

DEVICES FOR LESS INVASIVE SURFACTANT THERAPY: A MANIKIN STUDY

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Background: “Less invasive surfactant therapy” (LIST), or tracheal instillation of surfactant through a small catheter in spontaneously breathing infants, is gaining popularity. Different catheters are currently used for this purpose: a nasogastric tube inserted with (LISA) or without (Take Care) Magill’s forceps, a 13 cm 16G adult angiocath (MIST), a 30 cm F4 angiography catheter (Stockholm). We developed a specific device by combining a F5 umbilical catheter and an intubation stylet (Liege). We aimed to compare those 5 devices using INSURE as a reference.

Methods: 20 neonatologists from 4 institutions supporting different surfactant instillation policies intubated 2 manikin heads with the 5 catheters and an endotracheal tube in a predetermined random sequence. Water was flushed through the catheter. Video review provided times between laryngoscope (T1) or catheter insertion (T2) in the mouth and water flowing from the trachea. Participants gave an ease of use score (range: 1-9) for each catheter.

Results: Procedural times were longer with the Take Care method and shorter with the Liège device (Table). Failure rates were higher for LIST procedures than for INSURE. Take Care and LISA were rated as more difficult, while Liège, Stockholm and INSURE were considered easier.

| median (IQR) | LISA (a) | Take Care (b) | MIST (c) | Stockholm (d) | Liège (e) | INSURE (f) | Friedman ANOVA |
|-----------------------------|----------------|------------------|----------------|------------------|----------------|---------------------------|-------------------|
| T1: blade> water | 24s (19-38) | 30s (22-58) | 17s (10-31) | 23s (11-37) | 17s (13-27) | 19s (13-26) | p<0.0001 |
| Wilcoxon test: p <0.05 | vs ef | vs cdef | vs b | vs b | vs ab | vs ab | |
| T2: device>water | 14s (11-22) | 21s (13-43) | 10s (5-24) | 15s (7-23) | 9s (6-14) | 10s (8-18) | p<0.0001 |
| Wilcoxon test: p <0.05 | vs bef | vs acdef | vs be | vs be | vs abcd | vs ab | |
| Ease of use score: (1-9) | 5 (4-6) | 3 (2-4) | 6.5 (5-7) | 7 (4-8) | 8 (6.5-8) | 7 (6-8) | p<0.0001 |
| Wilcoxon test: p <0.05 | vs bcdef | vs acdef | vs ab | vs abe | vs abd | vs ab | |
| Failed attempts (/40) | 7 | 6 | 8 | 4 | 3 | Cochran Q test: p=0.38 | |

Conclusions: LIST procedures remain difficult, even on a manikin. The choice of catheter is important. A device combining the rigidity of a stylet with the soft distal end of an umbilical catheter is associated with procedures of shorter duration and is considered easier by neonatologists.