Correction and compensation of acid-base imbalances

If ABR fails for any reason , the body begins to make efforts to maintain the pH of the indoor environment. In essence, ABR struggles with another disorder that deflects the pH in the opposite direction. We distinguish two groups of such mechanisms:

Compensation

It means that in the case of a metabolic disorder, the pH of the internal environment is maintained by changing respiration. For example, metabolic acidosis is compensated by respiratory alkalosis ; the patient will breathe hard deeply (" Kussmaull's breathing ").

Correction

- We only talk about correction in the case of ABR metabolic disorders: one metabolic deviation is corrected by another. E.g. a patient with liver failure (and therefore metabolic alkalosis) will excrete more bicarbonate in the kidneys and less acidify the urine.

The development of correction and compensation mechanisms takes some time. Respiration changes almost immediately after an ABR disorder occurs. Respiratory compensation mechanisms then deepen, reaching a maximum in about 12-24 hours. Compensation and correction at the kidney level are much slower - some transport mechanisms have to be re-regulated, which often requires protein synthesis. These mechanisms reach their maximum in five days.

When arriving at high altitudes, it is necessary to count on about five days of acclimatization. The cause of alpine disease is hyperventilation, which the body tries to deal with hypoxia. However, strenuous breathing does not improve the oxygen saturation of hemoglobin too much - the O 2 partial pressure in the surrounding atmosphere is too low for this , but it leads to respiratory alkalosis. It is alkalosis and ionic imbalance that is the cause of alpine disease, including brain swelling , lung swellingand tachycardia. Acclimatization consists in over-regulation of the kidneys - basically in the development of metabolic acidosis, which lasts the mentioned 5 days. It can be accelerated by the intake of large amounts of fluids, as it increases urinary bicarbonate losses. As part of the treatment of alpine disease, the administration of acetazolamide, a carbonic anhydrase inhibitor that reduces urinary acidification, is sometimes recommended (however, recent work considers the administration of acetazolamide to be ineffective).

Links

related articles

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- Principles of treatment of acid-base balance disorders
- Relationships between acid-base balance and ionogram