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Changes of serum phospholipid fractions during a body weight reduction program (BWRP) in obese ponies

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Phospholipids (PL) are important structural elements and involved in several signal transductions including insulin signaling. Changes in the distribution of PL fractions may therefore affect insulin receptor function and signaling. Therefore, the aim of the present study was to investigate the concentration of serum PLs and the distribution of PL fractions before and after a body weight reduction program (BWRP) in obese ponies and to analyze its association with insulin resistance (IR). Phospholipids were analyzed by high performance thin layer chromatography (HPTLC) in serum of sixteen mature obese ponies, aged 3-20 years, before and after 14 weeks of BWRP. Seven of 15 obese ponies had IR at the beginning of BWRP. Concentrations of phosphatidylcholine, lysophosphatidylcholine, sphingomyelin, phosphatidylethanolamine and phosphatidylserine were quantified densitometrically after separation. The 14-week BWRP resulted in an average weight loss of $14.1 \pm 3.64\%$, which was accompanied by an increase of serum sphingomyelin ($p < 0.001$). The other PL classes were unchanged during BWRP. Seven out of 15 obese ponies still had IR after BWRP and 9 out of 15 obese ponies had improved insulin sensitivity. Significantly higher concentration of sphingomyelin was found in serum of insulin sensitive ponies after BWRP ($p < 0.01$). The findings suggest that sphingomyelin plays an important role as a precursor in sphingolipid signaling pathway and thus in the development and pathogenesis of IR and the progression of metabolic syndrome in obese ponies.

Biography

Ratchada Auyyuenyong has been receiving a scholarship from the Royal Thai Government as a PhD candidate at the University of Potsdam, Germany. She is the Lecturer of Ubon Ratchathani Rajabhat University, Thailand. She is interested in disturbances of lipid metabolism and-related diseases.

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