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Title: A new method to measure cough pressure in intubated patients. Validity and usefulness as a predictor of extubation failure in ICU patients having succeded a spontaneous breathing trial

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Body: We aimed to validate a new equipment and method to measure cough pressure developed at the tube cuff as a predictor of successful extubation in a Burn ICU. Methods: once extubation criteria met and a spontaneous breathing trial succeded, we measured: cough pressure with a new device (mmHg)(CPd), cough pressure with a commercial handheld dynamometry (mmHg)(CPhhd), and used a BICORE to measure Cough Peak Flow (L/sec)(CpF), Maximal Inspiratory Pressure (mmHg)(MIP), Tidal Volume (mL)(Vt), Respiratory Rate (RR). Extubation failure expressed the reintubation within the 48 hours. We measured morphine dose 4 hours prior extubation and clinical characteristics. T test (Bonferroni corrected), Pearson correlation, Bland Altmann agreement and multiple regression analysis were used. Results: We studied 40 patients, 39,5 ± 25,7 years old. Admission criteria: inhalation injury in 38 cases and polyvalent disease in 2 cases. 4 patients failed extubation (10%). CPd vs CPhhd comparaison showed a significant correlation (r=0,91) and a Bland – Altmann plot analysis of the differences showed significant agreement. CPd and CPF showed a significant correlation. Patients succeded vs failed showed: Ve 2.9 ± 0.99 vs 2.4 ± 0.28 (*), CPF 1.47 ± 0.13 vs 1.23 ± 0.15 (*), MIP 38.2 ± 3.36 vs 31.0 ± 2.94 (*). CPd 54.5 ± 9.3 vs 23.0 ± 3.5 (*). CPd best related to extubation success (*). Dose of morphine (mg) was 1,20 ± 0,77 vs 2,60 ± 0,66 (*). (*) means p minor 0,05. Conclusions: We could perform and validate the method, and CPd was the best extubation success predictor. A hypodynamic scenario was due to sedative agents.