Application of Lipid Emulsion for Neurological Disease

Kane PC, Wnorowski TM, Kane E, Speight MO
NeuroLipid Research Foundation
New Jersey, USA

Background: The lipid soluble nature of neurotoxicity has led us to seize the complexity of neurological presentations by addressing them from a cell membrane perspective. Examination of red cell lipids at Johns Hopkins Peroxisomal Diseases Laboratory in subjects with Motor Neuron Disease, Autism, Multiple Sclerosis, Post Stroke, Epilepsy, Alzheimer's and Parkinson's Disease over the past eleven years in 9000 analyses has revealed a characteristic accumulation of very long chain fatty acids (VLCFAs), which comprise lipid rafts, or ceramides, revealing cell membrane derangement. Membrane phospholipid abnormalities with elevation of VLCFAs may be indicative of exposure to fat soluble neurotoxins resulting in suppressed peroxisomal beta oxidation of VLCFAs. Disturbances in methylation due to toxic exposure may destabilize the membrane phospholipid dynamics and alter DNA expression due to deficits in the enzymes Methylene Tetrahydrofolate Reductase (MTHFR) and Methionine Synthase.

Objective:. The use of oral and IV lipids and methylation factors may facilitate stabilization of phospholipids in cellular membranes thereby addressing cell membrane integrity. The addition of intravenous phenylbutrate addresses neuroinflammation by increasing the beta oxidation of VLCFAs.

Procedure: To clear the bioaccumulation of neurotoxins and stabilize membrane function we have embarked on a clinical treatment plan for the past five years to address the accumulation of aberrant lipids and ceramides with oral and IV phenylbutyrate, bolus intravenous phosphatidylcholine as Lipostabil, methylation factors (folinic acid, riboflavin, methylcobalamin, tetrahydrobiopterin), and sulfation support (intravenous Glutathione).

Results: We have noted significant and sustained clinical neurological improvement within the first few weeks after initiation of oral and intravenous treatment in our patient population of 300 subjects.

Conclusion: The intravenous administration of Phosphatidylcholine, Folinic acid, Glutathione and Phenylbutyrate may offer a new therapeutic strategy for neurological disorders involving neurotoxic exposure.