Utility of ultrasound of upper airway for confirmation of endotracheal intubation and confirmation of the endotracheal tube position in ICU

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Argomento: Altro

Background: Endotracheal intubations in the ICU are extremely high risk procedures and Rapid confirmation of Endotracheal tube (ETT) placement is vitally important so is the correct depth placement of the tube. We conducted this study to evaluate the efficacy of Airway Ultrasonography for real time confirmation of ETT placement and also to confirm appropriate depth of the tube

Methods: In this prospective, single-centre study over one year period, we included patients above 18 years intubated in the ICU. We performed bedside airway ultrasonography during intubation and confirmed ETT placement by loss of snowstorm sign.We used saline filled cuff method to place Endotracheal tube depth at 3^{rd} to 4^{th} tracheal ring and confirmed the appropriateness on chest xray.We calculated the sensitivity ,specificity and appropriateness of snow storm sign for the confirmation of ETT placement and compared Endotracheal tube depth by saline filled cuff technique to chest xray.

Results: We included 91 patients. The ultrasound confirmation of the Endotracheal tube with the loss of snow storm sign was seen in 88 patients .The incidence of Esophageal intubations was 2.1%. The overall sensitivity of airway ultrasound for confirmation of ETT placement was 96% (CI 0.89 -0.99) and specificity 100 %. The PPV of 100% (CI 0.94-1.00) and NPV of 40% (CI 0.07 to 0.80). The Accuracy of Endotracheal tube position by ultrasound saline cuff as compared to chest x-ray was 96% (CI 0.71-0.87).

Conclusions: Our study concluded that bedside ultrasonography can be used for rapid confirming ETT placement as well as for appropriate final positioning of tube.

Table 1 Accuracy of snow storm sign

	Esophageal Intubation	Endotracheal Intubation	Capnography confirmed ETT placement
Snowstorm sign Test Positive	0	86	
Snowstorm sign Test Negative	2	3	91
Total Intubations (N =91)	2	89	
	Estimated	95% CI	
	Value	Lower Limit	Upper Limit
Prevalence	0.978022	0.915329	0.996184
Sensitivity	0.966292	0.897721	0.991254
Specificity	1	0.197868	1
PPV	1	0.946719	1
NPV	0.4	0.072584	0.829576
Accuracy of snow storm sign	0.967		