Perinatal Protein Restriction May Induce Mitochondrial Dysfunction in Liver of Young Rats


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During the critical period of development, the body can be influenced by external factors, such as malnutrition, and may induce biochemical changes in tissues. Thus our aim was evaluate the effects of protein restriction in the liver mitochondrial bioenergetics. Male Wistar rats were divided according to the mother's diet. Control group (17% casein), and low protein (LP) group (8% casein). After lactation (21 days), pups began receiving Labina. At 30 days of age the animals were sacrificed and the liver mitochondria isolated by differential centrifugation. We evaluate mitochondrial respiratory rates parameters (phosphorylating (State 3), resting (State 4) and uncoupled state) and reactive oxygen species (ROS) production (Amplex-Red and H₂DCF-DA). Our results showed a significant decrease of the state 3 (29%), increase of the state 4 (28%) and decrease in uncoupled state (22%), with decrease (39%) of the respiratory control rate (RCR) in LP group when compared to control group. Furthermore, the LP group showed a significant increase on ROS production (3 fold) sensitive to EGTA (calcium quelator). Our data suggest that protein restriction during critic period of development induce alteration in mitochondrial bioenergetics in a way that decrease the RCR and stimulate the mitochondrial ROS production in young rats.

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