

Conference Series LLC Joint International Event on

7th Pharmacovigilance & Pharmaceutical Industry

August 22-24, 2016 Vienna, Austria

Is Carnitine deficiency: The cause of higher ammonia levels in patients under Valproic acid treatment and in the elderly

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Higher ammonia levels have been associated with valproic treatment, some central nervous system pathologies and age. Serum carnitine and/or acetylcarnitine depletion have been postulated in the literature as possible causes. To analyze if this deficiency could result in increased ammonia levels three groups of patients were studied: A) epileptic under phenytoin treatment; B) with bipolar disorder under Valproic acid treatment; C) elderly. Plasma Valproic acid concentration (Group B), blood carnitine and acyl carnitine profiles, and ammonia blood concentrations in the three groups were determined. Patients in Groups B and C showed significant higher levels of ammonia than in Group A. Patients in Group B and with hyperammonemia presented significant lower acetylcarnitine levels and a trend towards lower carnitine levels than in Group A. Patients in Group B with normal values of ammonia presented significant higher values of both carnitine and acetylcarnitine than Group A. While mean carnitine levels in the elderly were significantly higher than in younger adults, mean acetylcarnitine levels were significantly lower. In patients treated with Valproic acid, carnitine depletion followed by acetylcarnitine decrease could be responsible for the increase in the ammonia levels. In the elderly population, serum carnitine was probably increased due to impaired access to tissues which in turn resulted in acetylcarnitine decrease. This last fact could lead to ammonia impaired elimination. Exogenous administration of acetylcarnitine could be a promising agent to reverse higher ammonia levels.

Biography

Cecilia Maldonado has completed her PhD on Efflux Transporters and its Relationship to Anticonvulsants Therapeutics. She is Assistant Professor at the Pharmaceutical Sciences Department in the Faculty of Chemistry, Uruguay and a researcher at the University Hospital in the Therapeutic Drug Monitoring Service. She has published more than 15 papers in reputed journals and was awarded the Grant for Professional Innovation from the International Pharmaceutical Federation (FIP) in 2013.

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