

Physical activity and sport performance: adiponectin in relation to different physio-pathological status

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Adiponectin (Acrp30), and in particular its High Molecular Weight (HMW) oligomers, contributes to enhance insulin sensitivity and to reduce inflammation levels. Physical exercise improves body's biochemical balance and metabolism resulting effective in the prevention and therapy of metabolic diseases. Whether improvement of metabolic features mediated by physical exercise is associated with changes in Acrp30 serum composition is not yet clarified.

In the present study, we investigated total Acrp30 expression and its oligomeric status in two different metabolic status: professional Water Polo (WP) Players and adult patients affected by Cystic Fibrosis (CF) that performed regular physical exercise. CF is an inherited metabolic disease characterized by alterations in lipid and glucidic metabolism. Our results demonstrated significant elevated BMI, AST and LDH levels and, conversely, significantly lower concentrations of total cholesterol and VLD were present in WP players. No significant difference was found in total Acrp30 and/or HMW oligomers. Interestingly, in WP players, a direct relationship between total Acrp30 and monocytes as well as an inverse relationship between total Acrp30 and AST levels were found. ACDC molecular screening revealed previously described SNPs.

In CF patients, physical exercise has significant effects on lipid and glycemic metabolism. Indeed, patients that performed exercise are characterized by significant decrease of either VLDL, cholesterol and triglycerides, border-line significant decrease of either total cholesterol/HDL and non-HDL cholesterol/HDL ratio and by trend decrease of total, LDL and non-HDL cholesterol, although not significant. It's to highlight that physical exercise significantly reduces glycemia and HOMA-IR and increases serum albumin. However, physical exercise does not modify Acrp30 concentrations that, on the other hand, result significantly higher in all CF patients compared to controls. In conclusion, even if peripheral muscle abnormalities and respiratory factors limit exercise in patients with CF, our study indicated that physical activity has beneficial effects on lipid and glycemic metabolism in these patients not associated with Acrp30.