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Early diagnosis of acid sphingomyelinase deficiency (ASMD) through biomarkers analysis

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Introduction: Acid sphingomyelinase deficiency (ASMD), historically known as Niemann–Pick disease (NPD) types A, A/B, and B, is a rare, progressive, potentially fatal lysosomal storage disease caused by pathogenic variants in SMPD1 gene. It presents a wide spectrum of symptoms, age of onset, and degree and type of organ effected.
The disease manifestations frequently involve hepatosplenomegaly with progressive organ dysfunction, interstitial lung disease, and bleeding.
In this work, we will present a patient whose lysosomal biomarkers study allowed the diagnosis of ASMD.

Methods: This patient had hepatosplenomegaly, elevated transaminases in which the primary clinical suspicion was an acid lipase deficiency. By the analysis of our multiplex biomarker panel by LC-MS/MS analysis, we were able to do a differential diagnosis.

Results/Case report: The lysosphingomyelin (lysoSM) and lysosphingomyelin-509 (lysoSm-509) were approximately 100 a 150x than normal, suggestive of Niemann–Pick disease. The diagnosis of ASMD was confirmed by reduced acid sphingomyelinase enzyme activity measured in peripheral blood leukocytes and the presence of a pathogenic variant in both alleles in the SMPD1 gene.

Conclusion: ASMD can be underestimate and the diagnostic odissey arise from an overlap in symptomology with other diseases, including primary hepatic disease, Gaucher disease, Niemann–Pick disease, and lysosomal acid lipase deficiency.
The multiplex biomarker panel, with different lysolipids, allows simultaneously diagnosis of different LSDs, in a timely manner, leading to an early intervention, before the appearance of more deleterious symtpoms.