A Comparison of Conventional and Videolaryngoscopy Blades in Neonates

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BACKGROUND

Neonatal intubation is an essential but difficult skill to learn. Videolaryngoscopy allows the airway view to be shared by the intubator and supervisor and improves intubation success through its use as a teaching aid. Ideally, a videolaryngoscope (VL) should also be usable as a conventional laryngoscope (CL).

AIM

- To compare CL and VL blades and describe differences in their shape.
- To demonstrate the effect these differences have on the direct view of the vocal cords obtained.

METHOD

Comparison of three brands of single-use CL Miller blades in sizes 00, 0, and 1; Callisto (TIMESCO), Metal max disposable combi laryngoscope set (PROACT) and Metal max 100 (PROACT), with three brands of VL Miller blades available in the UK; InfantView (ACUTRONIC) re-usable blades, sizes 00, 0 and 1, C-MAC (Storz) re-usable blades, sizes 0 and 1 and C-MAC (Storz) single-use blades, sizes 0 and 1. The shapes of the blades were compared in different aspects and the observed differences described.

All blades were used to perform direct laryngoscopy on a preterm manikin. The best airway view was photographed at the intubator's eye level and the corresponding images on the VL monitors were also photographed.

RESULTS

The CL blades are demonstrated in figure 1 and the VL blades in figure 2. On comparison of CL with VL blades, three main differences were observed:

- 1) The tips of the VL blades (fig 2.i) are more curved compared to the CL blades' straighter tips (fig 1.i)
- 2) The floor of the body of the VL blades has a midline trough running the length of the blade (fig 2.ii), whereas the floor of the body of CL blades is flat (fig 1.ii)
- 3) The overall vertical height of the VL blades (fig 2.iii) is less than that of the CL blades (fig 1.iii), due to the presence of a ledge above the light source in the CL blades (fig 1.v), that is missing in the VL blades.

These differences impact on the direct vocal cord view obtainable with a VL compared with the views obtainable using a CL (fig 3.a-c). The reduced overall vertical height of the VL blades in particular results in a shorter, narrower and more restricted view of the oropharynx on direct laryngoscopy with a VL (fig 3.d-f), although the view on the monitor is well maintained (fig 3.g-i).

When using a VL, an assistant lifting the infant's top lip expands the direct airway view and the space available for passing an endotracheal tube increased (figure 3.j-l).

Figure 1

Figure 2

Figure 3

CONCLUSION

VL blades available in the UK have several important differences in their design when compared to CL blades. These differences impact on the direct airway view obtainable with a VL. Ideally, neonatal VL blades would be functionally the same as CL blades to optimise the use of videolaryngoscopy in teaching neonatal intubation.