

BLOOD GAS AND ACID-BASE BALANCE VALUES OF CAPILLARY BLOOD AND THEIR CORRELATION WITH THE RESULTS OF CAPNOMETRY IN COPD PATIENTS

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Abstract

Background: Arterial blood gas analysis is the gold standard for gas exchange assessment, but it is invasive and costly technique.

The purpose of the trial was to study the accuracy of non-invasive measurement of gas exchange parameters in COPD patients with the use of capnometry in comparison with blood gas and blood acid-base balance tests.

Methods. A total of 22 subjects (17 male, 5 female) were enrolled (COPD GOLD stage II – 4, GOLD III – 11, GOLD IV – 7 patients). Blood gas and acid-base tests were performed using micromethod technique by analyzer “ABL5” by Radiometer. Capnometry was performed using “Oxycon Pro” system by Cardinal health.

Results. Almost one third of patients had elevated levels of PaCO₂, blood hypocapnia was not detected in any of the patients. Correlation analysis demonstrated statistically significant correlation between CO₂ partial pressure in capillary blood and its end-expiratory partial pressure (PETCO₂) and fractional concentration (FETCO₂), $\rho = 0,466$ and $0,475$, respectively, $p < 0,05$.

Conclusions. Capnometry allows to predict the level of blood hypercapnia at high FETCO₂ using following equation: $\text{PaCO}_2 = 3,6582 \times \text{FETCO}_2 + 25,418$. It also helps to assess lung ventilation disorders in cases of reduced FETCO₂ level.

Key words: chronic obstructive pulmonary disease, blood gas and acid-base balance, capnometry.

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