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بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

بعض الوثائق الأصلية تالفة

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بالرسالة صفحات
لم ترد بالأصل

Different Interpretation Approaches To Acid Base Disturbances

An Essay
Submitted For Partial Fulfillment Of Master Degree In Anesthesia
By

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M.B.B.CH

رسالة

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Introduction

The chemical composition of the extracellular and intracellular spaces is tightly controlled; this includes, but is not limited to, hydrogen and hydroxyl moieties. Alterations in the relative concentrations of these ions, widely described as disorders of acid-base chemistry, are associated with significant clinical problems. Consequently, the detection, interpretation, and treatment of acid-base abnormalities have become a core element of clinical care. Many clinicians struggle to understand acid-base chemistry because traditional educational approaches have focused on interpretation of laboratory data, rather than an understanding of underlying biophysical chemistry. The "modern" physical-chemical approach to acid-base balance has significantly enhanced understanding of these problems and simplified the clinical approach **[Neilgan & Deutschman, 2009].**

Almost a century ago, Henderson used an equilibrium theory of carbonate species to suggest a physiochemical approach to acid-base balance in human blood. Later, Hasselbalch provided a simple formula (the Henderson-Hasselbalch Equation) to describe those equilibria. Thereafter, Van Slyke realized the importance of noncarbonate buffers, principally hemoglobin and proteins, in the regulation of acid-base behavior. Siggaard-Anderson and others have developed the standard (base excess) model of acid-base balance in common use .Corey in 2003 claimed that this model is relatively easy to understand, simple mathematically, and relies on easy-to-measure variables**[Corey, 2003].**

At the heart of the physical–chemical approach to understanding acid–base is the fact that traditional approaches adapted from Henderson and Hasselbalch or those proposed by Siggaard-Andersen et al. are inadequate to understand mechanism of acid base disturbance **[Gunnerson a & Kellum , 2003].** Stewart, a Canadian physiologist, proposed a radically different approach to acid-base balance. He started by discarding many of the features of the traditional model, including the standard notions of acids and bases. Based upon the laws of mass action, the conservation of mass and the conservation of charge, he derived relatively complex mathematical formulas to describe acid-base balance, while introducing two new variables, the strong ion difference (SID) and the total weak acids (Atot) **[Corey, 2003].**

Recent advances in whole body acid–base physiology as well as epidemiology

have resulted in a much clearer picture of metabolic acid–base disturbances in the critically ill. It is now possible to 'unify' traditional descriptive approaches to acid–base balance with modern quantitative techniques. This unified approach is both simple and transparent and can be easily used at the bedside **[Kellum, 2005].**

Aim Of Work

- Understanding basic concept of pH and hydrogen ion activity
- Understanding different definitions of acidosis, alkalosis
- Development of traditional approach using combination of Handerson Haselbalch equation, the base excess and anion gap and its clinical application
- Development of Stewart approach , its mathematical concept and its clinical application
- Unification of acid–base physiology

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