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Title: Time to Intubation with McGrath^(TM) Videolaryngoscope versus Direct Laryngoscope in Powered Air-Purifying Respirator (TIVIDI) : a randomised controlled trial

Aim: During the coronavirus disease 2019 (COVID-19) pandemic, multiple guidelines have recommended the videolaryngoscope for tracheal intubation. However, there is no evidence that the videolaryngoscope reduces the time to tracheal intubation when personal protective equipment is donned.

Methodology: To simulate intubation of COVID-19 patients, we randomised 28 elective surgical patients to be intubated with either the McGrath^(TM) MAC videolaryngoscope or the direct laryngoscope by specialist anaesthetists who were donned in 3M^(TM) Jupiter^(TM) powered air-purifying respirators (PAPR) and N95 masks. We set up a video camera to record the intubation processes with a calibration ruler so that the recordings were reviewed to determine the intubation duration and to measure the closest distance between the patient's and anaesthetist's mouths. Primary outcome was the time to intubation which is important for COVID-19 patients with respiratory failure.

Results: The median (IQR) times to intubation were 61s (37-63s) and 41.5s (37-56s) in the videolaryngoscope and direct laryngoscope groups respectively ($p=0.35$). The closest mean (SD) distances between the anaesthetist and the patient during intubation were 21.6cm (4.8cm) and 17.6cm (5.3cm) in the videolaryngoscope and direct laryngoscope groups respectively ($p=0.045$). There were no significant differences in the median intubation difficulty scale scores, proportion of successful intubation at first laryngoscopic attempt and proportion of intubations requiring adjuncts. Intubations for all the patients were successful with no adverse event.

Conclusion: There was no significant difference in the time to intubation by specialist anaesthetists who were donned in PAPR and N95 masks on elective surgical patients with either the McGrath (™) videolaryngoscope or the direct laryngoscope. The distance between the anaesthetist and the patient was significantly further with the videolaryngoscope. As the ongoing pandemic had caused supply chain disruptions, we should strive to validate equally efficacious and safe alternatives, such as considering the direct laryngoscope as a comparable alternative to the videolaryngoscope.