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중환자실에 입원한 환자에서 시행한 동맥혈 가스 검사와 말초 정맥혈 가스 검사의 일치도

고신의대 내과학교실

박세진, 김성빈, 박진희, 신호식, 노영순, 정연순, 임 학

Agreement between Peripheral Venous and Arterial Blood Gas Measurements in the Intensive Care Unit

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Purpose: Venous blood gas (VBG) analysis is a safer procedure than arterial blood gas (ABG) analysis and may be an alternative for determining acid-base status. The objective of this study was to examine the agreement between ABG and peripheral VBG samples for all commonly used parameters in a medical intensive care unit (ICU) population

Methods: We performed a single-center, prospective trial to assess the agreement between arterial and peripheral VBG measurements in a medical ICU. When an ABG was deemed to be necessary as part of ICU management, a peripheral venous sample was also obtained within 2 minutes to examine the agreement among the pH, PCO_2, bicarbonate and total CO_2. All of the samples were analyzed using the same arterial blood gas analyzer as quickly as possible. A maximum of 5 paired ABG-VBG samples were obtained per patient to prevent a single patient from dominating the data set. Additional data collected on a standardized data collection form included primary diagnosis, intubation status, use of inotropic agents, and hypotension (defined as a systolic BP <90 mmHg).

Results: The mean arterial minus venous difference for pH, PCO_2, and bicarbonate was 0.030, −5.4, and, −1.00, respectively. Regression equations were derived to predict arterial values from venous values as follows: Arterial pH=0.763XpH+1.786, arterial PCO_2=0.611XVenous PCO_2+9.521, arterial bicarbonate=0.822XVenous bicarbonate+2.815 and arterial HCO_3=0.639XVenous total CO_2+5.360. The mean ABG minus peripheral VBG differences for pH, PCO_2, and bicarbonate were not clinically important.

Conclusion: Peripheral venous pH, PCO_2, bicarbonate and total CO_2 can replace their arterial equivalents in many clinical contexts encountered in the ICU.

Key Words: 중환자실, 혈액가스검사, 산도
Intensive care unit, Blood gas analysis, pH