CLINICAL SIGNIFICANCE OF ACID-BASE PARAMETERS IN EMERGENCY DEPARTMENT PATIENT MANAGEMENT

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Background. Acid-base balance (ABB) analysis is a fundamental component in the assessment of critically ill patients in the Emergency Department (ED). It enables rapid identification of metabolic and respiratory disturbances, contributing to the evaluation of case severity and guiding optimal therapeutic management.

Objective(s). This study evaluates the role of acid-base parameters as diagnostic and prognostic markers in Emergency Department patients, aiming to improve diagnosis, monitoring, and clinical management.

Materials and methods. A retrospective analysis was conducted on ABB parameters from 1930 patients admitted to the ED's red zone (out of 2146 total). Parameters assessed included pH, base excess (BE), bicarbonate (HCO_3^-), anion gap (AG), lactate levels, and physicochemical patterns per Stewart's method. Correlations with clinical status and outcomes were examined.

Results. Among the 1930 patients evaluated, 28.4% exhibited severe metabolic acidosis, defined by a base excess (BE) below –6 mEq/L, while 16.2% had elevated lactate levels above 4 mmol/L. Both parameters coexisted in 9.5% of patients and correlated with a mortality rate of 27.1%. An anion gap (AG) exceeding 12 mEq/L was detected in 39.7% of cases, with 61.3% of those also exhibiting hyperlactatemia. In trauma patients, a strong correlation among BE, AG, and lactate ($r > 0.7$) facilitated early shock detection. Stewart's method revealed hidden acid-base disturbances in 14.8% of cases undetected by conventional diagnostic methods.

Conclusion(s). Integrated analysis of ABB parameters—pH, base excess (BE), bicarbonate (HCO_3^-), anion gap (AG), and lactate—is vital for accurate and timely diagnosis in the Emergency Department. Utilizing Stewart's method alongside POCT enhances diagnostic accuracy, guides treatment, and lowers mortality.

Keywords: acid-base balance, emergency department, lactate, base excess

ECHOCARDIOGRAPHIC FEATURES IN THE DIAGNOSIS OF AORTIC STENOSIS

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Background. Aortic stenosis (AS) is a valvular condition that obstructs left ventricular outflow, commonly seen in the elderly and associated with increased morbidity and mortality. Echocardiography remains the standard for early diagnosis, severity assessment, monitoring, and guiding therapeutic management.

Objective(s). Review of the literature on essential echocardiographic features for the diagnosis and staging of aortic stenosis, as well as the predictive value of parameters in therapeutic decision-making.

Materials and methods. A narrative synthesis of relevant scientific articles from the past five years was performed, using databases such as PubMed, HINARI, Scopus, and SAGE. The following main echocardiographic parameters essential for diagnosis were evaluated: aortic valve area (AVA), peak transvalvular jet velocity (Vmax), and mean pressure gradient.

Results. Research noted that mild stenosis is defined by an AVA >1.5 cm^2 and Vmax <3 m/s, moderate stenosis is characterized by an AVA between 1.0–1.5 cm^2 and Vmax 3–4 m/s, severe stenosis by an AVA <1.0 cm^2, Vmax ≥4 m/s, and a mean gradient ≥40 mmHg. In special forms such as low-flow, low-gradient, the AVA is <1.0 cm^2 but with a gradient <40 mmHg, observed in patients with reduced ejection fraction. In these cases, complementary methods like dobutamine stress echocardiography, a functional test for contractility assessment or CT calcium scoring, are necessary to differentiate severe from moderate forms and to guide clinical decisions.

Conclusion(s). Echocardiography enables the early diagnosis of aortic stenosis through the evaluation of AVA, Vmax, and mean gradient, facilitating the identification of severe or atypical forms, guiding therapeutic approaches, and supporting decisions regarding the optimal timing of interventional treatment.

Keywords: aortic stenosis, echocardiography, parameters, diagnosis

CURB-65 OR CURB(S)-65 FOR COMMUNITY-ACQUIRED PNEUMONIA?

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Background. The clinical CURB-65 score is essential for assessing severity and reducing mortality among patients with community-acquired pneumonia (CP) or at increased risk of major complications. Augmenting the existing score with oxygenation parameters (CURB(S)-65) could improve the management of these patients.

Objective(s). Analysis of the specialized literature on the importance of integrating oxygenation parameters into the CURB-65 score and the benefits of the new score in the management of patients with pneumonia.

Materials and methods. A systematic review of the international scientific literature was carried out using specialized electronic databases, including Google Scholar, MEDLINE, PubMed, Wiley Library, Elsevier/Mendeley, and Research4Life, covering the period 2015–2025. The search was guided by the following keywords CURB(S)-65, CURB-65, and community-acquired pneumonia.

Results. Two publications met the search criteria: one article and one abstract. In the analyzed article, patients were divided into two groups based on CURB-65 score: score 0–1(G1) and score ≥2(G2). The mortality rate was higher in G2 patients (12.7% vs. 3.3%), and the number of patients with SaO_2<90% was also more elevated (p=0.009). Univariate analysis showed that PaO_2<60 mmHg and SaO_2<90% were associated with an increased risk of mortality. A comparative analysis of the area under the curve for the CURB-65 and CURB(S)-65 scores showed better accuracy of the CURB(S)-65 score in predicting mortality among patients with community-acquired pneumonia.

Conclusion(s). The addition of oxygenation parameters to the CURB-65 score could contribute to the management of CAP by improving the accuracy of decisions on the need for intensive care unit transfer and initiation of oxygen therapy. Further studies are needed to evaluate the CURB(S)-65 score.

Keywords: CURB-65, CURB(S)-65, community-acquired pneumonia, mortality