

SUMMARY

Péter Fülöp, MD, PhD: A clinician's journey on obesity

Obesity and its co-morbidities including fatty liver disease, insulin resistance and cardiovascular diseases are major health problems worldwide. Fatty liver may result in significant morbidity and it is also considered to be more susceptible to acute injury.

Uncoupling protein-2 (UCP2) is an inner mitochondrial membrane carrier with various biological functions and its expression is highly increased in the lipid-laden liver. By tapping into the proton gradient, the impact of activated UCP2 on ROS generation and ATP production may either be beneficial or harmful in fatty liver disease. Our experiments on leptin-deficient obese mice revealed cell-specific alterations of UCP2 expression in the liver of these rodents, which may explain the increased vulnerability of the steatotic liver to acute injury.

Reports on obese individuals also indicated that nutrient excess and metabolic syndrome are linked with altered immune response. Indeed, metabolic syndrome is characterized by insulin resistance and chronic low-grade inflammation, which conditions are the consequences of the complex interactions between adipocytes and immune cells. Due to its special architecture in which metabolic and immune cells are in intimate proximity, metabolic and immunological pathways are closely integrated in white adipose tissue (WAT), which is no longer considered to be a mere energy depository tissue but rather a biologically active endocrine and immune organ secreting various substances named adipo(cyto)kines. Regulating a plethora of processes including hunger/satiety, insulin sensitivity, inflammation and oxidative stress, altered secretion of adipokines and their imbalance may result in later metabolic and cardiovascular complications. Our research group now focuses on mapping associations between adipokines and markers of metabolic, immunological, or oxidant status in obesity to find out whether WAT-related adipokines can be used as cardiovascular biomarkers that indicate cardiovascular outcomes.