B-Ketothiolase Deficiency

What is B-ketothiolase deficiency?

It is one of the organic acid disorders due to a deficiency in of one of the enzymes that are involved in the catabolism of isoleucine. This enzyme is called B-ketothiolase or mitochondrial acetoacetyl Co-A thiolase which is also important in breaking down the ketonbodies. This leads to the accumulation of harmful substances in the blood.

What causes the disease?

Mutations in the *ACAT1* genes is a potential cause of the B-ketothiolase enzyme deficiency.

What are the clinical features of the disease?

Affected babies appear normal at birth. However, they are presented with symptoms after a few months of life with acute metabolic crises triggered by URTI and other catabolic states, which are characterized by tachypnoea and vomiting followed by dehydration and a falling level of consciousness. Investigations showed severe ketoacidosis. The presentation could be complicated by ataxia, dystonia basal ganglia lesions in brain MRI.

How is the diagnosis confirmed?

The diagnosis of B-ketothiolase deficiency is confirmed by finding a specific urine organic acid and plasma acylcarnitine profiles. DNA molecular testing of *ACAT1* gene may help also in confirming the diagnosis.

What is the treatment of the disease?

Patients with BKT deficiency should not be kept without food for extended periods of time.. Supplementation with carnitine may also be considered. A low protein and/or low fat diet is often recommended in children with BKT deficiency. In an acute symptomatic episode, IV glucose and fluids are given. A Biochemical genetics specialist and a Metabolic Genetics dietitian should coordinate the treatment.