



Hydrochloric acid

Introduction

Hydrochloric acid (HCl) assists protein digestion, renders the stomach sterile against orally ingested pathogens, prevents bacterial and fungal overgrowth of the small intestine, encourages the flow of bile and pancreatic enzymes, and facilitates the absorption of a variety of nutrients, including folic acid, ascorbic acid, beta-carotene, non-heme iron,

and some forms of calcium, magnesium, and zinc. Case reports suggest therapeutic potential as replacement therapy under circumstances of impaired HCl secretion in skin disorders, childhood asthma, B-vitamin deficiencies, anemia, and gastrointestinal disorders.

Historically, hydrochloric acid was prescribed for many symptoms and clinical conditions and was listed as a therapeutic intervention in various pharmacopoeias. However, beginning in the late 1920s and early 1930s, its common use by the medical establishment began to decline. The therapeutic efficacy of oral administration of HCl is still equivocal, largely due to a scarcity of outcome-focused clinical intervention studies; however, proponents suggest a therapeutic value of exogenous HCl supplementation in conditions associated with impaired HCl secretion.

Biochemistry and Mechanism of Action

HCl secretion is required for protein digestion by activating pepsinogen to pepsin. Food enters the stomach as chyme, stimulating the release of the hormone gastrin. The presence of gastrin in the blood stimulates the parietal cells of the stomach to release HCL, concentrated to a pH of 0.8. This high concentration of hydrogen ions requires a tremendous amount of energy to be formed (1,500 calories of energy per liter of gastric juice).

Deficiency States

Numerous signs and symptoms have been attributed to decreased HCl secretion, as well as several clinical conditions. While these symptoms, signs, and conditions may help identify patients with hypo- or achlorhydria, analysis with the Heidelberg pH capsule or other diagnostic testing should be used to confirm low stomach acid. Common symptoms of low gastric acidity

include bloating after eating, diarrhea, constipation, flatulence, heartburn, food allergies, and indigestion. Clinical conditions associated with low gastric acidity include, but are not limited to, anemia, arthritis, asthma, celiac disease, osteoporosis, various skin diseases, and flatulent dyspepsia. Numerous studies have also shown HCl secretion declines with age¹

Clinical Indications

Nutrient Absorption

In patients with histamine-fast achlorhydria, both ferric chloride and ferrous ascorbate were better absorbed when given with an acid solution. The acid solution did not alter absorption of hemoglobin iron.²

HCl appears to play an important role in the absorption of B-complex vitamins. Supplementation of HCl in conjunction with B-complex vitamins in functionally achlorhydric individuals improved patients' therapeutic response to B-vitamin therapy.³ A case report of an individual with a 17-year history of depression along with clinical signs and symptoms of B-vitamin deficiency that was refractory to B-vitamin therapy reported that adding HCl before meals to B-vitamin therapy resulted in rapid recovery.⁴ Evidence indicates folic acid absorption is enhanced in individuals with gastric atrophy when HCl is supplemented.⁵

Absorption of other nutrients such as zinc,⁶⁻⁸ calcium,⁹ ascorbic acid,¹⁰ and beta-carotene¹¹ is decreased under circumstances of impaired HCl secretion; however, studies have not been conducted on the impact of HCl replacement therapy on the absorption of these nutrients in subjects with inadequate HCl secretion.

Skin Diseases

In a series of 400 patients with skin disorders including acne rosacea, eczema, psoriasis, seborrheic dermatitis, urticaria, and vitiligo that were resistant to local treatment, a high prevalence were found to have impaired HCl secretion. An improvement in general health and skin condition was observed following replacement therapy with oral HCl and B complex (as brewer's yeast) in virtually all patients. Cases with moderate HCl deficiency showed the most rapid improvement.³

Other clinical case reports have suggested improvements in eczema and vitiligo subsequent to HCl administration in subjects with functional hypoacidity or achlorhydria.^{12,13}

Diabetic Neuritis

Case reports indicate diabetic patients with impaired HCl secretion and severe neuritis refractive to thiamine supplementation may experience marked improvement after receiving HCl supplementation.¹⁴

Asthma

One-hundred-and-sixty asthmatic children with low HCl levels avoided known food allergens and were supplemented with HCl before or during meals. An immediate improvement in appetite, weight, and sleep was observed. Asthma attacks were shorter in duration and of lesser intensity.¹⁵

Wright has commented on hypochlorhydria and low pepsin production resulting in incomplete digestion of food and macromolecule absorption, increasing both the number and severity of food allergies, while simultaneously impairing micronutrient nutrition. He also comments on the benefit of HCl administration as part of an integrated treatment protocol for childhood asthma.¹⁶

Anemia

Glutamic acid HCl was dosed at 5 grains three times daily before meals to 25 diabetic patients with blood cell counts of 4.2 million or less. Following treatment with glutamic acid HCl, the average red blood cell (RBC) count increased from 4.06 to 4.56 million. A subsequent combination of glutamic acid HCl with inorganic iron (ferrous carbonate 6 3/4 grains three times daily) increased RBC count to 4.85 million.¹⁴

Other Indications

Twenty-seven achlorhydric patients were supplemented with betaine HCl and pepsin for six months. General improvement in physical condition and strength was noted in all subjects. Indigestion and excessive gas were relieved in all patients with this complaint. Signs of oral mucosal inflammation improved in 78 percent of the patients, and of 22 patients with a complaint of a chronic sore mouth, five had complete relief and 11 others noted improvement.¹⁷

Administration of HCl between meals (but not with meals) to subjects with achlorhydria results in indican metabolism improving markedly; however, no change in urinary indican levels occurs in patients with normal gastric secretion following HCl supplementation, irrespective of when administered.¹⁸

Side Effects and Toxicity

It is recommended that HCl supplementation be avoided during periods of active peptic ulcer. Subjective sensations of heaviness in the chest, warmth, and occasionally pain or burning have been reported at high doses.

Dosage

Hydrochloric acid is available primarily as betaine HCl, although glutamic acid HCl is found in some formulas.

The potency of a capsule or tablet preparation may vary from 5-10 grains, with 1 grain equal to approximately 64.75 mg HCl. Clinically, practitioners have reported administering dosages of HCl from as little as 5 grains three times daily with meals to levels as high as 60-80 grains three times daily with meals in some patients. Other clinicians utilize a protocol where one capsule is given before, during, and after each meal.

If HCl is being administered for an individual with intestinal bacterial or fungal overgrowth due to lack of basal HCl production, it is recommended that one capsule of betaine HCl be supplemented three times daily between meals.

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