Oral synthetic ketone ester can affect normal body weight gain in young rats

Perrotta M1*, Buonomo B1*, Cascino G1*, Infante R1*, Pilla R2, Viggiano A1 and Coppola G1,3

1Faculty of Medicine and Surgery, University of Salerno; Salerno; Italy
2Dept. Molecular Pharmacology and Physiology, University of South Florida; Tampa; Florida; USA
3Child and Adolescent Neuropsychiatry; University Hospital “S. Giovanni Di Dio e Ruggi D’Aragona”; Salerno; Italy
*These authors contributed equally to the work

Ketogenic diets (KD) elevate blood ketones and are successfully used to treat drug-resistant epilepsies. Because it is difficult for patients to adhere to this kind of diets, it is of great interest to find possible pharmacological alternatives reproducing a KD-like condition. To this end, in the present study it was evaluated the safety and tolerability of the chronic administration of the synthetic ketone ester R,S-1,3-butanediol acetoacetate diester (BD-AcAc2).

Two groups of rats were given an intragastric dose (by gavage) of BD-AcAc2 (group 1) or water (group 2) for ten days. For each rat it was recorded: weight, blood glucose level and β-ketonemia, along with positional sense test, righting reflex test, gait and stance test, muscle tone, equilibrium.

The results showed that the treatment with BD-AcAc2 blocked the normal growth in body weight and caused a light but significant increase in β-ketonemia; blood glucose level and other neurological functions were not affected by the treatment.

This result is in keeping with previous works and further supports that the chronic administration of ketone esters can be a safe and simple method to elevate blood ketone levels. Further studies are of course needed to improve our knowledge of the nutritional adverse effects as well as the overall tolerability of ketone ester oral treatment.