Author	Year	Location	Study design	Study aims	Population	n	Intervention/Protocol	Outcome measures	Result
Nunes	2019	Brazil	Randomised crossover study	To evaluate effects of MI-E on respiratory mechanics haemodynamic and clearance of bronchial secretions.	Adults (>18 years) On MV > 24hrs via OTT Mixed diagnosis	16	Three protocols, 3-hr application interval: 1.MI-E (+30/-30) plus endotracheal suctioning; 2.MI-E (+50/-50) plus endotracheal suctioning; and 3.isolated endotracheal suctioning MI-E set up: Auto mode. Ti 2.5s and Te 1.5s, 0.5s pause. 4 sequences of 4 respiratory cycles and a 20 sec interval between each sequence Treatment applied by a physiotherapist.	Parameters evaluated: -5 min before -Immediately after -10 min after HR SBP DBP S_PO_2	No significant difference in HR across protocols (p=0.2) SBP and DBP significantly increased immediately after MI-E (+30/-30cmH_2O) and execution of isolated endotracheal suctioning (p=0.0006*) SpO_2 significantly reduced immediately after both the use of I/E pressures of +30/-30cmH_2O and the execution of isolated endotracheal suctioning (p=0.0001*) The execution of I/E with pressures +50/-50 cmH_2O did not result in significant changes in SBP, DBP or SpO_2.

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Coutinho	2018	Brazil	Randomised crossover study	To compare the effects of MI-E verses isolated conventional tracheal suctioning on respiratory mechanics, haemodynamic stability, and aspirated secretion volume	Adults (>18 years) On MV > 48hrs Mixed diagnosis	43	Two protocols (intervention v control) Intervention: MI-E (+40/-40) 5 times in 4 cough cycles Automatic mode Ti/Te 3s, without pause. with tracheal suctioning Control - Conventional tracheal suctioning	Parameters evaluated: Before 1 min after 15 min after 30 min after HR SBP DBP MAP RR SpO_2	No significant difference over time or between groups in HR, MAP, RR and SpO_2.
Ferreira de Camillis	2018	Brazil	Randomised parallel-group, open label trail	To evaluate effectiveness of MI-E with respiratory physiotherapy v respiratory physiotherapy alone based on the weight of aspirated airway secretions	Adults (>18 years) On MV> 24hrs via ETT Medical and surgical cohort (haemodynamically stable)	180	Intervention v control Intervention: MI-E (+40/-40) 3 sets of 10 cycles Ti2s and Te3s, 2s pause, followed by orotracheal suction. Control – bilateral compression and manual vibration followed by manual hyperinflation and orotracheal suction Treatment applied by a physiotherapist	Parameters evaluated: 5 min before 5 min after WOB Ventilator adverse event 'decrease in SaO_2 by 3%' Haemodynamic adverse event 'SBP <90mmHg'	No difference in WOB between two groups No haemodynamic or ventilatory adverse events were observed

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Martínez-Alejos	2021	France	Prospective single-blind randomised crossover trial	To evaluate the efficacy and safety of MI-E combined with expiratory. rib cage compressions	Adults (>18 years) On MV > 48hrs via ETT Mixed diagnosis	26	Two protocols, 4-hr washout interval: Control: ERCC followed by endotracheal suction Intervention: ERCC plus MI-E Pressures (+40/-40) 4 series of 5 I-E cycles, with a 1 min pause between series. Medium inspiratory flow I-E time 3s and 2s, 1s pause. Automatic mode Followed by endotracheal suction Treatment applied by an experienced respiratory physiotherapist.	Parameters evaluated: Before During After HR SBP DBP PaO_2 $PaCO_2$ SaO_2	HR significantly increased in both treatment arms. SaO_2 significantly increased after 1hour in the ERCC+MI-E group (p=0.03*) PaO_2 significantly increased after the ERCC+MI-E intervention (p=0.003*) A total of 21 episodes of brief desaturations or haemodynamic variations were documented: 10 during ERCC+MI-E 11 during ERCC (no significant difference between interventions)

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Sánchez-García	2018	Spain	Case series	To evaluate the safety of MI-E use in the intubated	Adults (>18 years) On MV via ETT/ tracheostomy	13	MI-E with I/E pressures of +50/-45 cmH_2O, with oscillations at 16Hz Cycles of 10-12 I-E time – 3s and 4s	Parameters evaluated: At baseline Immediately before 5 min after	No statistically significant difference in HR, MAP, $PaCO_2$ and RR between time points

				patient population	Mixed diagnosis (Post operative, Medical Trauma)		followed by endotracheal/tracheal suction	60 min after HR MAP SaO_2 PaO_2 $PaCO_2$ RR	SaO_2 and PaO_2 significantly increased from baseline (p=0.04* and p=0.031* respectively) One episode of raised ICP (from 17cmH_2O to 28cmH_2O)

Abbreviations: **cm$H_2$0** – centimeters of water; **DBP** – Diastolic Blood Pressure; **ERCC** – Expiratory Rib Cage Compressions; **ETT** – Endotracheal Tube; **HR** – Heart Rate; **Hrs** – Hours; **Hz** – hertz; **ICP –** Intracranial Pressure; **I/E** - Insufflation/Exsufflation; **MAP** – Mean Arterial Pressure; **MI-E** – Mechanical Insufflation-Exsufflation; **min** – minute; **MV** – Mechanical Ventilation; **OTT** – Orotracheal Tube; **$PaCO_2$** – Partial Pressure of Carbon Dioxide; **PaO_2** – Partial Pressure of Oxygen; **RR** – Respiratory Rate; **s** – second; **SaO_2** – Oxygen Saturation Level; **SBP** – Systolic Blood Pressure; **SpO_2** – Oxygen Saturation; **Ti** – Inspiratory Time; **Te** – Expiratory Time; **WOB** – Work of Breathing; * statistically significant finding