

MEETING ABSTRACTS

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Oral Communications

COK-1

Expiratory muscle weakness quantified by maximal expiratory pressure may be insufficient in predicting critical outcomes in mechanically ventilated patients

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Rationale: Expiratory muscles has recently been stated as the «neglected component» in mechanically ventilated patient. Several authors stated these muscles importance in cough capacity, contractile efficiency of the diaphragm or reduction of hyperinflation. However, few studies reported potential factors leading to expiratory muscle weakness and its importance on weaning success or survival after mechanical ventilation.

Patients and methods: This study is a secondary analysis of our previously described cohort of 124 patients ventilated for at least 24 h assessed for respiratory muscles function. Maximal expiratory pressure (MEP) measurement was carried out during spontaneous breathing trial using

a manometer with an unidirectional valve. MEP diagnostic accuracy to predict ICU-AW (ICU acquired weakness), weaning success and survival within 30 days were assessed using expiratory muscle strength as absolute values (cmH₂O), as %predicted values and as %lower limit of normal.

Results: Due to the paucity of data reporting threshold value for expiratory muscle weakness, we considered our median value (47 cmH₂O (IQR 44)) as the threshold value for expiratory muscle weakness group (MEP ≤ 47 cmH₂O) and normal expiratory muscle group (MEP > 47 cmH₂O). Patients with low MEP received more catecholamines (p=0.04) and a higher duration of mechanical ventilation (p=0.001). Inversely, higher body mass index was associated with higher MEP. Patients with low MEP presented more ICU-AW compared to normal MEP patients (64% vs. 35%; p=0.003). No other outcomes were different between groups. MEP was statistically able to predict ICU-AW but area under (AUC) receiving operating curves showed weak predictive ability (AUC: 0.66 (95% IC 0.55–0.77; p<0.01) for a threshold value ≤ 49 cmH₂O. Expiratory muscle weakness was unable to predict critical outcomes when adjusting MEP to the %predicted or lower limit of normal.

Discussion: Possible explanation is that contrary to inspiratory muscle weakness, cough inefficacy after weaning from mechanical ventilation could be managed with cough supplementation techniques (*i.e.* mechanical in-exsufflation).

Conclusion: In our cohort, MEP was not associated with mechanical ventilation weaning or death. Despite our results, different clinical techniques for quantifying expiratory muscle weakness may provide more beneficial results.

Compliance with ethics regulations: Yes

Table 1 Patients' outcomes

Outcomes	Low MEP N = 63	Normal MEP N = 61	Risk Ratio [95% IC]	p value
Extubation failure, n (%)	14 (22)	8 (13)	1.32 (0.91–1.93)	0.18
Death within 30 days, n (%)	10 (16)	5 (8)	1.37 (0.91–2.06)	0.19
ICU-AW, n (%)*	32 (64*)	17 (35*)	1.82 (1.19–2.77)	0.003
Readmission in ICU within 30 days, n (%)	1 (2)	1 (2)	0.98 (0.24–3.98)	0.98

CI: Confidence interval; ICU-AW: Intensive care unit acquired weakness; MEP: Maximal expiratory pressure; *99/124 has been assessed for ICU-AW (MRC score)