

Correlation of End-Tidal Carbon Dioxide Tension with Arterial Carbon Dioxide Tension in Patients with Respiratory Failure on Mechanical Ventilation

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ABSTRACT

Background: Patients undergo mechanical ventilation need continuous evaluation of their respiratory condition. Monitoring of end-tidal carbon dioxide (ETCO₂) as noninvasive measurement of arterial carbon dioxide (PaCO₂) is a good tool for assessment and management of mechanically ventilated patients.

Aim of the work: The aim of this work is to correlate expiratory end-tidal carbon dioxide tension with arterial carbon dioxide tension in patients with respiratory failure on mechanical ventilation and its significance.

Patients and methods: This study was carried out on 50 patients on invasive mechanical ventilation with acute or acute on top of chronic respiratory failure admitted to respiratory I.C.U. at Bab El- Shaeria University Hospital, Studied patients had obtained two ABG samples one at the onset of mechanical ventilation (M.V.) and the second when the patient was on weaning mode of mechanical ventilation with continuous capnographic monitoring [ISA sidestream gas analyzer]and reading record at the onset of ABG sampling.

Results: The study include 31 males (62%),and 19 female (38%),24 patients (48%) had C.O.P.D, 9 patients (18%) had pneumonia, 8 patients (16%) had O.H.S, 7 patients (14%) had I.L.D and2 patients (4%) had acute severe asthma. The study shows no statistical significant difference between PaCO₂ and ETCO₂ at the onset of mechanical ventilation (74.78 ± 20.19 and 67.5 ± 19.23) mmHg and on weaning mode (43.98 ± 8.07 and 42.2 ± 7.2) mmHg. That PaCO₂ measurements vary approximately 2-7 mmHg above ETCO₂ values which mean good correlation between PaCO₂ and ETCO₂.

Conclusion: ETCO₂ measurement provides an accurate estimation of PaCO₂ in ventilation and weaning which may reduce the need for invasive, high cost monitoring and repeated arterial blood gas analyses.