

# Chlorine imbalance

## Chlorine imbalance

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### Hypochloraemia

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Hypochloremia is  $\text{Cl}^- < 95 \text{ mmol / l}$ .

#### Pathogenesis

Hypochloraemia is not always just an expression of chlorine deficiency, ie it can be the result of dilution. The most common causes of hypochloraemia in intensive care are body fluid dilution ( hyperhydration , congestive heart failure ) and prolonged vomiting or aspiration of stomach contents. Hypochloraemia develops, followed by hypochloraemic metabolic alkalosis (MAL) , which stimulates the kidneys to increase potassium secretion . The result is dehydration with hypochloraemic MAL and hypokalemia . On the contrary, diarrhea mainly leads to water loss, sodium, potassium and bicarbonates with subsequent dehydration and hyperchloreaemic metabolic acidosis (MAC) .

Because electroneutrality adjustments in ABR disorders require reciprocal chlorine changes in bicarbonate changes, chloride administration is necessary to correct most MAL cases, whether or not accompanied by potassium deficiency. Administration of KCl or NaCl leads to rapid excretion of bicarbonates in the urine and treatment of alkalosis.

#### Etiology

**Insufficient chlorine intake.**  
**Excessive losses**

- renal;
- extrarenal: GIT, skin.

#### Some endocrine disorders

- diabetes mellitus ;
- m. Addison .

#### Indoor Environmental Disorders (MAL)

- congenital chloridorrhea ;
- Bartter's syndrome ;
- diuretic therapy ;
- cystic fibrosis .

#### Clinical picture

Chloride ion deficiency has no clinical manifestations of its own.

#### Diagnostics

When changing the concentration of sodium and potassium, we must look for changes in the concentration of chlorides. It is sometimes difficult to decide whether a change in serum chloride concentration is due to changes in sodium concentration during dehydration or as a result of a primary acid-base imbalance . The determination of the so-called *corrected chloride* can help . The formula for calculating this value is as follows:

$\text{Cl} - \text{corrected} = \text{Cl} - \text{measured} \times (\text{Na} + \text{reference} / \text{Na} + \text{measured})$

This value is in the range of 104 to 108 mmol / l.

A useful indicator is also the serum Na / Cl ratio , which does not change or decrease in primary Na disorders, while the Na / Cl ratio increases in primary Cl loss .

## Hypochloraemia therapy

We emphasize the elimination of the primary cause, usually 1/1 saline is sufficient.

## Hyperchloremia

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Hyperchloremia is  $\text{Cl} - > 105 \text{ mmol} / \text{l}$  .

### Pathogenesis

Hyperchloremia almost always accompanies the loss of sodium , water and bicarbonates and is associated with metabolic acidosis (MAC) . The opposite may be iatrogenic-induced hyperchloraemia with over-infusion of 1/1 saline.

### Etiology

- increased chloride intake (most commonly with sodium in NaCl infusion therapy );
- decreased chloride excretion usually together with decreased sodium excretion ( cardiac insufficiency , renal insufficiency );
- hyperchloremic acidosis without change in the overall chloride balance.

The finding of hyperchloraemic acidosis must always warn of the possibility of renal tubular acidosis and also occurs in diarrhea together with hypernatremia and hypokalaemia (water loss predominates).

### Clinical picture

Chloride excess has no clinical manifestations of its own.

### Therapy

Hyperchloremia is corrected by treating the underlying disorder, and the condition rarely requires a reduction in chlorine intake and increased excretion by diuretics .

## Links

### Source

- HAVRÁNEK, Jiří: *Dysbalance of chlorine* . (managed)

### related articles

- Sodium imbalance