(SGH) levels were determined at 25-minute intervals by a radioimmunoassay technique. Since SGH secretion is induced by various stimuli, the authors were interested to study the similarity between secretion patterns during prolonged anesthesia and those found during normal sleep. Every subject had significant, transient increases in SGH levels during the first hour after induction of anesthesia, again during the fifth hour, and finally, in the last hour of anesthesia. This is not apparent in the awake state when metabolic changes and stress are avoided. On the other hand, a burst of SGH secretion is seen after the onset of deep sleep, and the authors conclude that inhibition of neocortical activity is responsible for the increased secretion of SGH found in anesthetized subjects. (Werder, K., et al.: Growth Hormone Secretion during Long-term Anesthesia in Man. Horm. Metab. Res. 2: 309–310, 1970.)

Editor’s Comment: Although the significance of these findings is not immediately apparent, they indicate that the state of the art for quantifying endocrine function during anesthesia has come of age and an area devoid of data is ripe for study. The story must unfold eventually in the normal volunteer as well as the sick patient.

Respiration

IN-VIVO CO₂ EQUILIBRATION CURVE The authors have formulated a mathematical model to predict the effects of in-vivo steady-state changes of Pa₂CO₂ on plasma bicarbonate concentration and base excess as a function of blood volume (BV), packed cell volume (PCV) and interstitial fluid volume (IFV). Furthermore, the authors attempt to explain, through assistance from the model, the origin of the differences between the in-vitro and in-vivo CO₂ equilibration curves. In their opinion “CO₂ equilibration curve” is the best expression for defining the steady-state acid-base status of the blood after it has been exposed to an increase in P₅₆CO₂. “CO₂ titration curve” is considered misleading, since it implies an analogy to the classical titration curve in which a known amount of acid is added and the resultant pH is measured. “CO₂ absorption curve” describes total CO₂ (i.e., CO₂ content) taken by blood in vitro when P₅₆CO₂ is raised.

The in-vivo model was based on a three-compartment system: blood, interstitial fluid, and cells. The necessary values relating to buffering within these systems, obtained from the literature, were introduced into an equation developed to express the in-vivo quantitative behavior of the model, i.e., the rate of change of plasma HC₃⁻ with plasma pH. Analysis of the calculated data revealed the important effect of body composition (i.e., BV, PCV, and IFV) upon the slope of the in-vivo CO₂ equilibration curve. Thus, the expected steady-state change in acid-base status in acute hyperventilation depends not only on ventilation (P₅₆CO₂), but also on the volume of the several compartments of the body fluids into which HC₃⁻ can distribute. This is further complicated by the nonbicarbonate buffer capacity of the blood. The importance of this analysis lies in its demonstration that the clinical usefulness of existing data relating HC₃⁻ and Pa₂CO₂ for diagnostic purposes is sharply limited when there are concomitant disturbances in body composition. (Dell, R. B., and Winters, R. W.: A Model for the In Vivo CO₂ Equilibration Curve, Amer. J. Physiol 219: 37, 1970.)

OXYGEN TOXICITY IN MAN: A PROSPECTIVE STUDY In an excellent effort to elucidate the pulmonary effects of high inspired oxygen concentrations, these authors measured ventilatory variables in two comparable groups of patients who had undergone open-heart surgery. Alternate patients received either 100 per cent oxygen with IPPV or an oxygen concentration that kept arterial oxygen tension between 80 and 100 mm Hg. In the latter group of 20 patients, the highest oxygen concentration needed was 42 per cent. The mean times of exposure to these oxygen concentrations were 24 hours for the 100 per cent oxygen group and 21 hours for the “limited-oxygen” group. The investigators measured intrapulmonary right-to-left shunt, effective compliance, and the ratio of