that each patient underwent laryngoscopies using each of the 3 devices - this should be made explicit.

2. What was the size of the blade used for direct laryngoscopy with the standard Macintosh?

3. How did the authors confirm successful endotracheal placement - was it seeing the tube pass through the vocal cords, or confirmation using capnography?

4. The term "optimal laryngoscopy" is inaccurate and should be replaced with "best laryngoscopic view" if that is what the authors mean.

5. The term "complicated airway" suggests that the authors consider a Cormack & Lehane grading of more than 1 as a complicated airway - 16 of these 24 patients were C&L grade 2a or b which I would not consider complicated.

6. Table 1 may be more useful if body mass index was shown rather than weight and height. It would be more informative to show the data separately for the groups of patients intubated with each device.

7. Figures 2, 3 and 4 are labelled incorrectly. Figure 3b is not particularly helpful - a graph showing the individual changes for each of the 8 laryngoscopies would be more instructive.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I have assisted Aircraft Medical (Edinburgh, UK) in the development of the McGrath videolaryngoscope. My employing authority has received payment from Aircraft Medical for my professional advice given on a consultative basis.