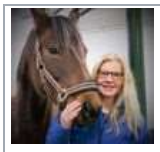
Votion 2023 MiP2023



Serum acylcarnitines profile for diagnosis, prognosis and monitoring therapeutic intervention in equine atypical myopathy.

Link: MiP2023 Obergurgl AT

Votion Dominique-Marie (2023)

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Acer pseudoplatanus contains toxins responsible for poisoning in various species [1], including humans [2]. In equids, this intoxication induces an often fatal rhabdomyolysis syndrome known as atypical myopathy (AM); [3]. Blood analysis reveals a severe metabolic disturbance characterised by hyperglycaemia, high triglycerides, and lipid intermediates [4].
Toxins inhibit several steps of the fatty acid β-oxidation cycle that leads to the accumulation of acyl-CoAs in the mitochondria, which are scavenged into acylcarnitines. Also, competitive inhibition of long-chain fatty acid transport into mitochondria results into their accumulation conjugated with carnitine. In addition, inhibition of the catabolic pathway of branched-chain amino acids, particularly leucine, leads to the accumulation of branched acylcarnitines [2; 5].
Acylcarnitines in tissues may explain parts of the pathophysiological process, such as the cardiac myopathy occurring in AM. Also, acylcarnitines accumulation could promote muscle insulin resistance and contribute to the hyperglycaemia observed in AM horses [4].
The disease also results from severe impairment of mitochondrial bioenergetics [6; 7]. In AM, the serum acylcarnitines profile contributes to the diagnosis of the disease, its prognosis and is also a valuable aid in monitoring ongoing metabolic disturbances.
In search of new therapeutic approaches for this environmental intoxication, we are currently designing toxicity assays with cultured cells [7] and zebrafish larvae. These models will help us to test different drugs by exploring their ability to prevent metabolic disturbances as indicated by the acylcarnitines profile. Indeed, in both models, the alteration of the acylcarnitine profile can be followed.

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• *Keywords:* environment, myopathy, toxins, β-oxidation, acylcarnitines

• *O2k-Network Lab:* BE Liege Votion DM

Affiliation

Votion Dominique-Marie

Dept. of Functional Sciences, Faculty of veterinary Medicine, ULiège, Liège, Belgium

Corresponding author: Dominique.votion@ULiege.be

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